THE PALEOINDIAN COLONIZATION OF EASTERN NORTH AMERICA: A VIEW FROM THE SOUTHEASTERN UNITED STATES

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INTRODUCTION

This essay examines existing views on the initial colonization and settlement of eastern North America and offers a time-transgressive model explaining how the process may have occurred. While most of the data used are from the southeastern United States, the primary topic under investigation is the settlement of the larger region, the Eastern Woodlands. To properly evaluate the Paleoindian archaeological record from the Southeast, a region-wide and even continent-wide perspective is essential, requiring consideration and analysis of materials from a large area. Such an approach appears to be comparatively uncommon. Although the Paleoindian colonization of North America has been the subject of considerable research and speculation over the past half century, the actual archaeological evidence for initial settlement has only rarely been examined from a holistic perspective. This is particularly true in the Eastern Woodlands, where synthetic

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analyses employing region-wide data sets have only infrequently appeared (e.g., Mason 1962, Meltzer 1988, Williams & Stoltman 1965). As a result, many of the currently held views on Paleoindian settlement and land use are based on samples from comparatively small areas or incorporate assumptions about the Paleoindian archaeological record that may not be correct for the entire region. Inspection of the overall record reveals patterns that call into question both traditional and current models of Paleoindian colonization and subsequent land use.

A fundamental assumption of the colonization model presented in this essay is that successful human settlement of the continental United States and portions of southern Canada occurred around or just after 12,000 BP. Although this assumption is controversial, it appears to be supported by available evidence (see Dincauze 1984, Owen 1984, Haynes 1987, Meltzer 1989). No pre-Clovis human populations are assumed to have been present in North America at the time of the Clovis radiation. If earlier human populations entered the region, they are assumed to have either quickly passed through it into Central and South America or, if they remained, to have soon died out. The demographic, economic, and cultural evolutionary processes described here are predicated upon human founding populations having successfully reacted to an empty social landscape. Following Isaac (1988:3), processes of production, consumption, distribution, and exchange during the Early Paleoindian period are examined in an effort to resolve the economic, ecological, and demographic factors that shaped the initial colonization of Eastern North America.

THE NATURE OF THE REGIONAL DATA BASE

Chronological Considerations

The first unequivocal evidence for human occupation in the southeastern United States dates to around 11,500 BP, during the Paleoindian period, when assemblages characterized by fluted lanceolate projectile points appear widely over the region. Paleoindian components in the lower Southeast in recent years have been provisionally grouped into three broad temporal categories, corresponding to Early, Middle, and Late or Transitional Paleoindian periods (Anderson et al. 1987, n.d.; O'Steen et al. 1986:9) (Figure 1). The first subperiod, the Early Paleoindian, is thought to date from ca. 11,500 to 11,000 BP and is characterized by fluted points similar to the classic southwestern Clovis forms. The points are relatively large lanceolates with nearly parallel ground haft margins, slightly concave bases, and single or multiple flutes that rarely extend more than a third of the way up the body. The second subperiod, the Middle Paleoindian, is thought to date from ca. 11,000 to 10,500 BP, and is characterized by a range of larger and smaller fluted points and by fluted or unfluted

points with broad blades and constricted haft elements. Identifiable forms include the Cumberland, Redstone, Suwannee, and Simpson types. The third subperiod, the Late Paleoindian, dates from ca. 10,500 to 9900 BP, and is characterized by Dalton points (Morse 1971, 1973; Goodyear 1974, 1982:390). These points have a lanceolate blade outline, at least in the earliest stages of tool life, and a concave base and side (approaching side notches on some specimens) that is usually well-thinned and ground on the lateral and basal margins.

While this tripartite southeastern Paleoindian sequence is generally accepted, its details remain to be confirmed through stratigraphic excavations and absolute dating. Although there is a general consensus that the large "classic" Clovis lanceolates precede the more waisted or eared fluted or nonfluted forms in the region (Gardner 1974:18; Garnder & Verry 1979, Goodyear et al. 1979:90–96, McGahey 1987:7–8, Morse & Morse 1983:60–65, O'Steen et al. 1986:9), the temporal range, ordering, and extent of co-occurrence of these forms remains to be worked out (see, e.g., commentary by Griffin 1977:5 and Meltzer 1988:15). The three periods are assumed to equate with human populations initially colonizing and exploring the region (Early Paleoindian), settling in and establishing regional population concentrations and cultural variants (Middle Paleoindian) and, finally, making the switch to Holocene conditions and an Archaic way of life (Late Paleoindian).

Surface Finds

Early and Middle Paleoindian fluted points have been found in surface context throughout the Eastern Woodlands. Since the late 1940s, fluted point surveys have been initiated in almost every state and province in eastern North America, and a high level of amateur and professional interaction centers around this effort. Among the best documented fluted point surveys are those from Ohio and Virginia, which were among the first established. (See McCary 1984, Prufer & Baby 1963, and Seeman & Prufer 1982 for good overviews of fluted point research in these states.) The reasons for recording information about Paleoindian points are obvious. Fluted and other lanceolate projectile points are currently the only artifacts known to be unambiguous diagnostic indicators of sites of this period. Information about their occurrences is, thus, the only way—short of excavation and the use of absolute dating procedures—that these early occupations can be recognized. Fluted point locations tell us where Paleoindian peoples lived, that is, which spots on the landscape were important to them, and how they made use of these areas. Studies of point styles and raw materials, furthermore, provide clues about how far these people may have traveled over the course of the year and whether or not they were linked or related to groups in other areas. Finally, systematically recording these artifacts brings about continual refinement of our ideas about Paleoindian occupation in the region and, in the process, helps to dispel earlier views and (mis)conceptions.

Examples of fluted point recording projects in the Eastern Woodlands include the massive compilation conducted by the Eastern States Archaeological Federation (Brennan 1982). In that study, which was published in 1982, 5,820 Paleoindian projectile points were reported from 17 states and 2 Canadian provinces located primarily along the Atlantic seaboard. Unfortunately, while many states or provinces have reported high Paleoindian point totals, information on measurements, raw material type, and proveniences of individual artifacts in many cases is either nonexistent or accessible only with great difficulty. While notable exceptions to this general pattern exist, there is a very real need for investigators to publish primary data, specifically artifact proveniences, measurements, drawings and, where possible, photographs. Studies leading to published compilations of data are critically important to eastern Paleoindian research because the information can be used to examine a wide range of questions.

In the Southeast, statewide fluted point surveys with published primary data for individual artifacts exist for Georgia (Anderson et al. 1986, 1990, n.d.), Kentucky (Rolingson 1964, Tankersley 1989), North Carolina (Perkinson, 1971, 1973), and Virginia (McCary 1984). Comparable projects recording primary artifactual data are ongoing in Florida (Dunbar & Waller 1983), Louisiana (Gagliano & Gregory 1965, Spiller 1987), Mississippi (McGahey 1987), South Carolina (Michie 1977; Charles 1983, 1986), and Tennessee (Guthe 1983, Broster 1989), although the information gathered remains unpublished in these cases. Southeastern states where general fluted point survey data exist, that is, where point totals have been presented, but where individual artifactual data have not been systematically recorded, include Alabama (Futato 1982) and Arkansas (Morse & Morse 1983:6–61).

Many of the fluted point recording projects in the Eastern Woodlands are ongoing. The oldest continuous survey in the Southeast, which has served as the model for the region, is from Virginia and was initiated by McCary in the late 1940s (McCary 1984, 1988). Over 800 fluted points have been recorded by the Virginia survey, and all of the data through 1984 have been presented in a summary volume (McCary 1984, 1988). The Virginia data, without question, form the best Paleoindian statewide fluted point sample from anywhere in the United States. The work by McCary, an avocational archaeologist, illustrates the positive and lasting contributions that can come from interaction between avocational and professional archaeologists (Hranicky 1989). Work in other states has also been proceeding rapidly. Since 1980, for example, data on over 200 new Early and Middle Paleoindian points have been reported in South Carolina, and the total number of points now known for that state stands at over 300 (Charles 1986:16). In Mississippi, data on close to 600 Early, Middle, and Late Paleoindian points have been recorded since 1968 (McGahey 1987:1). In Georgia, one of the last eastern states to initiate a fluted point survey, over 100 Early and Middle Paleoindian points have been recorded since 1986, when the project began (Anderson et al. 1987, 1990).

Traditionally, fluted point distributions from the Eastern Woodlands, particularly the widespread occurrence of isolated finds, have been used to suggest that Paleoindian occupations in most areas were fairly uncomplicated and of short duration. Regional settlement, in this view, was characterized by small groups of highly-mobile foragers and part-time big game hunters who, over the course of their wanderings, visited most portions of the region. Movement was so frequent and over such a great area that only rarely and typically at quarries were large quantities of artifactual debris left behind. This inferred pattern is so different from that observed in the Great Plains and in the Northeast, where dense kill or habitation loci have been reported, that some investigators have suggested that southeastern Paleoindian populations were highly-mobile, generalized foragers only rarely "participating in the highly structured spatial behavior that produces sites" (Meltzer 1984:354; see also Meltzer 1988:14). The low incidence of Paleoindian occupation sites across much of the region has been variously attributed to an uneven occurrence of high-quality cryptocrystalline resources (Gardner 1983; Goodyear et al. 1985, 1989), survey bias favoring open as opposed to wooded areas (Lepper 1983), settlement systems favoring the resources of since-submerged portions of the coastal plain (Goodyear et al. 1983), and the small size of many southeastern river basins, particularly those removed from the major arteries extending well into the midcontinent, such as the Tennessee and Ohio river valleys (Williams & Stoltman 1965).

At present over 9,000 fluted and nonfluted Early and Middle Paleoindian projectile points have been identified from the Eastern Woodlands, including over 5,000 from the Southeast, defined here as the region south of the Arkansas-Missouri line and the Ohio River (Table 1). Using the county-level provenience data available from the fluted point surveys or other sources as referenced in Table 1, it is possible to plot the occurrence of these artifacts across the region (Figure 2). These data, it should be noted, represent artifact totals, that is, points from both recognizable sites and isolated finds in each county. While the resulting figure is impressive, some very real limitations with its constituent data must be acknowledged. In some surveys, counts of "fluted points" included late stage preforms or artifacts broken in manufacture, while in other surveys apparently only finished forms were included. In some states, furthermore, both fluted Early Paleoindian and fluted and unfluted Middle or even later Paleoindian forms were included in the surveys. Most of the fluted points reported from the extreme northeast, encompassing the New England states and Nova Scotia, for example, appear to be Middle or even Late Paleoindian in age (Gramly 1983, MacDonald 1968; see also Haynes 1987, Meltzer 1988). While the incidence of fluted points in this region was plotted in Figure 2, the presumed late age of these forms must be noted. Every effort was made to control for this bias, in an attempt to accurately portray the occurrence of Early Paleoindian materials over the region.

Where a clear distinction was evident in the definition (as well as the occurrence and numbers) of Early and Middle Paleoindian diagnostics—as in the case of Florida, where most "fluted" points are actually unfluted Suwannees or

Table 1. Fluted Projectile Points in Eastern North America: Total Counts by State or Province

Province or State[a]	*Number of Fluted Points*[b]		*Data Sources*
Alabama*	1654	SE	Futato 1982:30
Arkansas	102	SE	Dan F. Morse 1989: pers. comm.
Connecticut*	17		Moeller 1982:41
Delaware*	55		Griffith 1982:37
Florida**	1296	SE	Dunbar & Waller 1983:19; James S. Dunbar 1989: pers. comm.
Georgia	126	SE	Anderson et al. 1986, 1990
Illinois	150		Brad Koldenhoff 1983, 1989: pers. comm.; Winters 1962
Indiana	195		Dorwin 1966; Kenneth B. Tankersley 1989: pers. comm.
Kentucky	276	SE	Rolingson 1964; Kenneth B. Tankersley 1989: pers. comm.
Louisiana*	49	SE	Meltzer 1988:12; Philip G. Rivet 1989: pers. comm.
Maine*	100		Sanger 1982:43–45
Maryland*	100		Brennan 1982:35; Tyler Bastian 1989: pers. comm.
Massachusetts*	420		Grimes & Bradey 1982:41
Michigan	124		Lepper 1986a; Henry T. Wright 1989: pers. comm.
Missouri*	280		Chapman 1975:67
Mississippi	68	SE	McGahey 1987:11
New Hampshire*	10		Sargent 1982:43
New Jersey*	280		Kraft et al. 1982:37–38
New York*	300		Wellman 1982:39–40
North Carolina*	409	SE	Peck 1988:5
Nova Scotia*	140		Brennan 1982:45
Ohio	893		Meltzer 1988:12; Seeman & Prufer 1982; Lepper 1986c
Ontario*	306		Storck 1983; Jackson 1983
Pennsylvania*	262		Kent 1982:38–39
Rhode Island*	4		Turnbaugh 1982:41–42
South Carolina*	341	SE	Michie 1977, Charles 1986
Tennessee*	358	SE	John B. Broster 1989: pers. comm.
Vermont*	32		Loring 1980, Basa 1982:42–43
Virginia*	824	SE	McCary 1984, 1986, 1987, 1988
Washington, D.C.	3		Meltzer 1988:12
West Virginia*	79		Lepper 1983:282; Gardner n.d.
TOTAL	9253		
SE	5503	(59.47%)	

[a] *Totals include at least some post-Early Paleoindian diagnostics.
**Total includes 537 for which type and country data were available.
[b] The letters SE following the number mean that these points were from the Southeast as defined in this essay.

Simpsons (see Purdy 1983, Dunbar et al. 1988:451)—data on the occurrence of true Clovis forms was used when this information could be obtained. In several states where both Early and Middle Paleoindian diagnostics were included in survey records, as in Georgia, South Carolina, and Mississippi, for example, precise counts for Early Paleoindian forms were available. For states where *only* Early Paleoindian forms were recorded, as in Arkansas, this was not a problem

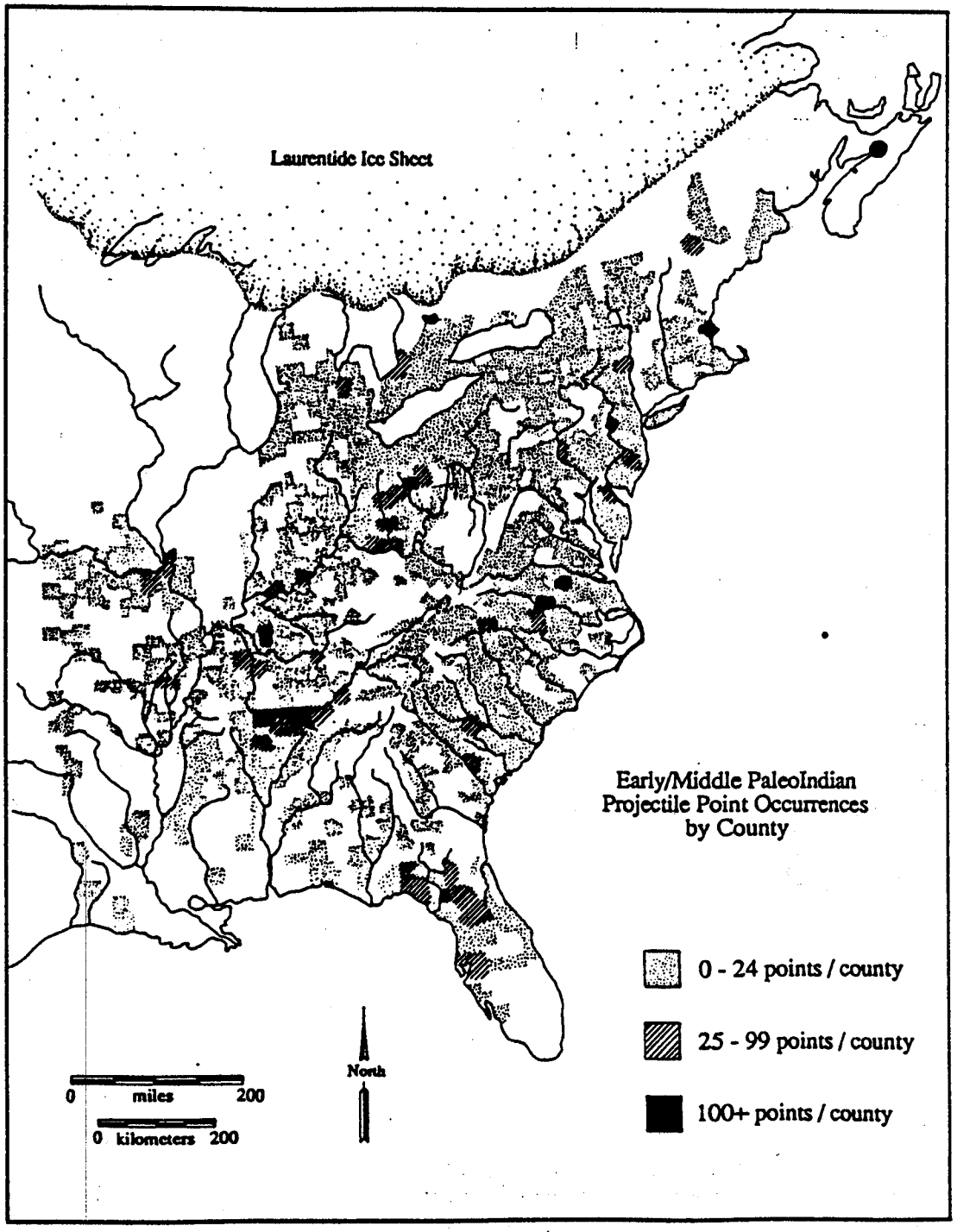

Figure 2. Early and Middle Paleoindian (ca. 11,500–11,000 BP) Fluted Projectile Point Concentrations in Eastern North America

of course. In three states, Illinois, Louisiana, and West Virginia, Paleoindian data recorded at the county level were available for only portions of the states. The artifact distributions illustrated in Figure 2 for these states thus encompass only areas for which data were available (as referenced in Table 1). Finally, it should be noted that large areas of the continental shelf that were exposed and habitable during Paleoindian times are now submerged, rendering interpretations about settlement in these areas difficult (Loring 1980). Figure 2 thus summarizes Early Paleoindian distributions perhaps as well as they can be summarized at the present. Refinement of this map is inevitable, of course, as more primary data become available from the region.

One thing immediately evident is that low numbers of Early Paleoindian points occur across much of the region, supporting observations that these artifacts frequently occur as isolated finds or in low numbers on individual sites (Meltzer 1988:11–14). More striking, however, is the fact that pronounced concentrations occur in some areas while other areas are characterized by a complete or near-complete absence of these forms. Although Paleoindian points are assumed to occur widely over the region, the distributional data demonstrate that these artifacts actually exhibit a highly varied distribution, being quite common in some areas and quite rare in other areas. These patterns are so geographically extensive as to preclude suggestions that they are entirely or largely due to cropping or collecting practices (see Lepper 1983, 1985; Seeman & Prufer 1984). While these factors are admittedly operating, the low incidence of Early Paleoindian artifacts in areas that are both heavily farmed and collected, as in large areas of the Gulf coastal plain, suggests that prehistoric rather than contemporary phenomenon are represented.

Major portions of the southeastern landscape appear to have been unoccupied or were only minimally visited by Early Paleoindian populations. Much of the Gulf coastal plain, portions of the Atlantic coastal plain, and part of lower peninsular Florida, in fact, do not appear to have been settled until later, in the Late Paleoindian or Early Archaic periods (Figure 2). In addition to these unoccupied/minimally occupied zones, pronounced concentrations of Early Paleoindian artifacts and sites are also evident in some parts of the Eastern Woodlands, in marked contrast with the general pattern of low site/artifact incidence. Major concentrations of Early Paleoindian diagnostics are present in the central Tennessee, Cumberland, and Ohio river valleys and along portions of the Atlantic seaboard, notably in western South Carolina, southern Virginia and north-central North Carolina, and in New Jersey and eastern Pennsylvania. These areas, I suggest, were loci of initial colonization, staging areas from which the settlement of the larger region proceeded.

The information collected during fluted point survey projects is also refining our understanding of Paleoindian occupation within specific localities. The survey data from South Carolina and Georgia, for example, indicate that Early and Middle Paleoindian points occur along both major and minor drainages in

this part of the Southeast, a finding necessitating some revision of earlier observations that these artifacts occurred primarily along the major rivers (cf. Anderson 1988:100–104, Charles 1986:16, Goodyear et al. 1989, Michie 1977, O'Steen et al. 1986:45–51, Williams & Stoltman 1965:676). Examining the occurrence of these artifacts by raw material, the Georgia and South Carolina data additionally suggest that local Paleoindian groups carried or exchanged points up to 250 km from their sources, reinforcing inferences that the adaptation was indeed geographically extensive, an observation often made but seldom documented in the eastern literature.

In addition to fluted point surveys, which focus on points dating to what are here called the Early and Middle Paleoindian periods, considerable attention has been directed to the recording of later Paleoindian diagnostics in the Southeast in recent years, particularly Middle Paleoindian nonfluted lanceolates such as the Suwannee and Simpson types, and Late Paleoindian Daltons. These later, nonfluted forms exhibit considerable stylistic variability and many have restricted distributions, something that has been interpreted as evidence for increasing regionalization or isolation of groups as population levels rose, mobility decreased, and pan-regional interaction declined. Examples of localized, presumedly later Paleoindian variants include the Cumberland tradition centered on Kentucky and Tennessee, the Suwannee tradition of Florida and adjoining areas, and the various Dalton variants recognized over the region (Dunbar & Waller 1983; Ensor 1987; Goodyear et al. 1983; Meltzer 1984, 1988:43). The chronological and distributional ranges for all southeastern Paleoindian forms, it must be stressed, need to be determined with considerably greater precision than exists at the present.

One result of the increasing attention given post-fluted Paleoindian diagnostics in recent years is the recognition that large numbers of Dalton points occur across the Southeast (Anderson et al. 1990, n.d.; Ensor 1987, Goodyear 1982, Morse & Morse 1983). In some areas, such as the Georgia and Carolina piedmont, the incidence of both sites and diagnostics is quite high and, when better documented, may warrant comparison with Dalton occupations in the central Mississippi Alluvial Valley, where literally hundreds of sites have been recorded (Goodyear 1974, 1982; Morse 1971, 1973, 1975a, 1975b, 1977; Morse & Morse 1983: Redfield 1971). Many of the Georgia Dalton points are fluted—more properly speaking, basally thinned—arguing for a direct, possibly local transition from earlier fluted point assemblages. Interestingly, although Daltons are common in south Georgia, they are extremely rare in Florida, where Suwannee points, presumed Middle Paleoindian forms, actually extend in time to ca. 10,200 BP or later, making them contemporaneous with Dalton occupations elsewhere in the region (Brooks & Brooks n.d.; Dunbar et al. 1988; Dunbar, pers. comm. 1989). Contemporaneity of southeastern Dalton assemblages with the northeastern fluted point tradition recognized at sites such as Bull Brook I and II, Debert, and Vail has also been inferred (Meltzer 1988:20).

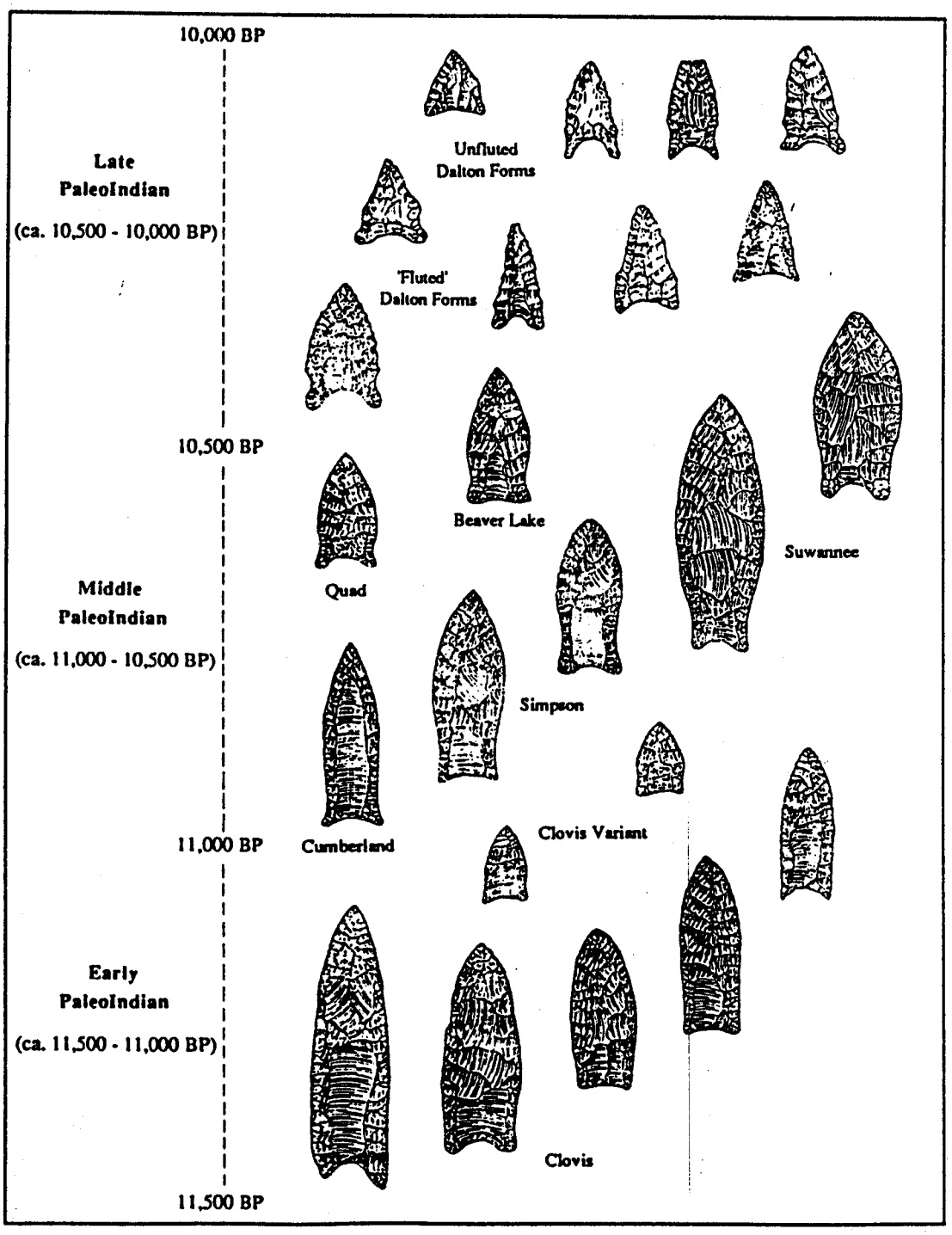

Figure 1. Paleoindian Chronology and Diagnostics in the Southeastern United States

Dalton points in the Southeast have traditionally been assigned a transitional placement, between Paleoindian and Early Archaic, because these populations lived in a time of major environmental change, when the late Pleistocene vegetation and fauna were being replaced by modern species (see Morse 1975a, Goodyear 1982). The appearance of the Dalton point form is thus thought to signal a major change in adaptive strategy throughout the region, away from the hunting of a range of large and small Pleistocene fauna and towards the utilization of smaller, Holocene species. The Dalton point and accompanying toolkit retain many characteristics of earlier assemblages, although the presence of serrations and evidence for resharpening to exhaustion suggest greater use of these bifaces in a range of cutting tasks compared with earlier Paleoindian points (Ahler 1971; Goodyear 1974, 1982). This seemingly increased emphasis on the use of Dalton points as multipurpose tools in Late Paleoindian times, if accurate, may be related to the emergence of generalist, foraging adaptations over the region, as some investigators have suggested (e.g., Claggett & Cable 1982, Meltzer 1984, Meltzer & Smith 1986).

Excavation Data

To date, over 50 major Early and Middle Paleoindian assemblages have been excavated and reported from the eastern United States and Canada, mostly from the Northeast and upper Midwest (Meltzer 1988:8–10). Only a few of these sites, however, occur in the Southeast, a pattern that has frustrated and challenged researchers working within the region and intrigued those fortunate enough to work in more productive areas (see Goodyear et al. 1989, MacDonald 1983:106). Early and Middle Paleoindian sites from the Southeast yielding appreciable numbers of fluted points and other artifacts are rare and, when found, tend to be associated with lithic raw material sources, as at the Pine Tree, Quad, Thunderbird, Wells Creek Crater, and Williamson sites (Figure 3) (Cambron 1956, Dragoo 1973, Gardner 1974, McCary 1951, Soday 1954). While large numbers of Paleoindian points have been found across the Southeast, sites producing more than about 10-20 of these artifacts are uncommon (Table 2). With few exceptions, furthermore, most of the material from the larger southeastern sites comes from surface context. Assemblages recovered in excavation context predating 10,500 BP are, thus, extremely rare across much of the Southeast.

Meltzer (1984, 1988:13–14, 38ff) has argued that the scarcity of large Early Paleoindian sites in the Southeast, compared to their more common occurrence in the Northeast and upper Midwest, is not due either to modern farming practices or to amateur or professional survey behavior, which might affect discovery rates. Instead, Meltzer has hypothesized the existence of different Paleoindian adaptive strategies in these two areas, directed to the very real differences in resource potential and leaving behind markedly different archaeological records:

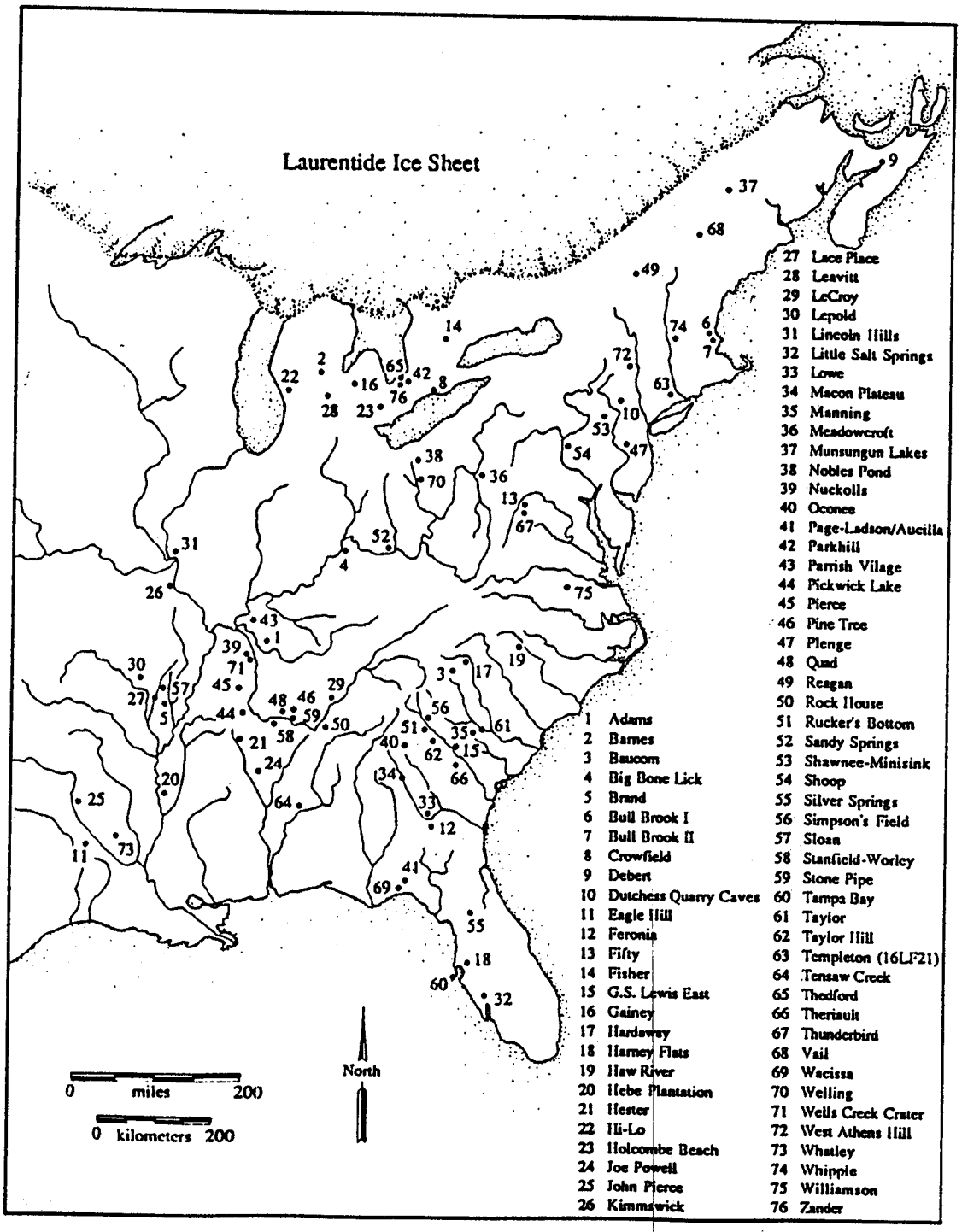

Figure 3. Major Paleoindian Sites in Eastern North America

There were two major biotic communities in eastern North America during the late Pleistocene, providing very different adaptive settings: a northern tundra and spruce parkland and a southern complex boreal-deciduous forest. The adaptive strategies of [eastern Fluted Point] groups in these environments would have necessarily been different. Those on the tundra and tundra-forest ecotone probably exploited caribou, the only species that would yield sufficient economic return to allow humans to survive there. Groups in the species-rich forests were, I suspect, generalists, who exploited a variety of subsistence resources, including

Table 2. Major Fluted Point Sites from the Southeast Compared with Assemblages from the Northeast and Midwest

Sites	*Number of Fluted Points*	*State or Province*	*Data Sources*
SOUTHEASTERN SITES			
LeCroy	9	Tennessee	Lewis & Kneberg 1956
Lincoln Hills	ca. 100	Illinois	Brad Koldehoff 1989: pers. comm.
Nuckolls	3	Tennessee	Lewis & Kneberg 1958:62
Pierce	9	Tennessee	Broster 1982:94–96
Pine Tree	ca. 15	Alabama	Cambron 1956:3
Quad	ca. 200	Alabama	Futato 1982:32
Stone Pipe	ca. 5	Alabama	Cambron 1955:55–56
Thunderbird	14	Virginia	Gardner & Verrey 1979:21
Wells Creek Crater	36	Tennessee	Dragoo 1973
Williamson	ca. 150	Virginia	Peck 1985, McCary 1986
OTHER EASTERN SITES			
Adams	100+	Kentucky	Sanders 1983, 1988
Barnes	28	Michigan	Shott 1986a:160
Bull Brook I	ca. 400	Massachusetts	Grimes 1982:41
Debert	140	Nova Scotia	MacDonald 1968:70
Fisher	ca. 150	Ontario	Storck 1984
Gainey	37	Michigan	Shott 1986a:160; Henry T. Wright 1989: pers. comm.
Leavitt	8	Michigan	Shott 1986a:160
Nobles Pond	13	Ohio	Gramly & Summers 1986:120
Parkhill D	9	Ontario	Roosa 1977
Plenge	131	New Jersey	Kraft et al. 1982:38
Sandy Springs	72	Ohio	Seeman & Prufer 1982:157
Shoop	53	Pennsylvania	Witthoff 1952, Cox 1972, Kent 1982:39
Thedford	16	Ontario	Ellis 1984
Vail	79	Maine	Gramly 1982:22
Welling	54	Ohio	Prufer & Wright 1970
West Athens Hill	38	New York	Wellman 1982:40
Whipple	17	New Hampshire	Curran 1984
Zander	26	Ontario	Stewart 1985

seeds, nuts, small mammals, and perhaps, an occasional deer or mastodon. . . . The resources used by generalized foragers are extensive and dispersed, and more importantly, activities such as nut collecting leave little trace in the archaeological record. In contrast, specialized hunters focusing on point resources such as caribou produce a site record more conducive to discovery (Meltzer 1988:41–42).

Meltzer has further suggested that many eastern fluted point sites may have been overlooked because they lack the well-preserved and massive quantities of bone more typical of Paleoindian kill sites on the Great Plains (Meltzer 1988:38).

To elaborate upon this point somewhat, I suggest that the Paleoindian archaeological record in the Eastern Woodlands, particularly in the Southeast, is more extensive that has sometimes been implied. The site records that are present in the region, however, have been masked by factors of preservation and prehistoric land use. There are two reasons for this patterning. First, the vast majority of southeastern Paleoindian kill sites in all probability occurred in depositional environments poorly suited to the preservation of faunal remains. The high precipitation, extensive and stable vegetation cover, and low overall relief characteristic of much of the region, particularly in the Atlantic and Gulf coastal plains, precluded opportunities for rapid deposition. Faunal remains from kill sites along river margins in these physiographic regions would likely wash away during floods, while those on more elevated terraces would, in all probability, quickly decompose in the acidic soils typical of these microtopographic settings over much of the region.

Second, many of the locations in the southeastern United States that have yielded fluted points have also produced appreciable, and in some cases, tremendous quantities of post-fluted point diagnostics and other debris. This problem of multicomponency, or redundant land use, may not be as common in other parts of North America, such as the Northeast or West. The Pine Tree locality in Alabama, for example, which has yielded approximately 15 Paleoindian points, has also produced thousands of later projectile points (Cambron 1956:3, Eugene Futato, pers. comm. 1989). A similar pattern is evident at the LeCroy site in eastern Tennessee, where nine fluted points were found amid a collection of almost 9,000 whole and broken points (Lewis & Kneberg 1956:5). Comparable ratios of Paleoindian to later materials have been observed at fall line sites on the Atlantic slope. At the Taylor and Manning sites in central South Carolina, for example, the 10–15 or so Early and Middle Paleoindian points that have been found are all but lost amid the thousands of later points (Anderson 1979:240; Michie 1971, 1977). These sites have also produced hundreds if not thousands of formal stone tools, such as hafted end and side scapers. Sorting Paleoindian from post-Paleoindian materials at Manning, Taylor, and similar multicomponent sites in the region is, thus, difficult or impossible, given the similarities in toolkit and raw material use evident between the Paleoindian and subsequent Early Archaic occupations.

The southeastern Early and Middle Paleoindian archaeological record that has been most typically found across much of the region—isolated or small numbers of fluted points in contexts difficult or impossible to separate from subsequent Late Paleoindian or Early Archaic occupations—may actually derive from assemblages similar to those found elsewhere on the continent. A much more extensive regional occupation would probably be accepted if only 1 in 50 or even 1 in 100 of the southeastern sites yielding fluted points possessed extinct faunal remains, or if more of the formal tools from such sites could be unambiguously attributed to the Paleoindian occupations.

Given these considerations, the nature of the Early and Middle Paleoindian archaeological record that does exist in the Southeast warrants further examination. While this discussion is general in orientation and broadly regional in scope, specific site discussions in the pages that follow tend to focus on Georgia and the Carolinas, the area with which I am most familiar. This emphasis is not inappropriate, since the first Paleoindian fluted projectile point found in secure excavation context in the eastern United States, and recognized for what it was, came from the WPA excavations at Macon Plateau in central Georgia (Kelly 1938:2–8). The Macon find occurred in 1935, the year that Bushnell (1935:35) drew attention to surface finds of fluted points in Virginia. While fluted points had been previously recognized in Mississippi by Brown (1926:132–134), who described them as Coldwater points, their great age was not immediately recognized (McGahey, 1981). The first incontrovertible demonstration of the co-occurrence of humans and extinct, late Pleistocene fauna (*Bison antiquus figginsi*), it must be remembered, occurred only in 1926, at Folsom, New Mexico (Figgins 1927). The Dent site excavations, the first indisputable association of early hunters with mammoth, occurred even later, in 1932 (Figgins 1933). At the time of the Macon excavations, fieldwork was underway at both Black Water Draw and Lindenmeier, classic Paleoindian sites that further demonstrated the contemporaneity of early man and extinct Pleistocene fauna and, at Black Water Draw, the relative ages of Clovis and Folsom points (Hester 1972, Wilmsen & Roberts 1978).

Only one fluted point was found at Macon, despite a massive excavation effort directed to the recovery of early material (Kelly 1938, Waring 1968:237). The Macon Plateau investigations were, thus, the first of many documenting the apparent scarcity of fluted points on Early Paleoindian sites in the lower Southeast. Through the late 1980s, in fact, Early Paleoindian assemblages yielding more than one diagnostic have only rarely been found in secure context in the region. While substantial numbers of Paleoindian artifacts have been found in surface context, excavation assemblages recovered to date typically consist of isolated fluted points and varying numbers of presumably associated artifacts.

In the Savannah River Basin of Georgia and South Carolina, for example, where some 50 fluted points are currently known from surface contexts (Anderson et al. 1990, Charles 1986), only four fluted points have been found in secure excavation context, one each at Rucker's Bottom and Simpson's Field in the central piedmont, Taylor Hill on the fall line, and the Theriault chert quarry along Brier Creek in the central coastal plain (Anderson & Schuldenrein 1985, Brockington 1971, Elliott & Doyon 1981, Wood et al. 1986). Each of these was an essentially isolated artifact found during a major field program. The single fluted point found at Theriault came from an excavation block encompassing 142m^2, while the isolated fluted points at Taylor Hill, Simpson's Field, and Rucker's Bottom came from excavations encompassing 48m^2, 300m^2, and 160m^2, respectively. Although other plausible Paleoindian artifacts, such as

formal unifacial tools, were found in close proximity to the diagnostic fluted point at all four sites, the presence of only minimal stratification coupled with extensive later materials precluded unequivocal associations. While more extensive Early Paleoindian assemblages may exist in the Savannah River Valley, their existence remains to be demonstrated. To overcome the problems created by shallow deposits and multicomponency, recent research along the Savannah has been directed toward the geoarchaeological resolution of areas capable of yielding either deeply stratified deposits, isolated deposits (i.e., removed from potential reoccupation by channel migration), or both (Brooks et al. 1986, Brooks & Brooks n.d., Goodyear & Charles 1984, Goodyear et al. 1985).

The Savannah River examples do not appear to be in any way unique. In spite of the CRM research explosion of recent years, areally extensive investigations at Paleoindian sites have been extremely rare in the Southeast. The excavation at the Harney Flats site in west-central Florida, encompassing about 900m^2 into Late Paleoindian Suwannee and Early Archaic Bolen components, is the largest well-controlled excavation conducted to date at a Paleoindian site in the region (Daniel & Wisenbaker 1987); most excavations directed to Paleoindian components undertaken in the region have examined only a small fraction of this area. This dearth of intensive fieldwork appears to be primarily because the kinds of assemblages (i.e., extensive or well-stratified) necessary to justify the great expense of areally extensive excavation blocks have only rarely been found during CRM-funded survey and testing efforts. It is questionable, in fact, whether most CRM efforts undertaken in the Eastern Woodlands are adequate even to locate the deposits dating to this period, particularly if they are low in density or deeply buried (Haynes 1983:26). A major deep site testing program undertaken in one typical Southeastern reservoir project, for example, largely failed to examine deposits earlier than the Late Archaic period (Anderson & Joseph 1988:32). Comparatively minimal Paleoindian material has been found in excavation context in the region, even during major reservoir and construction projects (Anderson & Joseph 1988, Chapman 1985, Claggett & Cable 1982, Bareis & Porter 1984). Much of our knowledge about these early periods, therefore, continues to derive from surface finds, largely by amateur collectors.

This is not to say that *no* significant Early of Middle Paleoindian sites have seen excavation in the Southeast. Excavation projects documenting Paleoindian assemblages that are thought to predate 10,500 BP include work at the Kimmswick mastodon kill in Missouri (Graham et al. 1981), the Thunderbird locality in Virginia (Gardner 1974), Big Bone Lick (Tankersley 1985, 1990) and Parrish Village (Webb 1951) in Kentucky, and at a series of underwater sites in Florida such as Little Salt Springs, Page/Ladson, Silver Springs, Wacissa River, and in the Tampa Bay area (Figure 3) (Clausen et al. 1979, Dunbar et al. 1988, Goodyear et al. 1983, Hoffman 1983, Rayl 1974, Webb et al. 1984). The extensive and important underwater investigations at the Little Salt Springs, Page/Ladson, and Wacissa River sites, in particular, have demonstrated an

association of early human populations with extinct Pleistocene fauna and have led to the recovery of perishable materials that would have been lost on terrestrial sites.

Excavations documenting extensive assemblages assumed to post-date 10,500 BP are more common throughout the lower Southeast. The Suwannee/Bolen assemblages at the Harney Flats site in Florida fall into this time range, as apparently do the Bolen materials from Page-Ladson, suggesting an early, pre-10,000 BP transition to side notching in the Florida area (Dunbar et al. 1988:450). Major Dalton or Dalton-variant assemblages have been investigated in a number of states, including the Brand and Sloan sites in northeast Arkansas (Goodyear 1974, Morse 1975b); Lepold in southeastern Missouri (Price & Krakker 1975); the John Peace and Whatley sites in Louisiana, which yielded San Patrice points (Webb et al. 1971, Thomas & Campbell 1978); the Nuckolls site in western Tennessee (Lewis & Kneberg 1958); Hebe Plantation and Hester in Mississippi (Brookes 1979, Lauro 1981, Yarborough 1981); Joe Powell, Stanfield-Worley, Tensaw Creek, and Rock House in Alabama (DeJarnette et al. 1962; Ensor 1985, 1987); Hardaway and Baucom in North Carolina (Coe 1964, Peck & Paynter 1984); and Taylor in South Carolina (Michie 1971). In Georgia and the Carolina's, minor Hardaway-Dalton assemblages have been reported from the Lowe site in Georgia (Crook 1987:54), the Haw River sites in piedmont North Carolina (Claggett & Cable 1982), G. S. Lewis East in the coastal plain of South Carolina (Hanson n.d.), Rucker's Bottom in the northeast Georgia piedmont (Anderson & Schuldenrein 1985:298), and from several locations in the Oconee River of piedmont Georgia (O'Steen et al. 1986). In addition to these finds of Late Paleoindian remains in large-scale excavations, more limited testing and surface collection have occurred at thousands of locations across the region as a result of CRM-funded survey work, resulting in the discovery of large numbers of Late Paleoindian artifacts and expanding the data base available for analysis.

PAST AND CURRENT VIEWS ABOUT PALEOINDIAN SETTLEMENT IN THE EASTERN WOODLANDS

As seen from the foregoing literature review, much of the Early and Middle Paleoindian material found to date in the Southeast has come from surface contexts. As a result, many of our interpretations about local Paleoindian lifeways are influenced by excavation findings in other parts of the United States. The hunting of Late Pleistocene fauna is assumed to have been commonplace throughout much of the Southeast, in part because of an overlap in the geographic distributions of Paleoindian materials and fossil remains of mammoth, bison, and other now-extinct animal species (Williams & Stoltman 1965), and in part, because clear associations of Paleoindian materials with Pleistocene fauna have

been documented at sites in the Southwest and on the Great Plains. Evidence for the Paleoindian exploitation of animals of any kind, in contrast, has only been rarely found in the Southeast (Meltzer 1988:23–24). Only in Florida have associations of artifacts and Late Pleistocene fauna been reported (e.g., Dunbar et al. 1988, Hoffman 1983). While many of these discoveries are controversial due to their occurrence in river or sink bottom contexts, indisputable associations of Paleoindian artifacts with *Bison antiquus* and the giant land tortoise, *Geochelone crassiscutata*, have been documented (Clausen et al. 1979, Webb et al. 1983).

The replacement of fluted point forms by non-fluted tool complexes in the Eastern Woodlands is thought to reflect a change in adaptive strategy, away from the specialized hunting of megafauna and toward a more generalized adaptation that included the hunting of smaller game, especially deer (Goodyear 1974, Morse 1973:30, Oliver 1985:197–199, Smith 1986:9–13, Stoltman & Baerreis 1983). In addition to the exploitation of a range of animals, the gathering of wild plant foods is assumed to have played an important part in the southeastern Paleoindian diet, although once again little evidence in support of this inference is available. The nature of the Paleoindian archaeological record from south of the ice margin has suggested to some archaeologists that the emergence of a generalist, foraging adaptation in this part of the Eastern Woodlands took place earlier, shortly after the initial period of settlement, or perhaps even characterized the adaptation of the founding populations. The clearest proponent of this view has been Meltzer (1984, 1988; Meltzer & Smith 1986), whose position on Paleoindian adaptation in the mixed boreal-deciduous southern forests was summarized previously.

The questions of whether and when early human populations adopted foraging strategies in the Southeast have seen considerable investigation in recent years. Claggett and Cablé (1982:13) have argued that changes from the Late Paleoindian into the Early Archaic period in the South Atlantic slope were from systems emphasizing logistical mobility and curated technologies to those emphasizing residential mobility and expedient technologies (*sensu* Binford 1980). These changes, they further postulate, were the direct result of post-glacial warming and the emergence of homogeneous hardwood canopies over much of the region. At the Haw River sites in piedmont North Carolina, a pronounced shift from curated to expedient tool forms was noted between the Late Paleoindian Dalton and Early Archaic Kirk occupations (Claggett & Cable 1982:686–687, 764). A subsequent examination of assemblage data from 98 Early Archaic sites in the same region found that most assemblages were characterized by highly expedient technologies, with only a low incidence of formal, curated tools (Anderson & Schuldenrein 1983:201). Even if foraging adaptations were not present during initial Paleoindian times in this part of the lower Southeast, they apparently soon developed.

Overall population density during the Paleoindian period in the Southeast is thought to have been quite low, as evidenced by the fact that most "sites" of the period are actually either isolated projectile points or quite small in extent (Meltzer 1988). The regional Paleoindian record is portrayed as so sparse and diffuse, except for the infrequent occurrence of quarry-related site/artifact clusters, that Meltzer (1988:42) has suggested that "the eastern fluted point groups were true ecological foragers, 'wandering' over the landscape exploiting a variety of species." Such a postulated settlement/mobility pattern warrants consideration, particularly during the first generation or so of initial exploration, when the human landscape was empty. For the period immediately following initial human penetration, however, such a pattern appears to be unrealistic. While it is sometimes suggested that Paleoindian sociopolitical organization would have been quite simple and uncomplicated, in all probability fairly sophisticated information exchange and mating networks would have had to develop for these populations to remain reproductively viable (see Wobst 1974, 1976; Wright 1981; Anderson & Hanson 1988). The need to find and exchange mates in a cultural environment characterized by an extremely low population density probably greatly shaped the nature and extent of Early Paleoindian settlement systems in the region. As population grew and the landscape filled up over the course of the Paleoindian and subsequent Archaic periods, the strength of this driving force would have lessened.

Local (band-level) and regional (macroband-level) settlement systems of the kind postulated for post-Paleoindian, Early Archaic times in the Southeast may have had analogs operating at much larger geographic scales during the Paleoindian period (Anderson & Hanson 1988). Band-level co-residential population aggregates of some 50–150 people may have been present in a number of areas, wandering over appreciable areas while loosely tethered to a primary quarry source. Movement along or between several river drainages by members of these bands may have been commonplace. Larger, regional macroband-level social entities could have also been present, although these may have been temporary associations in most areas, formed by the occasional, possibly planned meetings of individuals from two or more bands. As population grew over time, group ranges would have decreased, first to within progressively fewer drainages, then to a single drainage, and finally to portions of drainages. This circumscription is thought to have been gradual, with the emergence of discrete cultural entities within segments of the region's smaller drainages unlikely until well into the Archaic (see Sassaman et al. 1988).

The propensity for fluted points and fluted point sites to occur near high-quality lithic raw material sources in the southeastern United States has been widely noted (e.g., Dunbar & Waller 1983, Gardner 1974, Goodyear 1979, Meltzer 1988:28, 41). Based on work at Thunderbird, Fifty, and a series of related sites in the middle Shenandoah Valley of northern Virginia, Gardner

(1974, 1977, 1983) has argued that Paleoindian/Early Archaic settlement systems in portions of the eastern United States were "tethered" to, or centered on, quarry areas. For at least part of the year, populations were located in base camps situated near quarries, from which smaller foraging groups radiated seasonally, returning when their toolkits were exhausted or for scheduled social events. Because of a continuing need for fresh stone, quarries would have been predictable spots on the landscape that foraging groups would revisit. As such, they served as convenient rendezvous or aggregation loci for social as well as technological activities. Although this model was initially proposed for the ridge and valley province of the Middle Atlantic region, Gardner (1983) has since expanded its scope, arguing that it helps to explain the distribution of Paleoindian/Early Archaic sites along much of the Atlantic seaboard.

Five functionally distinct site categories have been advanced in Gardner's (1977:258–259) model: (1) quarries, where primary raw material extraction occurred; (2) quarry reduction sites, where initial reduction prior to transport occurred; (3) quarry-related base camps, where a wide range of activities, including extended habitation, occurred; (4) periodically revisited hunting camps; and (5) sporadically visited hunting sites. The occurrence of the first three of these site types is directly constrained by the occurrence of lithic raw materials within the landscape, the attribute Gardner (1977:260, 1982:57) described as the key to understanding Paleoindian/Early Archaic site distributions in this part of the Eastern Woodlands. Gardner's model may have considerable utility in areas where lithic raw materials are scarce or restricted in occurrence, but tethering arguments are harder to justify in lithic-rich environments, such as the southern piedmont physiographic province, where quartz, slate, and other materials are nearly ubiquitous. The extent to which the distribution of lithic raw materials on the landscape constrained hunter-gatherer mobility is unknown but has been the subject of some debate (Gould 1978:288, Binford 1979:260–261, Gould & Saggers 1985, Binford & Stone 1985). In the Eastern Woodlands, where few areas are more than 100 km or so from knappable material, tethering appears related as much to the quality of available stone as to its quantity or accessibility (Goodyear 1979, Goodyear et al. 1989).

Gardner's raw material tethering arguments, for better or for worse, have been widely and enthusiastically adopted in many areas within the Eastern Woodlands. In Florida and South Carolina, large numbers of Paleoindian points have been found in or near areas yielding high-quality chert, while comparatively far fewer remains have been found away from these areas (Dunbar & Waller 1983; Goodyear et al. 1985, 1989). Areas lacking appreciable numbers of fluted points are assumed to have been raw material "dead zones" lacking high-quality stone sources and, thus, would have been avoided by early populations. Paleoindian hafted bifaces found in these areas are indeed frequently small and extensively reworked, while associated toolkits and debitage also exhibit evidence of raw material conservation strategies (Goodyear 1979, Goodyear et al. 1989, Mac-

Donald 1968, Meltzer 1988). This pattern has been noted on Paleoindian artifacts from the piedmont of Georgia, an area lying intermediate to major raw material sources in eastern South Carolina, south Georgia, and the Tennessee River Valley (O'Steen et al. 1986; Anderson et al. 1990, n.d.). The extent to which tethering or raw material/toolkit entropy constrained initial Paleoindian colonization and, once populations were present, subsequent mobility patterns, thus remains open (see Cochran et al. and Tankersley, this volume). The fluted point distributional data from the Eastern Woodlands reveal appreciable numbers of fluted points in the area of high-quality raw material, such as the central Ohio and Tennessee river valleys, but also document concentrations in areas along the Atlantic seaboard, where it is difficult to attribute unusual properties to local or nearby stone sources (Figure 2). While high-quality lithic raw materials were unquestionably selected by Early Paleoindian populations, we argue that this was only one of a number of variables dictating colonization and settlement.

Modeling Late Paleoindian settlement has received comparatively less effort than attempts to model activity during earlier periods in the Southeast, except in the central Mississippi Valley, where large numbers of Dalton sites have been reported and examined (Morse 1971, 1973; Redfield 1971). Based on data from northeast Arkansas and southeast Missouri, Morse (1975a, 1977; Morse & Morse 1983:70–97) has argued that Dalton bands lived in permanent or semi-permanent base camps, from which they exploited hexagonally-shaped territories oriented along major watersheds. Within each territory the base camps, such as Lace (Redfield & Moselage 1970), tended to be centrally located in areas roughly 10 km in diameter, allowing for reoccupation in different locations. Outlying logistical stations, most of which are thought to have been male hunting/butchering camps, were scattered throughout the rest of the territory. The Brand site, excavated by Morse and Goodyear (Goodyear 1974), has been interpreted as this kind of site. Other specialized sites included vegetable food processing and collecting loci, cemeteries, and quarry areas. Fixed territories roughly 2,200-3,200 km^2 in extent have been proposed, with formal cemeteries, such as the Sloan site (Morse 1975b), present in each, possibly serving as settlement foci as well as markers of territorial claims. Schiffer (1975a, 1975b) and Price and Krakker (1975), in challenges to this model, have argued against the existence of linear, drainage-orientated territories, suggesting instead that Dalton groups, at least in the northeast Arkansas and southeast Missouri area, "occupied territories which crosscut major physiographic and resource zones" (Schiffer 1975a:111). The presence of year-round settlements was also challenged, and greater annual mobility, perhaps between seasonal (i.e., summer and winter) base camps, was proposed as an alternative strategy. The Brand site, with its extensive formal tool assemblage, was interpreted as a seasonal base camp rather than a temporary hunting station (Schiffer 1975a:100–111). We do not yet have the data necessary to evaluate these two opposed constructs.

In other parts of the Southeast, the Late Paleoindian/initial Early Archaic

period witnessed a gradual replacement of logistical systems by more seasonally variable, predominantly residentially mobile adaptations (*sensu* Binford 1980). The same phenomenon appears to have occurred in northeast Arkansas. In this view, the Dalton adaptation—with its curated, logistically-organized technological system characterized by central base camps, cemeteries, and hunting camps, and its apparent large attendant local populations—became an increasingly untenable means of dealing with the more homogeneous regional environmental conditions and resource structure emerging during terminal Paleoindian times in the central Mississippi Valley. Such ecological conditions are better suited to residentially mobile foraging populations than to centrally-based, logistically-organized groups. The "Dalton collapse" was, thus, not so much a population *decline*, although this probably also occurred, as a population (and organizational) *rearrangement*. That is, populations once concentrated in centrally-based territories were now much more residentially mobile, dispersing over greater areas and leaving a less concentrated and, therefore, less pronounced archaeological record of their activities (i.e., more smaller residential sites with fewer artifacts, rather than large, dense base camps).

Virtually the only attempt to examine Paleoindian settlement data in Georgia and the Carolinas has been carried out by O'Steen and her colleagues using materials from the upper Oconee River Valley in Georgia (O'Steen et al. 1986). Ninety-one Paleoindian sites yielding 95 components were identified in the Oconee River survey sample, most of which were short-term or limited-activity sites, with a few quarry locations and larger residential sites. Sites were grouped by four types of landform: levee, terrace, uplands edge, and upland. A gradual expansion of occupation through time and into new areas was indicated. Early Paleoindian sites were located primarily in the floodplain, with a few sites on the uplands edge. Middle Paleoindian sites still occurred frequently in the floodplain, but there was also evidence for exploitation of the upland or interriverine areas. Dalton sites occurred in all zones, with a majority of sites in the uplands edge and uplands. The data suggested that, by Late Paleoindian times, populations were utilizing upland areas more frequently. A concentration of large sites at shoals, possible game crossing or fording areas, was evident. The use of local as opposed to extralocal raw material increased dramatically over time in the Wallace Reservoir sample. Early Paleoindian diagnostics were predominately on extralocal materials, while most Middle and Late Paleoindian points were made of locally available raw materials (O'Steen et al. 1986). A similar pattern was documented in the Russell Reservoir collections from the upper Savannah River (Anderson & Joseph 1988:25).

The available projectile point distributional data from the general region, in conjunction with the analyses from the Wallace Reservoir, suggest that the coastal plain and ridge and valley provinces were more heavily utilized than the piedmont during the earlier Paleoindian period, at least in the Georgia area. Piedmont Georgia Paleoindian points tended to be small and extensively reshar-

pened; broken points were often modified and used as scrapers, wedges, and gravers; and broken blades were often fashioned into new but smaller bifaces (O'Steen et al. 1986). The extensive reworking of these local assemblages suggests that the area was on the fringes of settlement networks centered elsewhere. Intensive utilization of the Georgia piedmont, including the upper Savannah River area, does not appear to occur until the latter portion of the Paleoindian period or in the succeeding Early Archaic.

THE PALEOINDIAN COLONIZATION OF THE EASTERN WOODLANDS: A BIOCULTURAL MODEL

The primary route of human entry south of the Wisconsinan ice sheets is assumed to have followed the so-called ice-free corridor, which had opened in west-central Canada by approximately 12,000 BP (Figure 4) (Dyke & Prest 1987, White et al. 1985). Examining the options that were available to initial human groups entering via this corridor suggests patterns by which subsequent population movement and, hence, colonization occurred. Regional drainage structure almost certainly dictated the direction and rate of spread of the initial colonists. South of the ice-free corridor, a series of major west-to-eastward-trending drainages occur, including the Missouri, Platte, Arkansas, and Red Rivers, proceeding from north to south. These drainages were well-incised and occupied essentially their present courses at this time. Human populations entering the continental United States from the north would encounter each of these drainages in turn as they proceeded southward. Each river would have offered a favorable transportation artery to the south and eastward, assuming movement was along and not across channels. Once groups started down any of these major drainages they would eventually, and probably in fairly short order, reach the central Mississippi River Valley.

If initial human penetration south of the ice sheets occurred around 11,500 BP, then quite possibly groups reached the Eastern Woodlands no more than a century or two later. Fairly appreciable numbers of fluted points have been found along the lower Missouri drainage in central Missouri (Chapman 1975:67), in the central Mississippi Valley in the vicinity of northeast Arkansas (Morse & Morse 1983:60–64) and, to a lesser extent, along portions of the lower Red River in Louisiana (Gagliano & Gregory 1965, Smith et al. 1983) (Figure 2). These areas would have been among the first encountered by populations moving down the major river systems of the western midcontinent. The extent to which these assemblages represent remains left by initial colonizing populations passing through these areas, or by more settled, later occupants is currently unknown, however.

The very structure of the North American landscape would have literally channeled early populations emerging from the ice-free corridor down the major

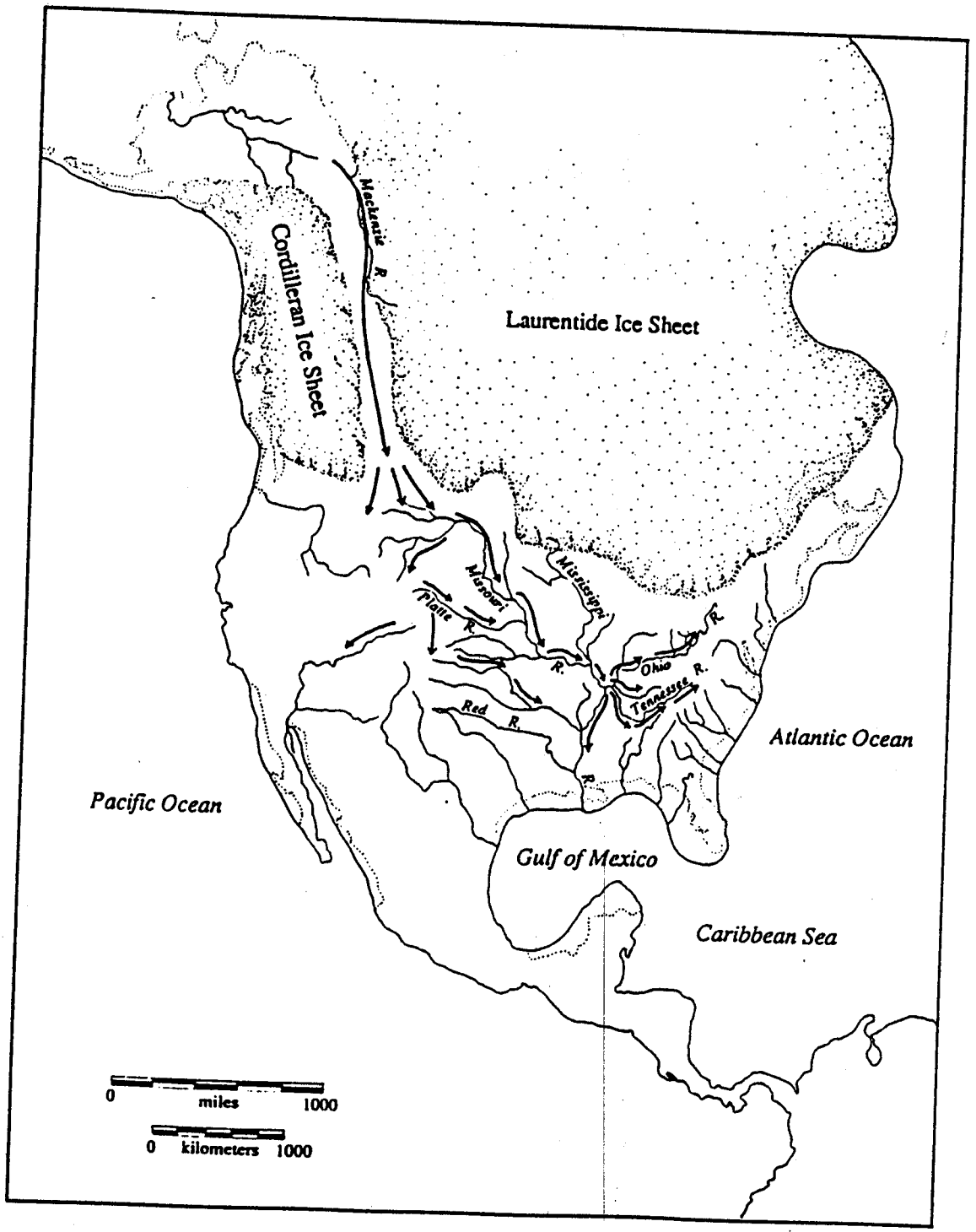

Figure 4. Route of Entry into the New World and the Chanelling of Early Populations into Eastern North America by Regional Physiographic Structure

river systems into the Eastern Woodlands. Therefore, it is possible and indeed probable that Paleoindian populations reached the margins of the southeastern United States at a very early date, possibly contemporaneous with or earlier than the dates for the earliest well-documented Paleoindian sites in the Southwest and lower Great Plains. From the central Mississippi Valley there are essentially three major, readily defined routes into the interior of the Eastern Woodlands—along the Ohio, Cumberland, and Tennessee river valleys (Figure 4). Not surprisingly, the central Ohio, lower Cumberland, and central Tennessee river valleys and their immediate tributaries have produced the largest concentrations of Paleoindian projectile points that have been found anywhere in the Eastern Woodlands (Figure 2). The true Clovis points found in these areas, in fact, far exceed in both density and quantity the number of Clovis points recovered from any other comparably sized locality in the United States. These distributions support observations by Mason (1962:233) and Williams and Stoltman (1965:676), who long ago noted a correlation between Paleoindian occupation and major river systems in the Eastern Woodlands, and who suggested that the larger river valleys served as main settlement and communications arteries. These distributional patterns, furthermore, appear to be robust, even given the very real problems attendant upon using survey data of this kind (e.g., Lepper 1983, 1985; Moeller 1983:27).

I suggest that the central Ohio, lower Cumberland, and central Tennessee river valleys served as staging areas during the colonization process (Figure 5). In these areas, Paleoindian population movement slowed for a comparably brief interlude, probably for one to three centuries at most, providing a stable social environment within which populations could grow and familiarize themselves with their surroundings. These areas, encompassing portions of some of the largest Gulf-draining rivers east of the Mississippi, would have undoubtedly offered a tremendously attractive habitat to early populations. They were ecologically rich, situated along major transportation/communication arteries, and characterized by some of the best lithic raw material sources in the Eastern Woodlands.

Settlement in these areas, however temporary, would have fostered rapid population growth, particularly as group mobility decreased and females were to some extent relieved from mobility and, possibly, diet-linked pressures inducing wide birth spacing (e.g., Frisch 1978a, 1978b; Wendorf 1989). It is unlikely, in fact, that rapid Paleoindian population growth could have occurred without staging interludes in particularly productive environments. Use of staging areas would also provide these early populations the opportunity to familiarize themselves with the range of exploitable subsistence resources available in their new homeland. The rapid development of a foraging or generalist economy during the Paleoindian period over much of the Eastern Woodlands has been postulated by a number of researchers (e.g., Anderson & Hanson 1988, Claggett & Cable 1982, Meltzer & Smith 1986, Meltzer 1988); such a trend would probably have been

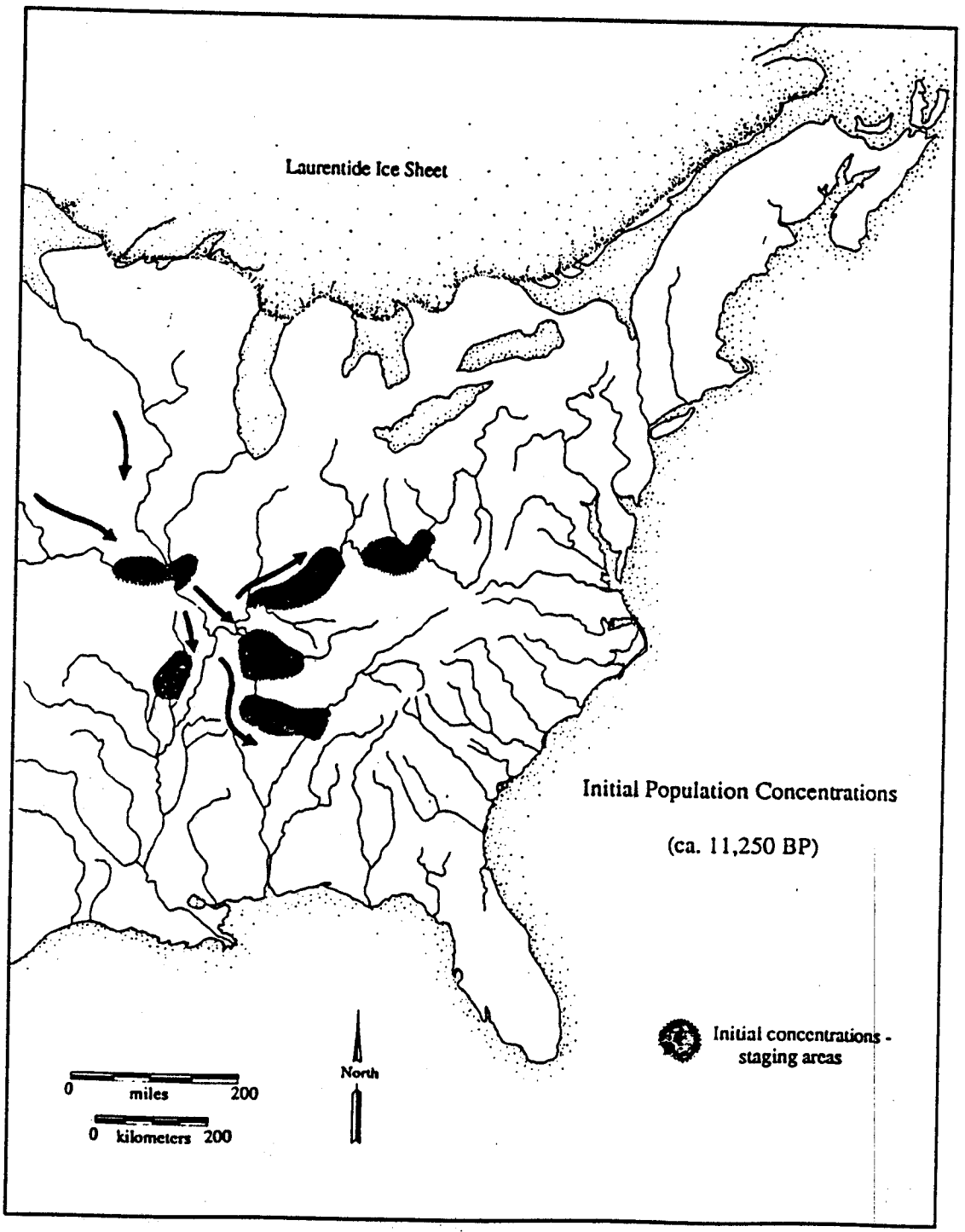

Figure 5. Initial Paleoindian Population Concentrations, in Staging Areas, ca. 11,250 BP

facilitated more by residence in staging areas (however temporary) than by a pattern of constant long-distance movement.

As populations in staging areas grew, group fissioning would have become necessary to alleviate intragroup dissension (Johnson 1982). The organizational structures of these presumably band-level groups lack the mechanisms necessary to hold increasingly larger numbers of people together. Equally important, there would be no reason for the development of such mechanisms, since the absence of human pressure on the landscape would make the relocation of dissident parties straightforward. Once the initial founding populations had settled into staging areas, it was probably only a comparatively brief time before group fissioning occurred, followed by the colonization of new regions (Figure 6). Every doubling of regional population levels, which could occur in 25 years or less, would mean a doubling of potential colonizing groups. While many groups may have chosen to stay in relatively close proximity to the staging areas, filling in the landscape to some extent, it is likely that some groups launched out on their own into completely new areas. Assuming that these groups were self-sufficient bands, subsequent return to the staging area would have been unlikely, although such a course would have remained an option should disaster overtake the colonizing party.

The emergence of regional Paleoindian traditions during the Middle Paleoindian period, by or shortly after 11,000 BP, suggests that social differentiation occurred fairly quickly, within a few centuries of initial human entry. Thus, colonization of the region was rapid, and long-distance movement was probably commonplace. Even given the presence of staging areas, therefore, the Paleoindian colonization of the Eastern Woodlands was aggressively rather than tentatively pursued. Groups radiated outward from the staging areas in the central Ohio, Cumberland, and Tennessee river valleys, and while much of the landscape was undoubtedly visited, settlement appears to have been selective (Figure 6). Florida appears to have been reached quite early, given the ca. 12,000 BP dating of artifacts in Little Salt Spring (Clausen et al. 1979). Except for the Aucilla River area in the northwestern panhandle, however, occupation of Florida appears to have been sparse until the Middle or even the Late Paleoindian period. Few of the Paleoindian diagnostics from Florida are actually true Clovis fluted points; instead, most are later Suwannee or Simpson forms (Purdy 1983, Dunbar et al. 1988:451).

The Atlantic seaboard was also apparently reached at a fairly early date, given the dense concentrations of true Clovis points in some areas, particularly in the central and northern portions of this region. Sites such as Williamson in Virginia and Shoop and Plenge in the Pennsylvania/New Jersey area may mark the centers of localized staging areas, comparable to but less extensive than those postulated in the Ohio, Cumberland, and Tennessee river valleys. Exploration and settlement of the Middle Atlantic and lower Northeast may have proceeded from these centers. Not all areas of the Atlantic seaboard were initially utilized, however, as

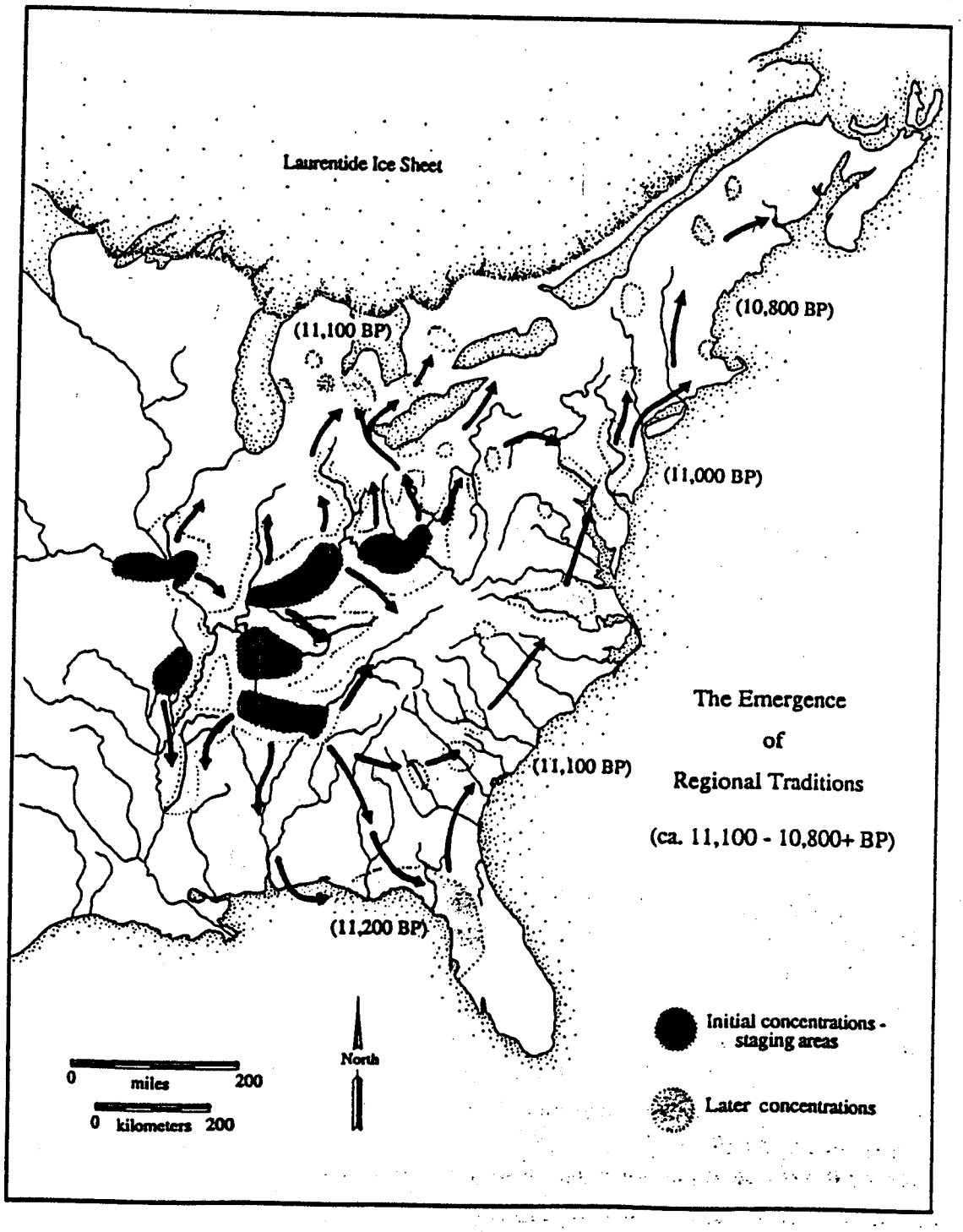

Figure 6. Patterns of Paleoindian Exploration and Settlement from the Staging Areas, ca. 11,000–10,500 BP

the empty areas in coastal Georgia and coastal North Carolina testify. While the occupation at Shoop has been dated to ca. 11,000 BP (Cox 1986:136), colonization further north appears to have been considerably later. Radiocarbon dates from Paleoindian sites such as Vail, Debert, and others indicates that extensive use of the Northeast did not occur until well after 11,000 BP, possibly not until as late as ca. 10,600 BP (Meltzer 1988:16–17, 43). By this time, regional traditions are assumed to be well-developed throughout much of the region to the south, and in some areas the lanceolate traditions were giving way to notched Dalton forms (Goodyear 1982).

The dating of the Paleoindian colonization of the upper Midwest remains ambiguous but appears to date to ca. 11,000 BP or shortly thereafter (Shott 1986a:122–132). Successive Gainey and Parkhill Phase occupations, identified by Gainey and Barnes projectile points, have been placed at ca. 11,000 and ca. 10,500 BP, respectively. The broadest published inferred ranges for these phases are from 11,500 to 10,750 BP and 10,750 to 10,200 BP, respectively (Shott 1986a:132). More restricted temporal estimates for the earlier Gainey Phase, presumably representing the time of initial colonization and settlement, fall between ca. 11,000 and 10,500 BP (Simmons et al. 1984:267). Based on analyses of lake levels, Storck (1984:287) has estimated this range to be between ca. 11,200 and 10,400 BP. Thus, settlement of the Great Lakes region apparently took place slightly later than the initial settlement of the Ohio River Valley, probably by groups coming from this region. Such timing, parenthetically, renders extremely unlikely the inference that the initial populations south of the ice-free corridor migrated into the Eastern Woodlands along the tundra margin and only later colonized the areas to the south (e.g., Wendorf 1989:515).

The Paleoindian archaeological record from eastern North America, I argue, seems to support the colonization model advanced here, particularly the concept of relatively stable "staging areas" from which the settlement of the region proceeded. Classic Clovis fluted projectile points, assumed to represent unambiguous signatures of the earliest occupants, exhibit a remarkable distribution. While isolated points are found over a comparatively large part of the United States, concentrations are restricted to the central Mississippi, Ohio, Cumberland, and Tennessee river valleys, and to portions of the Atlantic coastal plain (Figure 2). Later Paleoindian projectile point forms, in contrast, are much more widely distributed throughout the region and on a wide range of landforms, and they exhibit stylistic and technological differences indicative of the emergence of comparatively isolated regional populations (Figure 7).

Considerable evidence exists supporting the idea that the central Ohio, lower Cumberland, and central Tennessee river valleys saw extensive use during the Early Paleoindian period. In Mississippi, for example, Early and Middle Paleoindian diagnostic hafted bifaces are found in large numbers in the northern and western portions of the state, in and near the Tennessee River Valley (McGahey 1987). Only during Late Paleoindian Dalton times is there evidence for much use

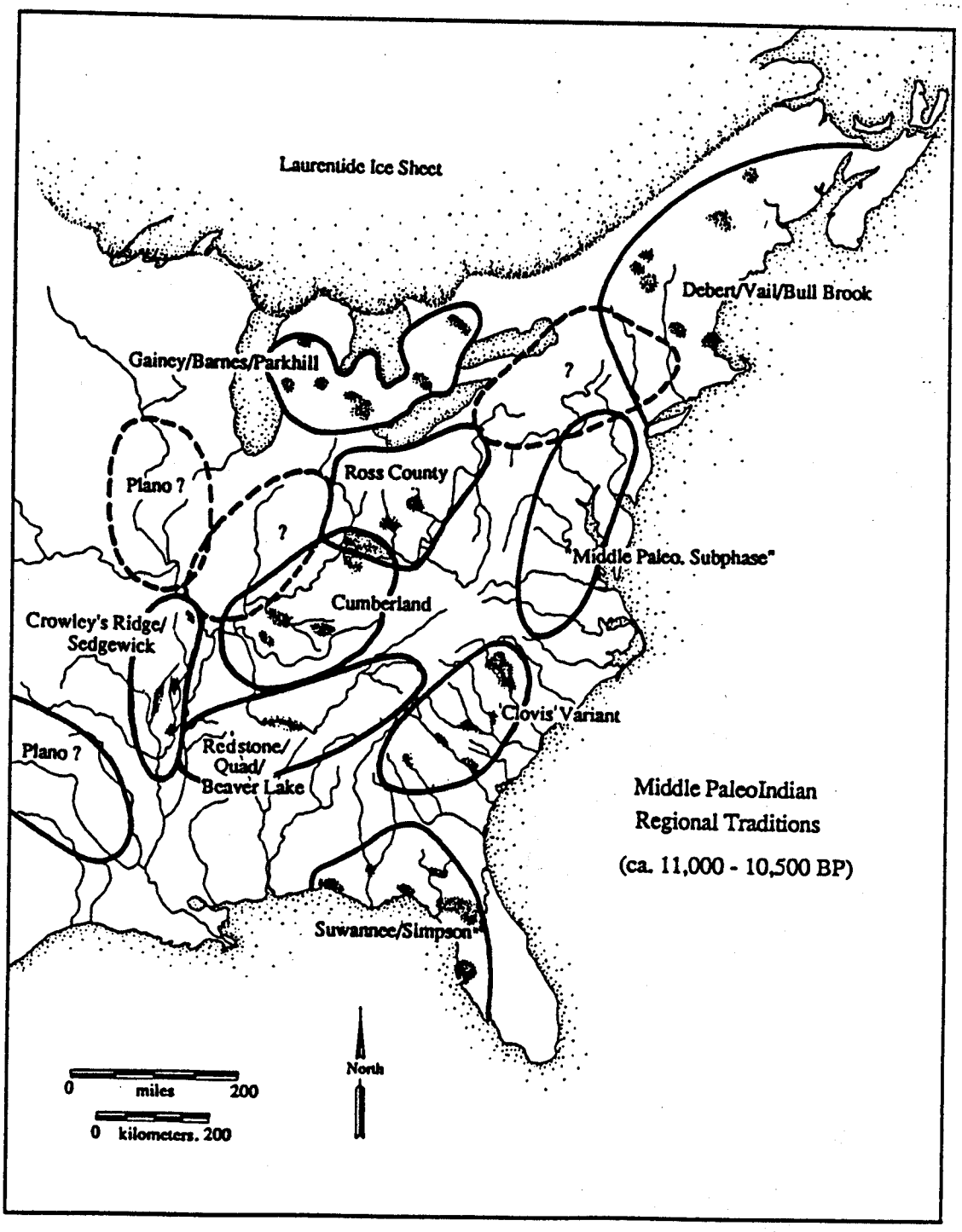

Figure 7. Middle Paleoindian Regional Traditions in Eastern North America

of the southeastern part of the state, in the Gulf coastal plain. A similar distribution is evident in Alabama, where over 90 percent of the reported Paleoindian points occur in the extreme northern part of the state, in and near the Tennessee River Valley (Futato 1982:31). The number of Paleoindian points reported from northern Alabama is enormous when compared with other parts of the Eastern Woodlands. Futato (1982) tabulated information on 1,546 points and estimated that this figure represented no more than one-fourth to one-half of the total points readily available for analysis.

The density of Paleoindian points in the central Tennessee River Valley is virtually unique within the Eastern Woodlands. Even more interesting is the fact that large numbers of artifacts have been recovered on individual sites, indicating intensive use of the area and running contrary to interpretations seeing the regional archaeological record as comprised primarily of isolated projectile point finds. For instance, over 200 fluted points have been recovered from the Quad locality in Limestone County, Alabama (Soday 1954, Cambron & Hulse 1960, Gustafson & Pigott 1981). Other major Paleoindian localities in northern Alabama include the Stone Pipe and Pine Tree sites (Cambron 1956, 1957, 1958). Around Coffee Slough and Seven Mile Island in Pickwick Lake, a comparable locality yielding large numbers of Paleoindian sites has been reported (Futato n.d.). These locations may represent habitation sites or centralized base camp areas within the inferred staging areas. In this view, the Early and Middle Paleoindian settlement of the Tennessee, Cumberland, and Ohio river valleys may have employed settlement strategies comparable to those inferred by Morse for Late Paleoindian Dalton groups, but on a much larger scale.

A high density of Paleoindian artifacts and sites in general is observed along the lower Ohio, Cumberland, and Tennessee rivers in the mid-South, perhaps because comparatively minor distances separate these major staging areas. In Tennessee, for example, a recent Paleoindian survey identified 58 sites yielding two or more diagnostics, mostly in the western and central part of the state (Broster 1989). The Wells Creek Crater site in the northwestern part of the state produced a large Early Paleoindian assemblage, including 18 fluted points (Dragoo 1973). At the Pierce site in west-central Tennessee on the South Fork of the Forked Deer River, Broster (1982) reported the discovery of eight Clovis, one Cumberland, and seven Plano-like forms and large numbers of associated tools atop a small knoll about 20m in diameter. Large numbers of fluted points are also reported from along the lower Cumberland in Kentucky, including over 100 points from Christian County alone (Rolingson 1964, Tankersley 1989). Major Early Paleoindian sites in the state have been summarized by Tankersley (1990); among the most prominent are Adams (Sanders 1983, 1988), Big Bone Lick (Tankersley 1985), and Parrish Village (Webb 1951).

Major fluted point concentrations are also evident in the central Ohio River Valley, where a major Early Paleoindian "staging area" was located, comparable to those postulated in the central Tennessee and lower Cumberland river

valleys. Two major concentrations are documented, one in south-central Ohio, in Adams and Ross Counties, where 158 points have been found, and the other near the headwaters of the Muskingum River in Coshocton County, in east-central Ohio, where 354 fluted points have been found (Seeman & Prufer 1982:165; Lepper 1986b:12). Empty areas in the Midwest comparable to those in the lower Southeast include the highly dissected Appalachian plateau and mountains of southeastern Ohio and adjoining West Virginia and eastern Kentucky, suggesting avoidance of mountainous areas (Rolingson 1964:72; Seeman & Prufer 1982:161; Lepper 1983:281–282, 1986c). Although Lepper (1983, 1985) has convincingly demonstrated that at least some of the fluted point distributional patterning in the Midwest is due to survey bias—specifically, where collectors operate and the degree of cultivation or exposed ground available for inspection—the general patterns appear robust and fairly representative (Seeman & Prufer 1984).

Sites in the central Ohio River Valley producing large numbers of fluted points and other Paleoindian materials, indicating intensive use of a particular locality, include: Welling in Coshocton County, with 54+ fluted points (Prufer & Wright 1970; Lepper 1986b, 1986c, 1988); Sandy Springs in Adams County, which has yielded 72 fluted points (Cunningham 1973, Seeman & Prufer 1982:157); and Nobles Pond in Stark County, which has yielded 13 points (Gramly & Summers 1986:120). Nobles Pond and Sandy Springs are thought to lie on or near major animal migration routes, and would have been favorable hunting stations (Seeman & Prufer 1982:158–159). The close proximity of the Upper Mercer flint deposits appears to have played a major role in the occupation of Welling, which has yielded appreciable reduction/manufacturing debris and has been interpreted as a workshop/habitation site (Lepper 1986c); the two other sites are somewhat removed from high-quality lithic raw material source areas.

Although fluted points are common along the Atlantic coast, they occur in low densities and with fairly even dispersion over large areas (Figure 2). The extent to which postglacial sea level rise has removed portions of the continental shelf from easy examination, of course, must make our inferences about human settlement in coastal areas tentative. The coastal plain does appear to have been avoided in some areas, though, such as eastern Georgia, northeastern South Carolina, and much of North Carolina, possibly due to a general absence of exploitable lithic raw materials (Gardner 1983). Two major and several minor concentrations are evident along the Atlantic seaboard, however, that may denote early staging areas. Large numbers of fluted points have been reported from the piedmont of northern North Carolina and southern Virginia (Perkinson 1971, 1973; Peck 1988; McCary, in MacCord 1982:36; McCary 1984, 1986, 1987, 1988), with the highest density being a cluster of some 200 fluted points in Granville County, North Carolina, and Mecklenberg County, Virginia. No major sites are reported from these counties, although the Williamson site, which has produced about 150 fluted points, is located some 60 km to the northeast in

Dinwiddie County, Virginia (McCary 1951, Peck 1985). This North Carolina/Virginia cluster is located near the course or headwaters of several major drainages—notably, the Roanoke, Meherrin-Chowan, Tar-Pamlico, and Neuse—and may represent either a staging area or a favored aggregation locus for peoples dispersed over a large portion of the Atlantic seaboard (McCary, in MacCord 1982:35).

A second major Early Paleoindian artifact concentration or, perhaps, two distinct minor concentrations, occurs in the northern part of the Atlantic seaboard, centering on the Plenge and Shoop sites in northern New Jersey and east-central Pennsylvania, respectively. Plenge has produced 131 Paleoindian points (Kraft 1973, Kraft et al. 1982), while some 58 points have been reported from Dauphin County along the Susquehanna River in eastern Pennsylvania, most from the Shoop site (Carr, in Kent 1982:39; Witthoff 1952). If these are indeed major concentrations, they are advantageously placed to exploit large areas of the Atlantic seaboard. Other presumed Early Paleoindian point concentrations occur in northwestern Florida along the Aucilla and Suwannee rivers (on the eastern Gulf Coast), in southwestern and central South Carolina along the Savannah and Congaree rivers, and along the Hudson River in east-central New York. The projectile point concentrations in the extreme upper Northeast, in New England and Nova Scotia, it should be noted, appear to be Middle Paleoindian or later in time and, thus, indicative of a later wave of settlement; the large sites/concentrations in this area may, however, also have served as staging areas of a sort.

A particularly striking aspect of the Early Paleoindian projectile point distribution over the Eastern Woodlands is the fact that neither the large nor the small concentrations occur in isolation, that is, within a single county. Instead, moderate numbers of Paleoindian points are also present in most surrounding countries, with county totals decreasing in incidence away from the central or core area. These distributions may document settlement/mobility ranges by groups occupying these areas. When the distribution of major and minor point clusters along the Atlantic seaboard is examined, another striking pattern that emerges is their regular spacing with respect to one another. Concentrations tend to occur at roughly 250–400 km intervals, a tendency that remains evident although somewhat distorted when distributions over the entire Eastern Woodlands are considered. The presence of discrete Paleoindian groups, probably band-level and possibly incipient macroband-level entities, may be indicated. These may be the nuclei from which later regional traditions emerged (Figures 2, 6, 7). Thus, the regional Early Paleoindian archaeological/distributional record appears to provide clues as to how Middle and Late Paleoindian regional traditions came about.

In summary, major concentrations of Early Paleoindian artifacts in the Eastern Woodlands are interpreted here as staging areas, while the much lower occurrence of classic fluted points over the surrounding region reflect the activities of exploration or hunting parties or fission groups from these areas. The emergence

of regional traditions later in the Paleoindian period appears to have begun with the spread of Paleoindian groups away from staging areas, and their subsequent development in relative isolation. Examples of later Paleoindian regional traditions include the Suwannee/Simpson cluster in Florida and south Georgia, the Cumberland cluster in the mid-South, the Holcombe-Barnes cluster from Michigan, and the Bull Brook-Vail-Debert cluster in the extreme Northeast (Figure 7).

ECOLOGICAL CONSIDERATIONS

During the Late Glacial era between 15,000 and 11,000 BP, sea levels were 70m or more lower than at the present, and the Atlantic and Gulf shorelines were considerably seaward of their present location. As the continental ice sheets retreated in the north, water was returned to the oceans and large sections of the continental shelf were inundated. By 9000 BP sea level was within about 10–12m of its present stand. Widespread extinctions accompanied these environmental changes in North America, entailing the loss of 33 genera of large mammals, including the Equidae and Camelidae (horses and camels) and all the members of the order Proboscidea (elephants) (Martin 1984:361–363). Contemporary analyses indicate that these extinctions were complete by ca. 10,000 BP and possibly as early as 10,500 BP (Grayson 1987, Mead & Meltzer 1984:447), shortly after widespread evidence for human settlement appears in the New World archaeological record. The relationship between these human and animal populations is a matter of considerable controversy (Martin & Klein 1984). While human predation of megafauna has been conclusively demonstrated at a number of locations, most notably in the Southwest and on the Great Plains, to date only minimal evidence for megafaunal exploitation has been recovered from the eastern United States (Clausen et al. 1979, Webb et al. 1984).

Recent broadscale paleoenvironmental analyses from the lower Southeast indicate that major changes have occurred over the last 15,000 years. In particular, the period from 12,000 to 10,000 BP—the time of postulated initial human colonization—was one of great change, as "the relatively patchy environment was shifting to one of latitudinally and elevationally segregated zones" (Kelly & Todd 1988:232). The regional vegetational matrix during this period was rapidly changing, from a patchy boreal forest/parkland towards a homogeneous, mesic oak-hickory forest (Delcourt & Delcourt 1985, 1987; but see also Webb et al. 1987) (Figure 8). In ecological terms, the vegetation was changing from immature (coarse-grained) to mature (fine-grained) in structure (Pianka 1978). The best available evidence suggests that this transition was complete over much of the region by shortly after 10,000 BP and almost certainly by 9000 BP (Watts 1971:687, 1980:195; Delcourt & Delcourt 1983:269, 1985:19; Davis 1983: 172–173; Larsen 1982:208–222).

South of 33° N latitude there is evidence to suggest that a hardwood canopy was in place considerably earlier, perhaps throughout much of the previous

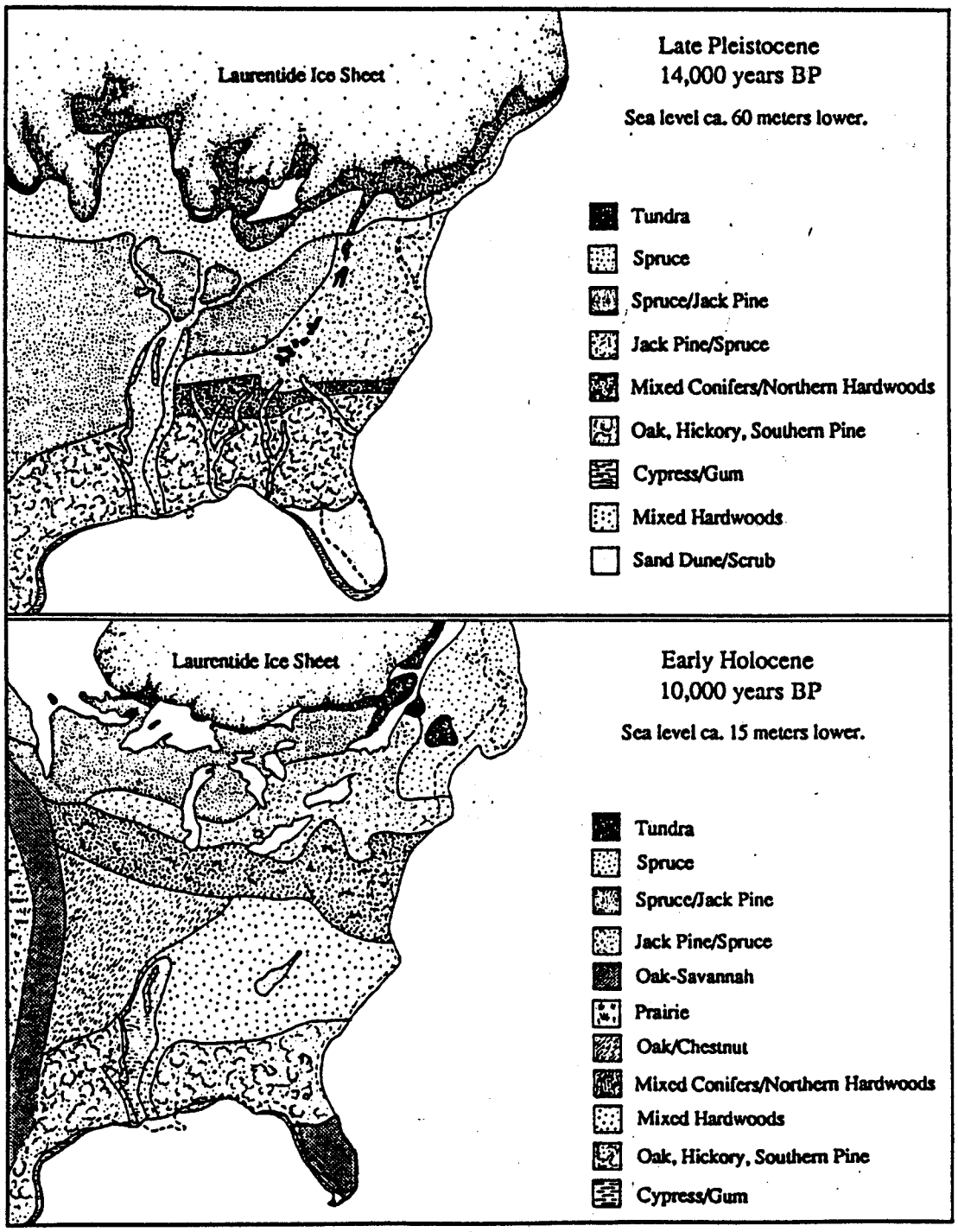

Figure 8. Reconstructed Paleovegetational Communities in the Southeast at 14,000 BP and 10,000 BP (Source: Delcourt & Delcourt 1983:148–149)

glacial cycle (Delcourt & Delcourt 1983, 1985, 1987). Although traditionally viewed as a time of major paleoenvironmental change, the late Pleistocene/early Holocene in the lower Southeast (prior to the Hypsithermal Interval) appears to have been characterized by stable regional oak-hickory vegetational communities (Figure 8). Only during the mid-Holocene Hypsithermal Interval, from ca. 8,000–4,000 BP, did southern pine communities begin to emerge in the sandy interriverine uplands; this was also the period when extensive riverine swamps began to emerge (Delcourt & Delcourt 1983, 1985, 1987; Delcourt et al. 1983; Davis 1983; Knox 1983; Brooks et al. 1986).

In recent years, it has become evident that biotic resource structure strongly influenced prehistoric technological organization and mobility strategies. This has been explicitly documented on both a global scale (Binford 1980, Kelly 1983, Shott 1986b) and within the lower Southeast itself (Cable 1982, Anderson & Hanson 1988). The patchy forest structure extant during the Late Pleistocene north of the Gulf and lower South Atlantic coastal plain would have been appropriate for logistically-based adaptations like those postulated for the initial Paleoindian groups. The comparative absence of Early Paleoindian diagnostics in the mixed hardwood canopy to the south, in contrast, might be expected, since these groups were not technologically and organizationally adapted for exploiting such an environment. The homogeneous forest cover in this area would have been more conducive to foraging adaptations (*sensu* Binford 1980). As the hardwood canopy expanded from its refugia in the lower Southeast and resource structure changed throughout the region, such an adaptation may have been literally forced upon the resident human populations.

EVIDENCE FOR POPULATION INCREASE IN THE LOWER SOUTHEAST

Examining the occurrence of Paleoindian and Early Archaic diagnostics at a number of locations across the Southeast may indicate the extent to which population growth was occurring during these periods (Table 3, Figure 9). Population growth over time is clearly suggested in Mississippi, for example, where there is evidence for at least a doubling of diagnostic projectile points between the Early and Middle and the Middle and Later Paleoindian periods (McGahey 1987:11). In the nearby Cedar Creek Reservoir in northwest Alabama, Futato (1983:183–184) recorded three Early Paleoindian Clovis points, 11 presumed Middle Paleoindian unfluted lanceolates, and 13 Late Paleoindian Dalton points. Early Archaic materials were particularly common in the Cedar Creek Reservoir, with 34 Big Sandys and 46 Kirk Corner Notched points reported. This evidence suggests that pronounced population increase was occurring between the Early and Middle Paleoindian periods and between the Late Paleoindian and Early Archaic periods in the lower Mid-South.

Table 3. Evidence for Population Increase in the Southeastern United States: Counts of Diagnostic Artifacts by Period[a]

Locality	*Early Paleoindian*	*Middle Paleoindian*	*Late Paleoindian*	*Side Notched*	*Corner Notched*	*Reference*
Cache River, AR	2*	n/a	50*	n/a	n/a	Schiffer & House 1975:151
Cedar Creek Reservoir, AL	3	11	13	34	46	Futato 1983:183–184
Congaree Creek, SC	ca. 10	n/a	29	27	398	Charles n.d.
Feronia Locality, GA	4	n/a	18	n/a	102	Blanton & Snow 1986, 1989
Fort Polk, LA	3	14	29	n/a	n/a	Anderson et al. 1988
L'Anguille River, AR	1	–	20	n/a	n/a	Anderson, Delcourt et al. 1989
Mississippi	68	174	387	n/a	n/a	McGahey 1987:11
Russell Reservoir, GA/SC	3	–	14	n/a	129	Anderson & Joseph 1988:25
Savannah River Plant, SC	2	2	6	16	98	Hanson et al. 1978
Wallace Reservoir, GA	4	n/a	32	102	192	O'Steen 1983:114

[a]Entries marked with asterisk (*) denote numbers of sites. Unmarked entries represent numbers of artifacts.

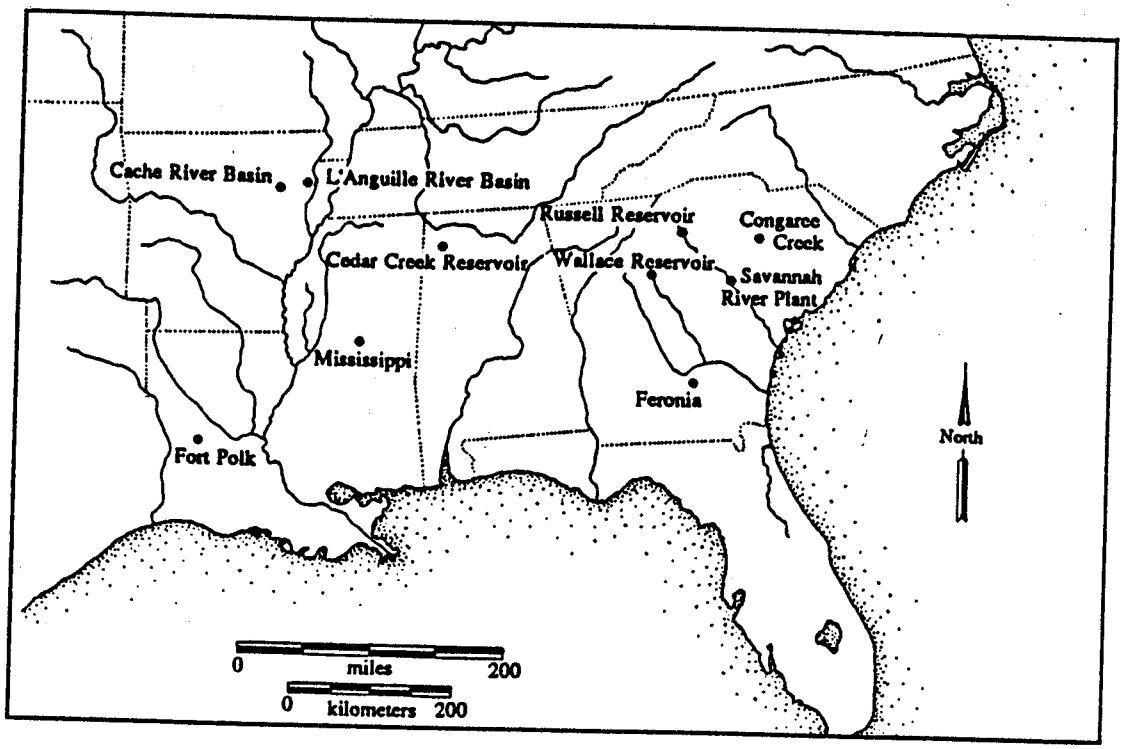

Figure 9. Localities with Evidence for Paleoindian through Early Archaic Period Population Increase in the Lower Southeast, Measured on Diagnostic Projectile Points

Similar trends within the Paleoindian period itself are evident in northeast Arkansas, where data are available from two major surveys, within the Cache and L'Anguille River basins (Schiffer & House 1975; Anderson, Delcourt et al. 1989). In the Cache River Basin survey, where data were recorded at the site level, two Paleoindian and 50 Dalton sites were recorded (Schiffer & House 1975:151). In the L'Anguille River Basin survey, 219 prehistoric sites were found within about 200m of the channel. A total of 288 hafted bifaces could be assigned to a specific cultural-historical type (Anderson, Delcourt et al. 1989:96). These included a single Clovis base and 20 Dalton points, indicating appreciable Paleoindian or, at least, Late Paleoindian occupation within the basin. The ratio of Clovis to Dalton points from the L'Anguille was 1:20, comparable to the 1:25 ratio observed in the Cache collections. The largest incidence of Dalton points found along the L'Anguille came from near the center of a Dalton site concentration initially documented during the 1961 Ford-Redfield survey (Redfield 1971), where Morse (1977) had posited that a Dalton band had resided.

In west-central Louisiana, collection from 1,454 prehistoric sites on the Fort Polk Military Reservation provide another large sample that can be used to examine population trends during these early periods. Paleoindian components tended to be fairly common on Fort Polk, although they were decidedly infrequent when compared with subsequent periods (Anderson et al. 1988:198).

Three early Paleoindian Clovis points were reported at one site, Eagle Hill II (Gunn & Brown 1982), 14 Middle Paleoindian points were observed on 11 sites, and 29 terminal Paleoindian/initial Early Archaic San Patrice components were noted on 25 sites. The progressive increase from the Early to the Late Paleoindian in numbers of sites and components probably reflects regional population increase as well as greater use of the interriverine uplands, the setting for much of the data base. While Early Paleoindian occupation was noted only near Eagle Hill, Middle and Late Paleoindian components are found in a number of areas and microenvironmental settings. The occurrence of a prominent cluster of Paleoindian sites near Eagle Hill may reflect group aggregation or rendezvous at a prominent landmark.

Evidence for major population increase from the Early Paleoindian period through the Early Archaic is also indicated from five different localities in Georgia and the Carolinas: (1) the Wallace Reservoir in the central Georgia piedmont (O'Steen 1983, O'Steen et al. 1986), (2) the Department of Energy Savannah River Site in the inner coastal plain of South Carolina (Hanson et al. 1978, Sassaman n.d.), (3) the Richard B. Russell Reservoir along the upper Savannah River in the central Georgia and South Carolina piedmont (Anderson & Joseph 1988), (4) the Feronia locality in south-central Georgia (Blanton & Snow n.d.a., n.d.b), and (5) the Congaree Creek locality on the fall line in central South Carolina (Anderson 1979, n.d.). At all of these localities, major increases in the numbers of observed diagnostics are evident between the Early and Late Paleoindian periods, and again from Late Paleoindian Dalton to the Early Archaic side- and corner-notched forms. These increases may reflect changing technologies as well as population growth, since Dalton and Early Archaic hafted bifaces appear to have seen extensive use as multipurpose tools, more so than earlier fluted and unfluted lanceolate forms in the region. If these data do in some way reflect regional population levels, they suggest that major population growth was occurring and that considerable landscape filling had occurred by the start of the Early Archaic period.

EVIDENCE FOR GROUP MOBILITY IN THE LOWER SOUTHEAST

Increasing use of local raw materials over the course of the Paleoindian period is well-documented from a number of localities in the southeastern United States, a trend that is widely interpreted as reflecting decreasing group mobility (see Anderson 1988; Goodyear et al. 1985, 1989; Meltzer 1988). This patterning is particularly well-documented in Mississippi (McGahey 1987:11–12). Extralocal materials dominate the Early Paleoindian assemblages from this state, with Fort Payne chert from the Tennessee River Valley most common (N=22 points), followed by a high-quality blue-green flint (N=6 points). The possibility that the blue-green material was Banger flint from northern Alabama was considered

unlikely, since the artifacts made of it were found on streams that drained into the Mississippi rather than into the Tennessee (McGahey 1987:3, 12). Almost all of the Early Paleoindian hafted bifaces found to date in the state (N=28, 84.8%) are made of one of these two materials. Extralocal raw material use declines in the subsequent Middle and Late Paleoindian periods, where it accounts for 17.24 and 4.7 percent of the assemblages, respectively. McGahey (1987:1) has used these data to suggest that "the state was initially populated from the Tennessee River Valley to the northeast," with some early settlement deriving from the Ohio Valley, as well. These inferences are in agreement with the colonization model advanced here.

Analyses of raw material sources for Paleoindian hafted bifaces in collections from across the region indicate riverine-extensive or, at least, geographically wide-ranging adaptations (see Anderson et al. 1990, Charles 1986, Goodyear et al. 1984, Meltzer 1988, Shott 1986a; Tankersley, this volume). Lithic raw materials occur at distances up to 300 km from their source areas on some sites. A gradual rather than a dramatic or step-like fall-off in the occurrence of lithic raw materials is indicated, suggesting minimal social boundaries; similar findings were observed by Tankersley (1989) on Early Paleoindian materials from the Ohio and Cumberland drainages. Evidence for raw material or finished artifact exchange is completely lacking. The assemblages recovered to date, even at quarry sites, suggest routine toolkit maintenance, discard, and replenishment ("gearing-up") activity, rather than production for exchange.

Kelly and Todd (1988:234–235, 239) have recently argued that Paleoindian groups were "technology-oriented" rather than "place-oriented" and that the highly uniform toolkit characteristic of assemblages from this period over much of the continent reflected a specific, highly-mobile hunting adaptation focused on the behavioral characteristics of particular prey species, presumably megafauna. The combination of human predation and rapidly changing environmental conditions would have led to the rapid (localized) depletion or depression of these key species, however, necessitating frequent group movement to more favorable resource patches. Such a highly-mobile adaptive strategy, in their view, would preclude extended settlement in any given area; "instead, Paleoindians probably shifted their territories frequently as large Pleistocene fauna changed their composition and distribution" (Kelly & Todd 1988:234).

Even accepting the technological orientation of Early Paleoindian populations, which appears valid and unarguable, it is difficult to accept that these people would not quickly become place-oriented, especially given their presumed highly-mobile lifestyle. Given high mobility and low population density, familiarity with places on the landscape—particularly areas with extensive, high-quality raw materials (i.e., quarry/outcrop areas), extensive exploitable biotic resources (i.e., animal migration routes), or prominent physiographic features facilitating population rendezvous and aggregation for information exchange and mating

network/population maintenance—would appear to be a critical and not merely incidental aspect of Paleoindian life.

An association of major Paleoindian fluted point artifact and site concentrations with dramatic, easily relocatable features within the landscape is reported from across North America (Goodyear et al. 1989, Judge 1973:330, Wilmsen & Roberts 1978). The association of fluted point concentrations and major high-quality lithic raw material sources has also been widely noted in eastern North America, prompting the inference that Early Paleoindian populations were somehow "tethered" to these source areas, which supposedly served as central places constraining mobility (see Gardner 1974, 1977; Goodyear 1979; Seeman & Prufer 1982:158). In the southeastern United States, examples of possible Paleoindian aggregation loci associated with prominent locations on the landscape include the Eagle Hill locality in west-central Louisiana, Wells Creek Crater in Tennessee, the Feronia locality in south Georgia, and literally dozens of fall line locations on the Atlantic and Gulf slopes.

Eagle Hill in west-central Louisiana is one of the highest points in the immediate region, a position further enhanced by the fact that it lies at a divide between three major river systems, the Sabine, Calcasieu, and the Red (Gunn & Brown 1982:127). Occupying a commanding position in the regional landscape, its visibility would have facilitated population rendezvous throughout prehistory. The locality has yielded a number of Paleoindian and Early Archaic components and appears to have served as an aggregation locus for populations from over a wide area (Gunn & Brown 1982, Anderson et al. 1988:60). The Feronia locality in south Georgia occurs in a similar, geographically propitious position along a major river system, the Ocmulgee, near the divide between the Atlantic and Gulf watersheds (Blanton & Snow n.d.a., n.d.b). Finally, proceeding upriver from the coast, rocks first appear in river channels at fall line areas throughout the region. The occurrence of major sites and site clusters in these kinds of settings is common during earlier periods, when periodic rendezvous between groups for socializing as well as for obtaining marriage partners was probably a critical aspect of mobility (Anderson & Hanson 1988). Thus, the presence of large numbers of Paleoindian and Early Archaic sites in such settings should come as no surprise, and it suggests that these populations were indeed "place-oriented."

Finally, if Late Pleistocene target fauna were, as Kelly and Todd (1988:235) suggest, "regionally abundant, but locally unpredictable," it is questionable whether a high-mobility adaptation would be the most effective method of exploitation. Given a patchy and unpredictable regional resource structure, as is inferred for the region north of about latitude 33° around 11,000 BP, such a strategy would make very little sense. Logistically-based exploitation of the surrounding terrain from central camps would be a much more efficient strategy (Anderson & Hanson 1988:264–266, Heffley 1981, Wilmsen 1973). Kelly and Todd (1988:253) suggest that the only options available to Paleoindian popula-

tions when local resources were depleted were to switch prey species or relocate, with movement over appreciable distances inferred. It is doubtful whether Paleoindian populations could quickly exhaust the resource potential of the central Ohio, Cumberland, and Tennessee river valleys, which remained occupied at progressively higher population levels throughout subsequent portions of prehistory. While some small-scale movement undoubtedly occurred as local resources became depressed, relocation over long distances would in all probability have been unnecessary. Staging areas—where initial Paloeindian occupants could concentrate and, if necessary, return to if exploration/colonization ventures to other parts of the region failed—were an alternative and seemingly more plausible settlement option open to Paleoindian populations.

CONCLUSIONS

A primary goal of economic anthropology is "to discern and objectify the mechanisms of human adaptation" (Isaac 1988:6), specifically, how processes of production, consumption, distribution, and exchange interact to shape patterns of settlement and subsistence. This perspective has been used here to examine how the initial human settlement of Easter North America may have taken place. Paleoindian artifact distributions from the Eastern Woodlands indicate the probable process by which the colonization of the region occurred: (1) the founding populations entered the region from the west and filtered into the Ohio, Cumberland, and Tennessee river valleys, where regrouping occurred, coupled with the beginnings of exploration and settlement throughout the region; (2) from this base, circumscribed regional or subregional populations, exemplified archaeologically by distinctive stylistic traditions, eventually emerged across much of the landscape. Population increase during the Middle and Late Paleoindian periods was apparently extensive, as suggested by the relative numbers of diagnostic projectile points found in given areas.

The large numbers of fluted points found in the Eastern Woodlands, and specifically in the Southeast, has prompted some investigators to suggest that the technology arose in this region (Mason 1962:234–235, Brennan 1982:27–28). While this conclusion remains controversial, a North American origin for the distinctive Paleoindian fluting technology is generally accepted (Haynes 1987). The present model can do little to resolve the issue of where this technology arose, except to note that the continental drainage patterns suggest that the Eastern Woodlands were almost certainly settled early in the Paleoindian era. Artifact distributions, furthermore, indicate that the central portion of this region, specifically the Tennessee, Cumberland, and Ohio river valleys, were staging areas from which populations and, possibly, technological innovations could have spread.

The concept of staging areas offers several things conspicuously lacking in

most discussions of eastern Paleoindian settlement to date, specifically, the means by which Early Paleoindian populations could familiarize themselves with the resources in their surroundings, obtain a measure of social stability and security, and ensure their reproductive viability while simultaneously maintaining a high reproductive rate. Population growth would be facilitated through the reduction of female mobility and, presumably, the improvement in diet that would come from the use of a logistical hunting-gathering strategy, a form of technological organization appropriate to the patchy regional resource structure. The relative permanence of the staging areas themselves would facilitate population aggregation and the concomitant development of mating and information networks. They additionally would provide jumping-off places for exploring or colonizing parties, who would know that, in the event of the deaths of several individuals or failure to locate exploitable habitats, surviving individuals would at least have the option of returning to an area where other human beings were present. How actual exploration and colonization proceeded from staging areas (i.e., the number and composition of the groups) and how far they may have traveled remains unknown. No doubt, some early groups were successful while others died out.

Analyses of Paleoindian assemblages from the lower Southeast indicate that large numbers of isolated artifacts are present in the region, together with lesser numbers of site assemblages suggesting the presence of base camps, foraging camps, and special-purpose resource extraction stations. Details about matters such as season and duration of site use, specific activities undertaken, or the size of the resident groups are scarce, however, and must await larger excavations, the recovery of floral and faunal remains (or other seasonal indicators), and the continued development of analytical strategies and theoretical models. Perhaps the most crucial and immediate task facing researchers is the documentation of their data base. While thousands of Paleoindian artifacts are reported from the Eastern Woodlands, primary data remain elusive on all but a tiny fraction of this material. The development of state and regional Paleoindian data bases, and the publication of this information, will be an essential task in the years ahead.

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The distribution of Early and Middle Paleoindian projectile points in eastern North America, illustrated in Figure 2, was compiled from county/parish level totals of fluted points from each state or province, where such data were available. This information was provided by Paleoindian researchers from many states, and the primary sources of this material are acknowledged in Table 1. In particular, I thank the following individuals for supplying me with primary data: Tyler Bastian, Dan Bloemker, Mark J. Brooks, John B. Broster, James S. Dunbar, Eugene Futato, William M. Gardner, Brad Koldehoff, Dan F. Morse, Philip "Duke" Rivet, Kenneth B. Tankersley, and Henry T. Wright. The resulting data base, maintained on an Apple MacIntosh 800k diskette, is available to

researchers on request. The file gives the numbers of Paleoindian points, by type (where such data are available), for each county or parish in each state or province in Eastern North America. Bibliographic references accompany each entry, documenting the sources of the data. Researchers wishing a copy of this database should send me a blank 800k 3.5" diskette. I am also compiling measurements on individual Paleoindian artifacts from across the region and information on specific site locations, specifically site UTM and state number data. Researchers wishing to contribute their own data to this effort, for incorporation into the regional database, are encouraged to do so.

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