

Pleistocene Human Occupation of the Southeastern United States: Research Directions for the Early 21st Century

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Abstract

Paleoindian research effort in the Southeast and beyond in the years to come should be directed, as much as possible, to primary data collection, both through fieldwork and laboratory analyses; absolute and relative dating of artifacts and assemblages; the use of calibrated or calendar dates; the increasing adoption of multidisciplinary research approaches; the development of well-grounded models; and the full publication of the results of current and past fieldwork. The reward structure of the archaeological profession, in academia and beyond, should be refocused to emphasize the production of comprehensive site reports and interpretive analyses employing large data sets, not the fragmentation of results into a myriad of preliminary papers or journal articles. New research and researchers should be welcomed and encouraged by members of the existing regional professional community working on the Paleoindian era. The Southeast has long prided itself on maintaining a tradition of careful fieldwork, sound linkages between primary data and interpretations and models based on that data, and an openness and hospitality among the members of its research community. These characteristics are ideally suited to furthering Paleoindian research in the 21st century, both in the Southeast and throughout the Americas.

Introduction

The southeastern United States has a rich and varied archaeological record encompassing the period prior to 11,425 CALYBP/10,000 RCYBP, during what has traditionally been called the Paleoindian or late-Pleistocene era. This record has been summarized at length in a number of recent publications (Anderson 1990, 2001, 2003;

Anderson and Sassaman, eds., 1996; Dincauze 1993a; Ellis et al. 1998; Goodyear 1999a; Lepper and Meltzer 1991; Mason 1962; Morse et al. 1996; Williams and Stoltman 1965). In this paper, rather than repeat this existing information, I look at the state of current research and offer suggestions about what we should be doing to better understand the initial human occupation of the region. These suggestions are intended to guide and not strait-jacket or constrain research in the Southeast in years to come. I have no doubt that exciting discoveries will occur and that new models and approaches will be developed that are completely unanticipated here. That is as it should be, and is, after all, what makes archaeology such an exciting field. Just as we often don't know what we will find when we dig, so too are we frequently surprised at where our analyses and modeling take us. Those measures proposed here, for the most part, are things that regional Paleoindian specialists are well aware need doing. My purpose, however, is to emphasize how wide open the opportunities are and to foster greater interest and participation in local research. Many of the observations advanced here for the Southeast, furthermore, are likely to prove equally valid in other areas.

First and foremost, increased effort needs to be devoted to primary data collection, both through fieldwork directed to the discovery of early sites as well as analyses directed to examining and recording existing collections. Second, the absolute and relative dating of early artifacts and assemblages from this period should be emphasized. Third, when referring to time, calibrated or calendar dates should be universally adopted and incorporated into models of culture change. Fourth, when evidence for early occupations is detected, multidisciplinary research teams need to be brought to bear in their interpreting and dating. The research programs undertaken at pre-Clovis-era sites like Cactus Hill and Topper, or at later Paleoindian sites like Dust Cave and Big Eddy, serve as models of this kind of multidisciplinary approach. Fifth, developing models of what the Paleoindian archaeological record means in terms of human behavior and adaptation should be encouraged; but above all, these models should

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be well grounded, that is, tied to existing data. Finally, full publication of the results of both field and laboratory studies should be encouraged; and where earlier work has not been adequately reported, every effort should be made to see that this is done.

Enlarging the Primary Database

More effort needs to be directed to locating and collecting primary data across the region through surveying, excavating, and analyzing existing collections, both from earlier investigations and in private hands. We need to dig deeper and in places informed by geoarchaeological research if we are to find well-preserved assemblages, particularly those dating to the early Paleoindian or pre-Clovis era (Goodyear 1999a). Submerged and wet-site archaeology should receive increasing attention, both as a means of determining the archaeological record on the continental shelf (Faught 1996, 2004; Faught and Donoghue 1997; Faught et al. 1992) as well as in the hope of recovering perishable artifacts and human remains, as has occurred in Florida at the Little Salt Spring and Page-Ladson sites (e.g., Clausen et al. 1979; Dunbar et al. 1988).

Fluted-point surveys across the region need to be established or reinvigorated. While compilations of primary data exist from every Southern state, only in Virginia at present is there an active Paleoindian artifact recording project in which primary data are regularly and systematically published. This is, of course, the fluted-point survey project initiated by McCary (1984, 1991) in the late 1940s and carried on in recent years by Johnson and Pearsall (e.g., 1993, 1995, 1996) and Hranicky (2004). To date, attribute data (e.g., metric measurements, raw material type, color, presence or absence of grinding, etc.) on over 1,000 fluted points from Virginia have been published, a figure that encompasses just under 10 percent of all the fluted points known from the entire country at present, at least as presently compiled (Anderson and Faught 1998, 2000; see Shott 2002 for an excellent critique of the strengths and weaknesses of these kinds of compilations). If the professional or avocational communities in every state were as conscientious as they are in Virginia, we would have a much better understanding of the range of variation within these early artifacts and their location on the landscape.

More work on compiling and recording data on primary artifacts is needed in the Southeast; ideally, work should go beyond fluted points to encompass first all Paleoindian point forms, and then other tool forms and assemblage characteristics. Fortunately, data on Paleoindian artifacts, typically fluted points, are presently being conscientiously recorded by individuals in many Southeastern states. In a few states, notably Georgia, Mississippi, and Tennessee, these surveys encompass all Paleoindian point types. Only rarely, however, has any of this primary data been fully published, although all current researchers are very generous in sharing their primary data records. Publishing primary data should be encouraged, however, to avoid the loss of this information in the future. Interestingly, when such reports or papers appear they tend to become instant classics, since they typically provide some of the only readily accessible primary data on Paleoindian materials from the state in question (e.g., Ander-

son et al. 1990; Dunbar 1991; Dunbar and Waller 1983; Gagliano and Gregory 1965; Goodyear et al. 1990; McGahey 1996; Rolingson 1964; Rolingson and Swartz 1966; Tankersley 1990; Wittkofski and Reinhart, eds., 1989).

The reanalysis, or in some cases initial analysis, of older excavation assemblages is another area where important research should be accomplished. Some classic Paleoindian sites in the region have either been minimally reported or were reported so long ago that reanalysis can prove rewarding. This has been demonstrated with materials from the late-Paleoindian Hardaway site in North Carolina, for example, which was excavated from the 1940s through the 1980s. Materials from this site helped define the basic late-Paleoindian through Archaic regional cultural sequence (Coe 1964) and, more recently, the associated toolkits and possible settlement strategies of the site's early occupants (Daniel 1998). Reanalyzing materials from sites such as Stanfield-Worley Bluff Shelter in Alabama (DeJarnette et al. 1962), Silver Springs in Florida (Neill 1958), or Parrish Village in Kentucky (Webb 1951), to cite other possible examples, would unquestionably yield new insights.

The early assemblages found at Macon Plateau in the 1930s by New Deal-era archaeologists, including the first Clovis fluted point found in stratified context in the Southeast and recognized for what it was, have never been systematically described; only a few pages in a preliminary report on the investigations discuss these early materials (Kelly 1938:2-5). The collections from Macon Plateau are maintained at the Southeast Archeological Center, however, and have been undergoing re-cataloguing for several years now. From casual inspection of the materials in that laboratory, I know that dozens of Dalton and early side-notched points are present in the collections, as well as hundreds of unifacial and bifacial tools, including at least one Dalton adze. The provenience data for these materials are not the best in some cases—for many artifacts, intrasite provenience data are unknown or ambiguous, and some early artifacts occurred in later Mississippian-era mound fill and hence are clearly redeposited. Nonetheless, the collection is a superb example of the kind of early assemblages that can occur in a Fall Line setting in this part of the region.

Increasing the Use of Absolute Dating Procedures

Compared with the cost of excavating, absolute dating is relatively inexpensive. A variety of procedures can be used, including conventional radiocarbon dating, accelerator mass spectrometry (AMS) radiocarbon dating, thermoluminescent dating (TL), optically stimulated luminescence dating (OSL), and a comparatively new procedure, oxidized carbon ratio dating (OCR; see Frink 1992, 1994, 2004; but see also Killick et al. 1999). As recent research at Topper, Coats-Hines, Cactus Hill, and Saltville has shown, use of multiple dating techniques can be an invaluable means of assessing the integrity and age of site deposits when collected as part of a multidisciplinary research effort. Three of these sites contain early-Paleoindian (i.e., pre-Clovis) remains, and the use of multiple dating techniques increases confidence

that the deposits and associated artifacts date to this period (Goodyear 2004).

At the Topper site in South Carolina, for example, Goodyear has used AMS and OSL dating to bracket the age of a possible pre-Clovis lithic assemblage, which occurred in alluvial sands situated above a gray clay and below a thick layer of colluvium. Two AMS dates obtained on humic acids from beneath the gray clay were $19,280 \pm 140$ RCYBP/22,470–23,261 CALYBP (CAMS-59593) and $20,860 \pm 90$ RCYBP/beyond current calibration curve CALYBP (CAMS-58432) (Goodyear 1999b:10), while OSL dates ranged from ca. 13,000 to 14,000 CALYBP at the base of the colluvium, and from 15,000 to 16,000 CALYBP in the top of the alluvial sand layer (Goodyear 2000, 2004). These dates suggest the archaeological remains encountered in the alluvial sands date to at least 15,000–16,000 CALYBP, appreciably pre-Clovis, and possibly earlier than ca. 23,000 CALYBP, the age of the gray clay. The samples were collected as part of an extensive program of geoarchaeological and paleoenvironmental research that complements the archaeological investigations.

At Coats-Hines (40Wm31), an apparent kill site in Tennessee, 10 chert tools and 24 flakes were found with the remains of a disarticulated mastodon. Butchering marks and other evidence of human modification are apparent on a number of bones, and the tip of a bone projectile point was found between the ribs of the mastodon (Breitburg et al. 1996; J. Broster pers. comm. 2000). Four OCR dates have yielded an age around 13,000 CALYBP, comparable to calibrated radiocarbon dates for Clovis. A radiocarbon date of $27,050 \pm 200$ RCYBP/beyond current calibration curve CALYBP (Beta-80169) was obtained from the base of the deposits at the site, below the cultural level. A second date, on material from within the dental cusps of the mastodon, was 6530 ± 70 RCYBP/7334–7554 CALYBP (Beta-75403) (Breitburg et al. 1996:7). An AMS date on materials from the bone bed yielded a date of $12,030 \pm 40$ RCYBP/13,823–14,290 CALYBP (Beta-125350) (J. Broster pers. comm. 2000).

At Cactus Hill in Virginia, a number of conventional and AMS radiocarbon determinations have been run on material from pre-Clovis deposits located in a sand dune setting (McAvoy and McAvoy 1997:124, 167, 169). Small blades, polyhedral blade cores, retouched flakes, and abrading stones have been found at the site stratigraphically below a well-defined Clovis occupation. The assemblage was documented in two separate areas, in excavations by two different teams of researchers, led by Joseph and Lynn McAvoy and Michael F. Johnson (Johnson 1997; McAvoy and McAvoy 1997). Two unfluted lanceolate/triangular bifaces, which McAvoy and McAvoy (1997:136) have called early Triangular, occurred in the pre-Clovis deposits. Seven quartzite flakes and three quartzite blade cores were found in and near an amorphous hearth-like scatter of white pine charcoal that yielded an AMS radiocarbon determination of $15,070 \pm 70$ RCYBP/17,743–18,298 CALYBP (Beta-81590) (McAvoy and McAvoy 1997:167). Three additional early dates ($16,670 \pm 730$ RCYBP/18,968–20,756 CALYBP [Beta-97708], $16,940 \pm 50$ RCYBP/19,854–20,492 CALYBP [Beta-128330], and $19,700 \pm 130$ RCYBP/22,976–23,717 CALYBP [Beta-128331]) and two anomalously

recent dates, 9250 ± 60 RCYBP/10,277–10,501 CALYBP (Beta-93899) and $10,160 \pm 60$ RCYBP/11,571–12,060 CALYBP (Beta-92923), have also been obtained on charcoal from the pre-Clovis levels (McAvoy et al. 2000). The $16,670 \pm 730$ and $16,940 \pm 50$ RCYBP dates are from hearth areas, while the $19,700 \pm 130$ RCYBP date is near the base of the dune, below the cultural levels. The overlying Clovis assemblage is well defined, with numerous points and tools, and a hearth-like scatter of Southern pine charcoal from the same level has been radiocarbon dated to $10,920 \pm 250$ RCYBP/12,436–13,183 CALYBP (Beta-81589) (McAvoy and McAvoy 1997:124, 167, 169).

AMS and conventional radiocarbon dating have also been used with great success in the pre-Clovis levels at the Saltville site in Virginia (McDonald 2000:8, 37–46). Three artifact-bearing horizons were recognized, dating from roughly 14,500, 13,900, and 13,000 RCYBP/17,365, 16,675, and 15,636 CALYBP (McDonald 2000; see also Goodyear n.d.). Collagen from a fractured and apparently use-worn tibia of a probable musk ox (*Bootherium bombifrons*) was AMS dated to $14,510 \pm 80$ RCYBP/17,112–17,640 CALYBP (Beta-117541) from the lowest level; a second date on wood from the same level is nearly identical, at $14,480 \pm 300/16,916–17,767$ CALYBP (Beta-5701) (McDonald 2000:8, 37–46). The middle horizon at the Saltville site included a cluster of pebbles and cobbles from a small depression, the uppermost stratum of which yielded 12 pieces of microdebitage and some fish bones. Twigs collected from a sand lens from within the block yielded a radiocarbon date of $13,950 \pm 70/16,486–16,978$ CALYBP RCYBP (Beta-65209); two other dates from the same stratum were similar in age, $13,460 \pm 420/15,563–16,771$ CALYBP (SI-641) on tusk and $13,130 \pm 330/14,533–16,371$ CALYBP (A-2985) on wood (McDonald 2000:8, 33). The upper horizon, currently undated, was a feature in an eroded rill into the middle horizon that contained a midden-like concentration containing over 200 clam shells, over 500 pieces of small vertebrate teeth and bones, and 125 pieces of chert microdebitage, some of which appear to be intentionally produced flakes. McDonald (2000:34–36) suggests the debris was formed by people harvesting shellfish and small animals from the lake during periods of low water. If created by human action, the feature would be the oldest shell midden in the New World.

Other absolute dating procedures also warrant consideration. Dendrochronology may ultimately prove a useful procedure for precisely dating early sites, provided wood with enough growth rings can be found either to tie in to existing reconstructions or, as is more likely for the foreseeable future, to develop fairly precise dates through wiggle-matching radiocarbon-dating procedures (e.g., Stuiver et al. 1998; see also Christen and Litton 1995 and Goslar and Madry 1998). Developing dendrochronological reconstructions for the Pleistocene may prove extremely difficult, but having annual scale proxy climate data for this era would give us great insight into the world that early Southeastern peoples experienced. In the deep South, subfossil cypress logs dating back into the Pleistocene may be preserved in stream channels, sinkholes, or marsh deposits; these may prove a source of annual scale climate data, as well as provide a means of dating (Stahle et

al. 1985). Archaeomagnetic dating may also eventually prove useful, if sufficient samples can be found to develop a calibration curve (Eighmy and Sternberg, eds., 1990). Even if absolute dates cannot be immediately obtained using this procedure, it may provide information on the relative dates of closely spaced features.

Finally, increased effort should be paid to existing artifact collections from across the region to see if new diagnostic point and tool forms are present that can help identify components of the various Paleoindian subperiods. The early Triangulars found at Cactus Hill may be present in any number of surface collections from the region, for example, as may points comparable to the Miller Lanceolate type found at Meadowcroft (Adovasio et al. 1999:28). These points would likely be called middle- or late-Paleoindian lanceolates if found in surface context. The early Triangulars from Cactus Hill might even be considered preforms for early-Archaic notched points; now we believe them to be much older. Literally millions of projectile points are maintained in collections around the region, both in museums and other formal curatorial repositories and in the hands of amateur collectors (e.g., Charles 1981). These data, when properly examined, can yield important knowledge about the past and just may contain many more early-Paleoindian diagnostics. Over the past several decades, furthermore, measurement data from thousands of Paleoindian points have been collected from across the region and beyond. It is time to start seriously examining these data to understand the meaning of the variability present within them.

Using Calendar Dates When Reporting Time

If we are to understand what happened in the Southeast prior to 11,425 CALYBP/10,000 RCYBP, we must routinely employ calendar ages when discussing sites and assemblages and when modeling culture change. The development of an extended radiocarbon calibration encompassing upwards of 20,000 years in recent years (Stuiver et al. 1998) and the increased use of dating procedures like OSL or TL that yield calendar ages on Southeastern Paleoindian sites have enabled researchers to use calendar dates with confidence when discussing early occupations. Given the great difference between uncalibrated radiocarbon and calendar ages at this time level, at a minimum some 1,400 years, and the fact that plateaus, jumps, and even reversals are evident in the radiocarbon record, using calendar time is absolutely essential to understanding the regional archaeological record (Anderson 2001:143–44; Fiedel 1999, 2000). We now know, for example, that the incredible diversification of sites and point forms that occurred between ca. 10,500 and 10,000 RCYBP (12,568–11,425 CALYBP) did not occur within a mere 500 years, as we once thought, but over ca. 1,100 years, given the discovery of a major plateau in the radiocarbon calibration during this interval.

Accordingly, a new timeline encompassing the Paleoindian era in the region is advanced that incorporates calendar ages (Table 1). Three subperiods are proposed, the early, middle, and late

Paleoindian encompassing pre-Clovis, Clovis, and post-Clovis Paleoindian occupations (see also Anderson 2001:153–156, 2004). When the first people actually arrived in the Southeast is unknown, but it is assumed to have been prior to 13,500 CALYBP (i.e., >11,500 RCYBP), the earliest date currently accepted for the inception of the Clovis tradition. There appears to be little argument that pre-Clovis remains exist in the Americas at present, although appreciable discussion may focus on the dating of specific sites and assemblages. A number of early-Paleoindian sites are currently reported in the Southeast, including Cactus Hill, Topper, Little Salt Springs, and Salville. While the cultures represented by these assemblages remain somewhat enigmatic and are known by little more than their presence and the dating of some of these sites remains somewhat controversial, some or all appear to be genuinely pre-Clovis in age (Goodyear 2004). One of three explanations for these sites appears likely, that they (1) represent the remains of small groups that arrived in the region but died without issue, so-called “failed migrations”; (2) represent the remains of early continuous settlement by such few numbers of people that the archaeological record they produced is nearly invisible; or (3) indicate that a combination of the first two options may have occurred in different parts of the region. That is, people may have successfully settled in some areas and died out in others during this period. While not all these sites are universally accepted as early Paleoindian in age, most researchers accept that pre-Clovis occupations are increasingly probable.

The middle-Paleoindian subperiod encompasses the interval when Clovis and related fluted-point assemblages are assumed to have been common over the region, from roughly 13,500 to 12,825 CALYBP (i.e., ca. 11,500–10,800 RCYBP). While few sites have actually been dated to this interval in the Southeast, the large numbers of Clovis points that have been reported and the existence of a number of sites with dense assemblages, such as Carson-Conn-Short (Broster and Norton 1996:290–293; Broster et al. 1994, 1996; Nami et al. 1996) and Wells Creek Crater (Dragoo 1973) in Tennessee, Adams (Sanders 1988, 1990) in Kentucky or Williamson (McCary 1951, 1975) in Virginia, suggest a fairly substantial human presence, at least when compared with what came before. While Clovis assemblages in North America are for the most part dated somewhat later in time, to between ca. 13,172 and 12,982 CALYBP/ca. 11,200–10,900 RCYBP (Fiedel 1999, 2000; Taylor et al. 1996), a starting date of 13,500 CALYBP/11,500 RCYBP is advanced here, since two dates from the Aubrey site in Texas are in the ca. 11,500–11,600 RCYBP range/ca. 13,500–13,625 CALYBP (Ferring 1995), and since 11,500 RCYBP is a number that has been used for the onset of Clovis in the region for about a decade now in Southeastern timelines (e.g., Anderson 1990).

When Clovis is more precisely dated, the starting point for this subperiod may have to be adjusted either forward or backward in time. There are hints that the starting date may move backward, perhaps to around 14,000 CALYBP or ca. 12,000 RCYBP. A date of 11,900 ± 80 RCYBP/13,636–14,094 CALYBP (AA-27486) was obtained from a level containing a Clovis assemblage at the Big Eddy site in Missouri, although the other

Table 1. A Southeastern Paleoindian Chronology (calibrated dates obtained using the Calib 4.4 program, and averaging the one-sigma range; adapted from Stuiver et al. 1998).

	Approximate Calendar age (CALYBP)	Radlocarbon age (RCYBP)	Culture complex	Climatic event
Early Archaic	8892	8000	Bifurcate	
	10,197	9000		Boreal
	10,865	9500	Corner-notched widespread	
	11,243	9900	Side-notched widespread	
Late Paleoindian	11,425	10,000		
	11,586	10,100		Younger Dryas ends/Preboreal
	11,886	10,200	Early Side-notched	
	12,568	10,500	Dalton/Suwannee, Quad/Beaver Lake	
	12,826	10,800	Cumberland/Folsom	
Middle Paleoindian	12,982	10,900		Younger Dryas begins
	13,039	11,000		
	13,077	11,100		Inter-Allerød Cold Period ends
			Clovis widespread	
	13,172	11,200		
	13,316	11,400		Inter-Allerød Cold Period begins
Clovis beginnings??	13,497	11,500		
	13,675	11,750		Allerød
	13,456	11,950		Older Dryas ends
Early Paleoindian	14,044	12,000	Little Salt Springs/Page-Ladson	
	14,342	12,100		Older Dryas begins
	14,808	12,500	Monte Verde	
	14,897	12,600		Bolling begins
	19,091	16,000	Cactus Hill (?)	
	21,392	18,000	Initial Colonization (?)	Glacial maximum

dates from the same level fall into the more expected range of from ca. 11,400 to 10,700 RCYBP/13,316 to 12,770 CALYBP (Lopinot et al., eds., 1998:92–93, 218). Three dates from the Johnson site in central Tennessee—11,700 ± 980 RCYBP/14,039 CALYBP (TX-7000); 11,980 ± 110 RCYBP/13,996 CALYBP (TX-7454); and 12,660 ± 970 RCYBP/15,048 CALYBP (TX-6999) on hearths with associated fluted preforms (Broster and Barker 1992; Broster and Norton 1996:292–294; Broster et al. 1991; Goodyear 1999a:448–449)—when coupled with the date from Big Eddy suggest Clovis may originate earlier than traditionally thought in the Southeast.

The late-Paleoindian subperiod is dated from roughly 12,826 to 11,425 CALYBP or 10,800–10,000 RCYBP, a range that closely corresponds to the Younger Dryas climate interval, a pronounced return to cold and highly variable climatic conditions worldwide that lasted from roughly 12,900 until about 11,650 CALYBP/10,850–10,100 RCYBP. During the late-Paleoindian era, Clovis technology was replaced by local assemblages whose distribution was restricted to portions of the larger region. The emer-

gence of these subregional cultural traditions is thought to have been brought about by rising population levels and the extinction of megafauna, which would have reduced the need for long-distance movement and interaction to obtain subsistence and maintain a mating network. The onset of the Younger Dryas, which brought a dramatic change in global conditions, and the ensuing period of increased climatic variability are thought to have played a role in the changes observed over this interval.

A range of fluted and unfluted lanceolate forms occur early in the late-Paleoindian subperiod, followed by notched points toward the end of the era. Specific types that are thought to date early in the subperiod, from ca. 12,826 to 12,568 CALYBP/10,800–10,500 RCYBP, include Beaver Lake, Clovis Variant, Cumberland, Quad, Suwannee, and Simpson, as well as Plains forms in the western part of the region such as Folsom, Plainview, Midland, and later in time, Angostura. Around 12,500 CALYBP Dalton points become common over much of the region (Goodyear 1982), with distinct variants occurring in different areas, such as Colbert, Greenbrier, Hardaway, Nucholls, and San Patrice

vars. Hope and St. Johns. In Florida, Dalton points are comparatively rare; Suwannee points are thought to have continued in use, possibly as a local substitute, until they were replaced by side-notched points. In the western part of the region, Plains Paleoindian forms continue to occur. By ca. 11,886 CALYBP/10,200 RCYBP, side-notched point forms appear, as suggested by dates at both the Dust Cave and Page-Ladson sites; and by ca. 11,425 CALYBP/10,000 RCYBP, side-notched variants occur widely over the region. The onset of the Holocene climate interval, and the Archaic cultural period, is traditionally dated to 10,000 RCYBP/11,425 CALYBP, shortly after the end of the Younger Dryas.

To reiterate, in the future, calendar dates should always be used in discussing Paleoindian occupations in the Southeast. When radiocarbon dates are cited, calibrated calendar dates should typically be given as well. The ca. 1,425-year offset between calendar and radiocarbon time at the end of the Paleoindian period (i.e., 10,000 RCYBP/11,425 CALYBP) increases to over 2,000 years at 12,000 RCYBP/14,044 CALYBP and to almost 3,500 years at 18,000 RCYBP/21,392 CALYBP (Table 1). When coupled with the existence of extended plateaus, such as that from 10,500 to 10,100 RCYBP/ca. 12,568–11,586 CALYBP, using radiocarbon dates alone to discuss events during the Paleoindian era gives a highly erroneous picture.

Emphasizing Multidisciplinary Research Programs

Some of the finest Paleoindian research projects currently underway in the Southeast are taking place at sites like Cactus Hill, Coats-Hines, Dust Cave, Page-Ladson, and Topper, where many different specialists are working together to understand and interpret the assemblages. Geology, geoarchaeology, botany, ethnobotany, palynology, paleontology, and zooarchaeology are all disciplines routinely brought to bear on Paleoindian sites in the region. Not only are collaborative research and the mixing of different research perspectives exciting, they invariably lead to new insights.

Lithic raw-material sourcing studies involving archaeologists and geologists are particularly important, since the information can be used to evaluate directly where raw materials originated and to learn indirectly how early peoples themselves moved over the landscape. Appreciable research has been directed to delimiting lithic raw-material sources in the Southeast using data on trace elements, petrography, or fossil microfauna (e.g., Anderson et al. 1982; Banks 1990; Daniel and Butler 1991; Goodyear and Charles 1984; Upchurch 1984). Since many lithic raw materials in the Southeast are difficult or impossible to distinguish macroscopically, such studies are extremely important. In Georgia, for example, there are cherts in the Piedmont that are identical in appearance to cherts from the Coastal Plain over 100 km away (Ledbetter et al. 1981). The Piedmont cherts lack the microfossil inclusions ubiquitous in cherts from the Coastal Plain, however, and a microscope is needed to differentiate the materials.

Even information on variations in material quality within an outcrop can be important. A multiyear research program at the

Allendale chert quarries in South Carolina, for example, has shown that assemblage composition can vary markedly, detectable by fairly subtle variations in topography and local raw-material quality (Goodyear 1992, 1999a, 1999b, 2000, 2004; Goodyear and Charles 1984; Goodyear et al. 1985). Paleoindian populations apparently focused on chert boulders freshly exposed in stream beds rather than on more weathered materials on nearby hillsides. Differences of no more than a few meters' vertical elevation and a few tens of meters' horizontal distances separate Paleoindian period quarrying, workshop, and possible habitation areas within the locality.

Collaborative research also means open research. Visits by other professional archaeologists are routinely encouraged in the Southeast, a by-product of the "tradition of hospitality" and courtesy researchers in the region have routinely extended to one another as far back as the New Deal era (Brown 1994). Over 100 different professional archaeologists, for example, have visited Al Goodyear's investigations at the Topper site in recent years, including many of the top Paleoindian researchers in the country. (I know this for a fact, since I throw a barbecue for the project visitors and crew each year at my home—which is located just 30 miles from Al's site—at the end of the field season, and have kept a guest book.) Specialists with widely varying positions on the existence of pre-Clovis deposits in the Americas have been present. Besides assisting with the digging and examining the artifacts and profiles, they commonly engage in freewheeling discussions round the clock. This is exactly the way science should proceed, through the collegial exchange of ideas. Similar activities characterize the ongoing Dust Cave and Cactus Hill projects, which have become something of in-the-field meeting places.

Encouraging Model Building

While primary data collecting is critical, interpreting the information that comes in is just as important. Indeed, our theoretical perspective often shapes the kind of data we collect. As Albert Goodyear has often noted, until the late 1990s and his work at Topper, he typically never dug below the Clovis levels at the sites he was examining because he "knew" there were no earlier peoples in the Americas; as he put it, "You don't look for what you don't believe in" (Marshall 2001:1730). He was not alone in this perspective. Twenty years ago I opened three 1-by-1-m units 80 cm below the Paleoindian and early-Archaic levels at the Rucker's Bottom site in Georgia, but I did so "to document the absence of artifacts below the level of the remainder of the block" (Anderson and Schuldenrein, eds., 1985:289). A few small flakes were found that were attributed to intrusion from above; but in light of what we know now, I can only wonder if they really were intrusive, or perhaps were evidence of an earlier occupation. Although we mentioned their presence, since we were unable to persuade the funding agency to provide funds to explore the site's well-documented Paleoindian and early-Archaic remains further, much less the many later-period components (we dug almost twice the area contracted for anyway, using volunteers), I know what the reaction would have been to a request to look for possible pre-Clovis remains on the basis of a few flakes. I would like

to think that such a request today, in light of recent findings, would receive more serious consideration.

The point, of course, is that we are always trying to explain the archaeological record; and we do so in terms of what makes sense or seems reasonable, given the data at hand and expectations from our knowledge of anthropological and archaeological theory. Accordingly, greater attention should be directed to well-grounded, theoretically informed analyses and model-building activity. For example, while a number of probable pre-Clovis sites have been found in the Southeast and across the Americas, archaeologists are struggling to interpret what these remains mean. If people really were present 15,000 or 20,000 years ago, why is the archaeological record prior to the middle-Paleoindian Clovis subperiod beginning some 13,450 years ago so spotty and varied? Why didn't earlier peoples in the Americas quickly reproduce themselves into greater visibility, as hunter-gatherer demographic theory suggests they should (e.g., Hassan 1981:137–42, 201–203)? Several answers come to mind, including that these earlier remains represent "failed migrations" or groups that died out; that the pre-Clovis archaeological record is actually right in front of us, but we haven't recognized it as such (i.e., points resembling early Triangulars and Miller Lanceolates are not all that atypical to anyone who has handled tens of thousands of Southeastern projectile points); or that early populations were present in some areas and settings but not in others, such as in (now submerged) coastal areas, or on riverine terrace margins long since scoured away (e.g., Butzer 1991; Faught 1996, 2004; Goodyear 1999a).

Likewise, since we know that hunter-gatherer technological organization and mobility strategies are shaped by resource structure, physiography, and effective temperature (e.g., Binford 1980; Kelly 1983, 1995), it is reasonable to expect that Paleoindian adaptations over a region as large and diverse as the Southeast varied appreciably over both time and space. Meltzer (1984, 1988) has explored this idea on a larger scale in examining Paleoindian assemblages in the northern and southern parts of eastern North America. Northern populations were inferred to be economic specialists, exploiting primarily caribou, and leaving behind dense kill and occupation sites. A more generalized foraging adaptation was proposed for the South, with occupations in most areas of fairly short duration. In a similar modeling analysis, Cable and Claggett (Cable 1982, 1996; Claggett and Cable, eds., 1982) argued that the dramatic changes in global temperature at the end of the Pleistocene would have produced differing adaptations over time as temperatures warmed, and over space from lower to higher latitudes. They evaluated the model with data from the deeply stratified Haw River sites in North Carolina and demonstrated that a fairly dramatic shift from curated to expedient tools apparently occurred by the initial part of the early Archaic, around 11,425 CALYBP/10,000 RCYBP (Cable 1982:686–687; see Short 1996 for a discussion of curated versus expedient technology and how these concepts can be used in interpreting Paleoindian assemblages). This technological shift was thought to reflect the replacement of logistically organized "collector" adaptations (after Binford 1980) by residentially mobile foraging adaptations.

Thus, given differences in climate and biota, contemporaneous Paleoindian occupations in Florida likely differed from those in Kentucky or Virginia, or in the Great Lakes and the Northeast. Likewise, Paleoindian occupations and settlement systems in the same locality likely differed over time, as climate and biota changed. To date there has been little exploration of these possibilities, aside from Meltzer's (1984, 1988) broad regional comparative analyses and other more focused intersite comparisons (e.g., Sanders 1990:65–69; Tankersley 1998). Instead, Paleoindian settlement and mobility strategies tend to be subsumed under somewhat monolithic models that emphasize generalized foraging (Meltzer and Smith 1986) or more focused large-animal procurement (e.g., Kelly and Todd 1988). Indeed, the high-technology forager (HTF) model proposed by Kelly and Todd (1988) explains how highly mobile populations could exploit a wide range of environments with a standardized technology and organizational strategy. The HTF model, in fact, helps to explain why Clovis assemblages appear so similar over large areas. But are they really? Can we really say that the sites and assemblages found in the Tennessee River valley are identical in composition to those in Florida or South Carolina? More comparative analyses of site and assemblage data are clearly needed, and more subregional or locality specific settlement models need to be proposed.

Likewise, Paleoindian ceremonialism needs greater consideration. The existence of a formal Dalton cemetery has been pretty conclusively documented at the Sloan site in northeast Arkansas, where some 200 tiny, weathered human bone fragments were found amid a remarkable assemblage of Dalton points and other tools that were apparently interred with the dead (Morse 1975; Morse, ed., 1997). Sloan is located well away from contemporaneous Dalton sites, on a sand dune that saw only minor use in later prehistory. The reason we know so little about Southeastern Paleoindian ceremonialism, Sloan demonstrates, is because we may be looking in the wrong places. Given this, claims that Paleoindian caching behavior—like that which produced sites like Richey-Roberts/East Wenatchee (Gramly 1993) and Anzick (Lahren and Bonnicksen 1974)—is absent in the East would appear premature. These types of assemblages may be located in relatively isolated parts of the landscape; or, as the human remains found at Little Salt Springs and the later-Archaic Windover site suggest, submerged in bogs or marshes (Clausen et al. 1979; Doran et al. 1988).

Ceremonialism and interaction were clearly linked in the later-Paleoindian Southeast. Over 1,000 late-Paleoindian Dalton sites have been reported in the central Mississippi River valley, from northeast Arkansas to south-central Illinois, in an area that was almost certainly fabulously rich in natural resources and was likely settled quite early. The scattered occurrence of large, exquisitely chipped Sloan points over this area, in caches and as isolated finds, many of them made on Burlington chert from the Crescent Quarries near the Missouri-Mississippi confluence, has been used to infer the existence and extent of a possible late-Paleoindian prehistoric ceremonial and alliance network aptly called the "Cult of the Long Blade" (Walthall

and Koldehoff 1998). The existence of adzes in Dalton toolkits has long been thought to reflect appreciable woodworking skills, including the manufacture of dugout canoes (Morse and Goodyear 1973); watercraft are inferred to have been a primary way these groups were linked together (Walthall and Koldehoff 1998:261; see also Engelbrecht and Seyfort 1994 and Jodry 1999 for discussions of evidence of the probable use of watercraft by Paleoindian populations). Whether and how ceremonialism linked Paleoindian groups across the region is a subject that has seen little examination. Many Paleoindian sites occur in dramatic settings on the landscape, suggesting locations had a sacred aspect while also serving as meeting places between different groups.

Exemplary craftsmanship was a major and widely shared aspect of middle- and late-Paleoindian culture, even in producing stone tools used for routine tasks. Was this Paleoindian fascination with high-quality lithic raw materials solely due to the need to maintain a highly curated toolkit by mobile populations, as Goodyear (1979, 1989) has argued? Or was it also shaped by the ceremonial role of artifacts made from these materials, as exemplified by the presence of elaborate specimens in caches and burials (e.g., Walthall and Koldehoff 1998)? In my opinion the effort and care that went into the production of the Paleoindian toolkit, which includes some of the finest chipped-stone artifacts ever produced in the New World, had to go beyond functional considerations. Visiting quarry areas accordingly may have been as much about promoting ceremony and interaction as about replenishing high-quality stone if groups knew they could find others at these locations at certain times of the year (Daniel 1998:194–95; 2001). By procuring high-quality stone and fashioning it into exquisite tools, these early peoples were likely reinforcing basic cultural values and, not unexpectedly, increasing their chances of surviving. The fact that aspects of the Paleoindian toolkit were retained for thousands of years after the demise of the conditions that supposedly caused them to come about in the first place further suggests this was a highly important, and conservative, aspect of these people's culture. Paleoindian use of stone, in my opinion, at least at some times and in some areas had as much to do with ideology as it did with technological and functional considerations.

Existing Paleoindian settlement models advanced for the region should be evaluated and refined wherever possible. These include, to list a few, Morse (1977) and Gillam's (1996, 1999) thoughts on Dalton settlement patterns in northeast Arkansas, and how they are influenced by drainage features and lithic outcrops as well as by potential for interaction; Walthall's (1998) ideas on why rockshelters were not occupied until the late-Paleoindian era; Morrow's (1996) ideas on Paleoindian technological organization and mobility; Daniel (1998) and Gardner's (1983, 1989) views on the importance of quarry/raw material source areas in shaping settlement systems; Dunbar's (1991) ideas on how physiography, drainage conditions, and the occurrence of knappable stone shaped Paleoindian occupations in Florida; Hubbert's (1989) views on Paleoindian

site variability in the central Tennessee River Valley; various perspectives on the subsistence orientation of these early populations (e.g., Meltzer 1988; Meltzer and Smith 1986; Walker 2000); ideas on possible movement directions or corridors by colonizing populations, based on geographic and demographic modeling or raw material distributions (Anderson and Gillam 2000, 2001; Moore and Moseley 2001; Steele et al. 1988; Tankersley 1991, 1994); ideas Paleoindian mortuary behavior, ceremonialism, and interaction (Anderson 1995; Morse, ed., 1997; Walthall and Koldehoff 1998); or my own ideas on Paleoindian staging areas or possible loci of original settlement from which expansion over larger areas could be launched (Anderson 1990, 1996; see Dincauze 1993b and Cable 1996:144–145 for examples of extensions and challenges to this model). Fortunately, in the Southeast we do not appear to be suffering from any dearth of ability to think about and interpret Paleoindian data, although much more could obviously be done.

Emphasizing the Importance of Thorough Publishing of Research

The publication of research conducted at Paleoindian sites and with Paleoindian assemblages in the Southeast needs to be encouraged. Full publication includes the thorough description of what was done, what was found (by provenience), and what measurements were taken or results were obtained during associated analyses. It also includes the reporting of all samples collected and processed in specialized analyses, including absolute dating, as well as the inclusion of sufficient photographs, floor plans, and profiles so that researchers can understand the assemblage context. Finally, when interpretive claims are made, these should be backed up with analyses that can be replicated using the collected data.

Comparatively few Southeastern Paleoindian sites can be considered adequately reported by these standards, but those that have been serve as excellent role models. The only work at an early-Paleoindian site that has been thoroughly reported to date is at Cactus Hill through the 1996 field season in an outstanding monograph summarizing the work of two separate teams of researchers (Johnson 1997; McAvoy and McAvoy 1997). Excellent descriptive summaries are also available for the work at Saltville (McDonald 2000) and Little Salt Spring (Clausen et al. 1979). At Topper only limited reporting has occurred, which is fully justifiable since work in the pre-Clovis levels was initiated in 1998 and is ongoing (Goodyear 1999b, 2000, 2004).

Examples of thoroughly published middle-Paleoindian Clovis sites are rare, at least among those yielding extensive assemblages; Adams in Kentucky (Sanders 1988, 1990) and Williamson in Virginia (McCary 1975) are perhaps the best known. Examples of late-Paleoindian sites meeting most or all the reporting standards suggested above (and with fairly extensive assemblages) include Stanfield-Worley Bluff Shelter in Alabama (DeJarnette et al. 1962), Brand and Sloan in northeast Arkansas (Goodyear 1974; Morse 1975; Morse, ed., 1997), Harney Flats in Florida (Daniel and Wisenbaker 1987); early work at Hester in Missis-

ssippi (Brookes 1979), Big Eddy in Missouri (Lopinot et al., eds., 1998, 2001), and the Haw River and Hardaway sites in North Carolina (Claggett and Cable, eds., 1982; Daniel 1998).

Many more Paleoindian sites are, of course, known from the Southeast. Some have been the subject of exceptional summary papers or preliminary reports, such as Dust Cave in Alabama (Driskell 1994, 1996; Goldman-Finn and Driskell 1994); Page-Ladson (Dunbar et al. 1988), and Wakulla Springs Lodge in Florida (Jones and Tesar 2000); John Pearce in Louisiana (Webb et al. 1971); Taylor in South Carolina (Michie 1996); the Pierce (Broster 1982), Twelkemeier (Broster and Norton 1990), and Wells Creek Crater (Dragoo 1973) sites in Tennessee; or the Flint Run site complex in Virginia (Gardner, ed., 1974), to cite a few of the many possible examples. In the case of smaller site assemblages encompassing limited surface or excavation data, such papers accomplish the goal of full publication. Such reporting efforts deserve our commendation, since they ensure that site data get out well ahead of final reports.

Survey projects, and not just excavation activity, also warrant thorough publication. An exceptional report on a site survey focusing on Paleoindian assemblages is that by McAvoy (1992), encompassing portions of southern Virginia in the vicinity of the Nottoway River and its tributaries. Using extensive and well-controlled surface and excavation data from over 100 sites, including the well-known Williamson site, the author advanced a series of detailed observations about culture change over time, differing site types, the activities that likely occurred on these sites, patterns of settlement movement within the study locality, and possible group territories/ranges in the larger region of southern Virginia and northern North Carolina. The importance of this study lies in its extensive presentation of primary data, its use of well-documented avocational collections for serious research, and in highlighting the variability in local Paleoindian site assemblages. A second well-documented survey effort is that by Goodyear and Charles (1984) of sites of all periods in the Allendale chert quarry area in South Carolina. Finally, the primary data Michael K. Faught and I have used to generate fluted-point distribution maps has been available on request for over a decade; these data have been posted on the Web for the past several years (Anderson 1990; Anderson and Faught 1998, 2000; Faught et al. 1994).

For larger sites or survey projects, especially those in which extensive data collection over large areas or many seasons occurred, however, short papers or preliminary reports are no substitute for monograph-length treatments or extended papers presenting the full range of data described above. Unfortunately, final reports on large-scale Paleoindian archaeological research projects remain comparatively rare in the Southeast. No final reports exist for many classic sites, and in some cases the original researchers have passed on. Fortunately, if the collections and original records are well maintained, upcoming generations of researchers will be able to salvage some information from this work; graduate students in particular can write theses and dissertations with these materials. We all must take great care when collecting primary data to ensure that as much information as possible is recorded about what we did and found so that some-

one down the line will be able to write up what was done, even if we are unable to do so ourselves.

Archaeologists should be encouraged to publish detailed site reports and be rewarded when they do so (conversely, when they fail to publish perhaps they should be discouraged from conducting new fieldwork or should be encouraged to team up with people who can write). Within academia, in my opinion, those capable of producing sound descriptive and theoretically informed interpretive site reports or research syntheses should receive the highest priority for promotion and tenure, while those producing trendy theoretical papers with brief intellectual half lives should receive far less consideration. Unfortunately, today's academic world encourages the latter kind of publication and promotes fragmenting research results into a myriad of publication outlets, since what appears to be typically rewarded is a high number of publications and only rarely a solid book or monograph of long-term intellectual quality. This must change if we are to advance as a profession.

Authors of good site reports should thus be cherished as exemplars of responsible archaeological behavior, for they are producing records that will last far beyond their lifetime and will be referred to for generations to come. When we dig, write, and curate our collections and records properly, and do not merely dig and through inaction destroy, we are upholding the highest ethics of our profession, meeting our responsibility to the archaeological record and hence to the people of the past whose lives our work has touched and brought back to life.

Conclusions

The Southeastern Paleoindian archaeological record is among the richest in the New World in terms of numbers of sites and artifacts. The community of scholars working with these assemblages, dedicated professional and avocational archaeologists alike, are generating a wealth of important information. Most of us feel somewhat overwhelmed with what needs to be done, however; and if there is a logical conclusion to a paper pointing out new research directions, it is that more people, avocational and professional archaeologists alike, need to get involved in Paleoindian/late-Pleistocene archaeology in the region.

At present, only rarely do more than one or two people in any given Southeastern state focus on Pleistocene archaeological remains, and even they are typically involved in a host of other duties or research areas. Much of the Paleoindian-period archaeological reporting in Mississippi in recent years, for example, has been accomplished by state archaeologist Sam McGahey (1981, 1987, 1993, 1996) and U.S. Forest Service archaeologist Sam Brookes (1979). To the best of my knowledge, not a single person in the region is able to work full time on the subject. In fact, the vast majority of the primary data and literature produced in the region over the past quarter century reflects the work of about 40 or 50 people. The miracle is that we know as much as we do. The field is thus wide open, and I think I speak for all those working in the Southeast in saying we would welcome with open arms anyone interested in working on Paleoindian archaeology in the region.

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