

# Chapter 12

## Clovis across the Continent

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### ABSTRACT

Clovis is the most geographically expansive archaeological culture in North America. Its spatial and temporal extent is truly remarkable and consequently raises a number of questions. In this paper, we focus on Clovis typology and chronology, especially how it relates to definitions of “Clovis as artifact type” versus “Clovis as colonizing behavior.” We derive our definition of “Classic Clovis” from sites located on the Great Plains (e.g., the Clovis type site along Blackwater Draw, New Mexico; Miami, Texas; Dent, Colorado), and the group of mammoth kills in the southwestern U.S. (e.g., Naco, Lehner, Murray Springs). These sites, and a handful of other dated sites with Clovis technology, fall within ~13.4k–12.7k cal yr BP (11,600–10,800 <sup>14</sup>C yr BP). We conclude by describing the range of variation in the context of the sites that are most frequently used to define Clovis technology in North America. These include fluted points associated with remains of extinct fauna, Clovis points associated with radiocarbon-dated deposits, buried deposits with distinctive Clovis technology, surface sites with Clovis technology, dated sites without Classic Clovis artifacts, and surface sites with Clovis technology.

**KEYWORDS:** Typology, Chronology, Geoarchaeological Context, Classic Clovis, Western Stemmed, Western Fluted, Northeastern Fluted

### Introduction

Clovis is the oldest archaeologically visible, well-defined, and relatively homogeneous archaeological culture in North America. It is also the most geographically extensive occupation of any time in the archaeological record of the Americas and it is often defined as being present in every state in the lower 48. While this assertion is not well supported, as discussed below, Clovis or Clovis-like artifacts have been reported coast to coast and from the Canadian border into northern Mexico (Collins 1999:35; Haynes 1964; Haynes 2002:xi–1; Meltzer 2009:241; Anderson et al. 2010; Bradley et al. 2010:1–177).

Further, radiocarbon dating, also discussed below, shows that most of unglaciated North America was occupied by ~13,000 cal yr BP.

The geographic extent of Clovis is truly remarkable, and consequently raises a number of questions. How are Clovis occupations identified on a coast-to-coast basis? Most commonly this has been accomplished by looking at Clovis lithic technology with a heavy emphasis on projectile points. But how do the artifact styles vary across the continent? Do all artifacts considered to be Clovis or related to Clovis have the same age range? The answer requires solid numerical age control across the continent. Further, there is evidence for Clovis-age assemblages that do not look like Clovis (e.g., Western Stemmed) (e.g., Beck and Jones 2010; Jenkins et al. 2012). What is their relationship to Clovis?

This paper is an attempt to address issues of Clovis chronology, technology, and typology. These questions combine to focus on the question of “what is Clovis?” That question and, perhaps more importantly, “what is not Clovis?” has

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been an issue almost since “Clovis” was recognized as a typologically distinct entity. Continuing fieldwork and technological analyses are shedding light on these questions, and we provide a brief analysis. Clovis chronology is also an evolving question, to a certain degree linked to the issue of “what is Clovis?” but a more objective issue to resolve. Different approaches to the issue and different interpretations, however, have resulted in a debate over a “short chronology” versus a “long chronology,” which we outline and to which we contribute our own views.

### What Is Clovis?

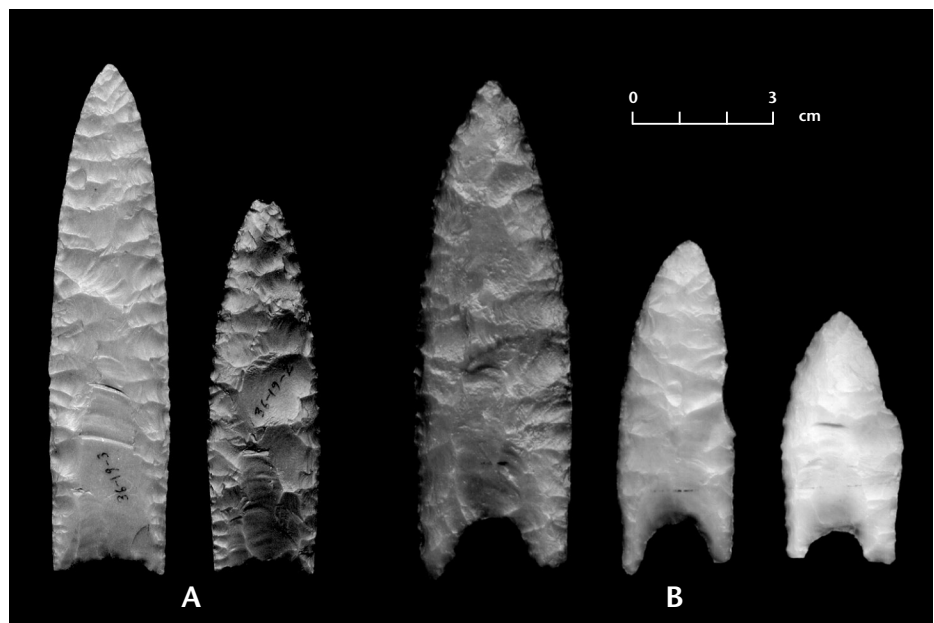
Finds of Clovis points at the Clovis type site (Blackwater Draw Locality 1; Figure 12.1A) and a handful of other sites, resulted in recognition of a “Clovis type” that is based for the most part on large, parallel-sided lanceolate bifaces with slightly concave bases, and single or multiple flutes that rarely extend more than a third of the body (Figure 12.1A) (Howard 1990; Justice 1995:17–21; Sellards 1952). Overshot flaking is also common as a reduction technique in order to produce relatively thin finished pieces. Bifaces meeting these criteria have been reported in almost every state in North America (Anderson et al. 2010). Secondary hallmarks of Clovis lithic technology include the presence of biface caches (Kilby 2008) and prismatic blades (Collins 1999). Moreover, Bradley et al. (2010) provide a highly detailed and exhaustive discussion of even more distinctive characteristics of Clovis lithic and bone technology.

In addition to their typological consistency and spatial breadth, there are least 14 sites with solid associations of remains from extinct proboscidean and artifacts, including Clovis points (Grayson and Meltzer 2002, 2003; Surovell and Waguespack 2008). This has provided the foundation for various colonization models of the peopling of the North America that include a sudden appearance of Clovis via rapid ex-

pansion out of the Ice Free-Corridor with extraordinarily high rates of residential mobility fueled by the predation of large mammalian species that subsequently became extinct (e.g., Haynes 1969, 2006; Kelly and Todd 1988; Mosimann and Martin 1975). Thus, “Clovis as artifact type” was neatly packaged with “Clovis as colonizing behavior.”

However, this view is problematic for several reasons. There are multiple widely accepted pre-Clovis sites, most notably Monte Verde in Chile (Dillehay 1997), Hebior in Wisconsin (Overstreet 2006; Overstreet and Kolb 2003); the Debra L. Friedken site in Texas (Waters et al. 2011b), and Paisley Cave in Oregon (Gilbert et al. 2008; Jenkins et al. 2012). While these sites are not without their critiques (Fiedel 1999, 2013; Morrow et al. 2012; Poinar et al. 2009), they nonetheless leave open the possibility that even if Clovis does represent some kind of colonizing population, they may not have been the first. Moreover, since the temporal range of Clovis spans at the very least several centuries, it therefore encompassed multiple generations within this timespan. Consequently, it is likely that the majority of the Clovis archaeological record reflects the descendants of the first colonists, and not the first wave of individuals, if they were in fact a colonizing population.

The geographic origins and extent of Clovis are very unclear. So far, the oldest Clovis sites and the best candidates for Clovis precursors are at the Aubrey and Gault/Friedkin sites on the Southern Plains in Texas (Ferring 2001, 2012; Waters et al. 2011b) and possibly the Johnson site in central Tennessee (Barker and Broster 1996), essentially at the opposite end of the continent from Beringia and the Ice-Free Corridor where Clovis was stereotypically seen as starting (Hamilton and Buchanan 2007). The age range for Clovis also remains debatable. As discussed below, the dating issue revolves around a long chronology versus a short chronology. The answer has important implications for colonization. A shorter, more compressed chronology suggests either a very



**Figure 12.1** A, two of the “type” Clovis points from the Clovis type site (Blackwater Draw #1); B, NF points from the Debert site. All images are from the C. Vance Haynes Cast Collection at the University of Arizona (by Randy Haas).

rapid expansion across the continent or extremely high birth rates (Surovell 2000; Anderson and Gillam 2000; Hamilton and Buchanan 2007; Mosimann and Martin 1975; Barton et al. 2004; Steele et al. 1998).

Further, the original, broadly defined Clovis “style” or type may or may not have some regional variants. The term “Gainey” has been used to refer to the earliest fluted points in the lower Great Lakes region. The basis for distinguishing Gainey from Clovis is poorly articulated, however. Morrow (in press) sees subtle differences in the flaking technology between Clovis and Gainey. Eren and Desjardine (in press), in contrast, argue that

- 1) the broader assemblage (Clovis-like fluted points, large prismatic blades, and overshot flaking) is clearly indicative of Clovis, and
- 2) the term “Gainey” should be dropped.

Artifacts similar in style to Clovis are not necessarily the same age everywhere across the continent, nor do they necessarily represent the earliest recognizable archaeological presence in some regions.

In eastern and western North America, fluted points similar to Clovis appear to overlap Clovis in time (discussed below) and to have subtle but clear and consistent differences in morphology and technology. In the northeastern United States and far southeastern Canada, Clovis-like bifaces vary slightly in their morphology in that they have significantly deeper basal concavities (Figures 12.1B, 12.2) and overshot flaking is less prevalent (Speiss 1998; Ellis and Deller 1988; Miller and Gingerich 2013; Morrow and Morrow 1999). Similar to Clovis, these points are frequently recovered great distances from their raw-material sources (Goodyear 1989; Meltzer 1988). However, the people who manufactured these points appeared to focus on caribou and did not produce Clovis-style prismatic blades (Bradley et al. 2010; Ellis et al. 2011), although the differences between Clovis and other groups that made fluted points are often difficult to differentiate (Eren and Desjardine, in press). These Northeastern early fluted points (NF) appear to represent a late colonization of the recently deglaciated landscape.

Fluted points are relatively common across the Great Basin (“Western Fluted” or WF; “Great Basin Fluted” of Grayson 2011:289–92). These artifacts superficially resemble Clovis, but strong arguments have been made that technologically and morphologically these artifacts are distinct from the classic Clovis bifaces of the Great Plains and southwestern United States (Grayson 2011; Beck and Jones 2007, 2010, 2012b). Compared with Clovis, WF styles are shorter, thinner, and, like NF, have deeper basal concavities relative to their basal widths. There is considerable overlap between these variables, but this should be expected if one style derived from another. At least one well-documented Clovis site is present in the region: Dietz, in the northwest Great Basin (Jenkins 2007:78; Pinson 2008, 2011). Some relation between WF and Clovis is likely, given overlap in morphological metrics (Pinson 2011; Beck and Jones 2010, 2012b), and the pres-

ence of Clovis around the Great Basin, to the southeast in Arizona and Sonora (Holliday in press; Haynes and Huckell 2007; Sanchez and Carpenter 2012), and to the north at the Richey Roberts (Gramly 1993; Mehringer and Foit 1990), Simon (Butler 1963; Kohntopp 2010), and Anzick (Morrow and Fiedel 2006) sites, and northeast at Colby (Frison and Todd 1986). In the Great Basin, “Western Stemmed” points appear to overlap the temporal span for Clovis (Beck and Jones 2010; Jenkins et al. 2012) (discussed below) although the dating is debated (Beck and Jones 2012a; Fiedel and Morrow 2012). The WF style may represent technological and typological “drift” from Classic Clovis. Further, Clovis, as a precursor to WF, may well represent a colonizing population, but other groups using a different approach to projectile-point design (e.g., Western Stemmed) may have been colonizing other areas of North America at roughly the same time.

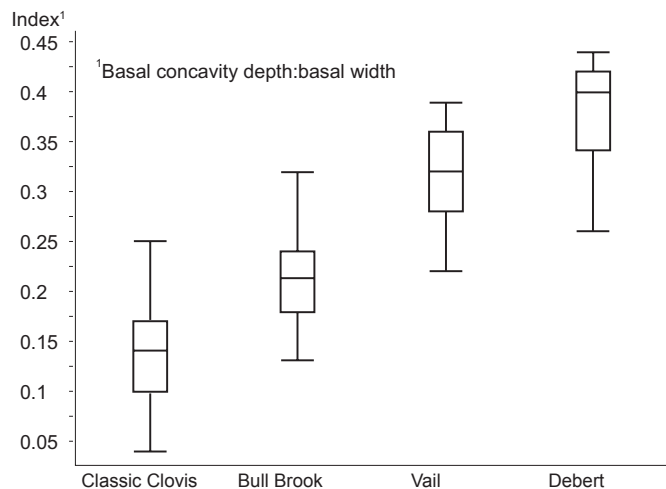
At this time, it is hard to defend Clovis as reflected by the archaeological record as a neatly bundled artifact type and behavior. Not all people wielding Clovis points may have been “acting Clovis” in the sense of rapidly expanding colonists in an unpopulated landscape. Conversely, people may have been “acting Clovis” without the Clovis points, an example of which may be the groups producing Western Stemmed points in the Great Basin or later groups producing Clovis-like fluted points in the northeastern United States and eastern Canada, and in the Great Basin. We view “Clovis” as an artifact type in a strict sense. “Classic Clovis” refers to the artifacts and sites with artifacts that conform in morphology and technology found at the classic sites located on the Great Plains sites (e.g., the Clovis type site along Blackwater Draw, New Mexico; Miami, Texas; Dent, Colorado) (Table 12.2, Figure 12.1A), and the group of mammoth kills in the southwestern U.S. (e.g., Naco, Lehner, Murray Springs) (Table 12.2) (following Bradley et al. 2010).

### Numerical Age Control for Clovis

Numerical dating of Clovis archaeology has been a concern to archaeologists and geoarchaeologists since the early days of the radiocarbon method in the 1950s, which coincided with the confirmation by Sellards (1952) that the Clovis component at the Clovis type site (Blackwater Draw Locality 1) was older than the Folsom component (Holliday 1997, 2000). The first reliable radiocarbon ages for Clovis artifacts were published in 1964 and came from three sites: Dent, Colorado, and the Clovis type site, New Mexico, both on the Great Plains; and Lehner, in the San Pedro Valley of southern Arizona (see Holliday 2000, and references therein for further historical context and dating specifics). Through the 1960s and 1970s, the dating for Clovis on the Great Plains, based on just a few sites (Clovis, Dent, Domebo, and Colby), suggested an age range of 11,500–11,000  $^{14}\text{C}$  yr BP (Haynes 1970, 1971, 1980).

Continued systematic attempts to refine the Clovis chronology by C. V. Haynes tightened and slightly shifted the age range to 11,200–10,900  $^{14}\text{C}$  yr BP (Haynes 1992, 1993). However, radiocarbon ages from the Aubrey site suggest that Clovis on the Southern Plains is as old as 11,600  $^{14}\text{C}$  yr BP (Ferring 2001, 2012). Plotting radiocarbon ages by region further sug-

gests some regional variation in the age of Clovis occupations: 11,600–11,000  $^{14}\text{C}$  yr BP on the southern Great Plains and 11,200–10,900  $^{14}\text{C}$  Yr BP on the northern Great Plains (Holliday 2000). Dates on Clovis from the Southwest (the San Pedro Valley sites in Arizona) and from the Northwest (Anzick in Montana) tend toward the younger end of the Clovis age range (Figure 12.4), providing support for the hypothesis, noted above, that Clovis entered the Great Basin and Far West via the Southwest and the northern tier of northwest states.



**Figure 12.2** Comparison of basal concavity indices showing that Classic Clovis points have relatively shallow basal concavity depth compared with Bull Brook, Vail, and Debert NF points. The index for Classic Clovis points was calculated from points from Blackwater Draw, Leikem, Escapule, Naco, Lehner, Murray Springs, Domebo, and Dent.

Waters and Stafford (2007) proposed a further tightened age range for Clovis, arguing that it was no more than 11,050 to 10,800  $^{14}\text{C}$  yr BP, based strictly on AMS dating of culturally specific organic matter (bone, ivory, seeds), which led to their rejecting the Aubrey dates. As argued by G. Haynes et al. (2007), however,

- 1) the age range is based on sites that happen to yield a particular suite of suitable materials, and
- 2) AMS dates on other materials and many conventional dates, such as the older dates from Aubrey, are still valid.

Ferring (2012) makes a strong case for the direct association of his radiocarbon samples with the Clovis occupation at Aubrey. The dating there is particularly significant because it is the oldest secure Clovis radiocarbon age on the continent (contra Waters and Stafford 2007). Ferring (2012) further argues that the Clovis assemblage at Aubrey might better be characterized as “proto-Clovis,” representing the final stages of an in situ (i.e., native North American) development of what would become “classic Clovis” lithic technology. This issue is also raised for the Friedkin site (Waters et al. 2011b), where a long predecessor to Clovis appears to be stratigraphically below Clovis. The issue is muddled, however, by the very large standard deviations (at or near 1000 years) for all the Paleoindian dates (Figure 12.4), which were determined

by OSL. Using the radiocarbon data from Waters and Stafford (2007) plus the dating at Aubrey, we use  $\sim 13.4\text{k}$ – $12.7\text{k}$  cal yr BP (11,600–10,800  $^{14}\text{C}$  yr BP) as the age range of Clovis. However, we readily admit that the corpus of dates available to address this issue is likely too small to produce a range with any statistical significance (Prasciunas 2008:69–106) and is subject to a wide variety of biases (e.g., Williams 2012; Ballenger and Mabry 2011; Surovell et al. 2009).

The more limited radiocarbon record for NF, WF, and Western Stemmed provides some clues to the origin and evolution of those types relative to Clovis. The NF style overlapped with late Classic Clovis and lasted until  $\sim 11.9\text{k}$  cal yr BP ( $\sim 10,200$   $^{14}\text{C}$  yr BP) (Figures 12.2, 12.3) (Miller and Gingerich 2013a,b). As noted above, Beck and Jones (2007, 2009) argue that WF evolved from and is thus younger than Classic Clovis. The only date bearing on WF is from the Sunshine Locality, indicating an age of  $> 10,320$   $^{14}\text{C}$  yr BP (Beck and Jones 2009). The radiocarbon record for Western Stemmed is clearer (Figure 12.5). Four sites provide numerical age control, suggesting that WS is as old as or older than Clovis. Cooper’s Ferry, Idaho, produced a range of dates from  $\sim 12,020$  to  $\sim 7300$   $^{14}\text{C}$  yr BP (Figure 12.5) on several different materials in association with WS artifacts (Davis and Schweger 2004). The investigators argue that the most likely date is  $\sim 11,370$   $^{14}\text{C}$  yr BP (although Fiedel and Morrow, 2012, argue that the younger dates are better age estimates). At Paisley Caves, Oregon, WS artifacts are in the same strata as twigs dated from  $\sim 11,815$  to  $\sim 11,070$   $^{14}\text{C}$  yr BP and human coprolites dated to  $\sim 11,340$  and  $\sim 11,205$   $^{14}\text{C}$  yr BP (Jenkins et al. 2012) (Figure 12.5). Smith Creek Cave, Nevada, produced WS artifacts in association with seven radiocarbon dates that range from  $\sim 11,140$  to  $\sim 10,570$   $^{14}\text{C}$  yr BP (Beck and Jones 2010) (Figure 12.5). Connelly Cave, also in Oregon, yielded two radiocarbon samples in association with WS materials, dating  $\sim 11,140$  and  $\sim 10,600$   $^{14}\text{C}$  yr BP (Figure 12.5) and shows that Classic Clovis and early Western Stemmed were contemporaneous (Pinson 2011; Beck and Jones 2010, 2012a,b). Western Stemmed might even precede Classic Clovis (Jenkins et al. 2012).

G. Haynes (2002:1) in his book on Clovis, states that

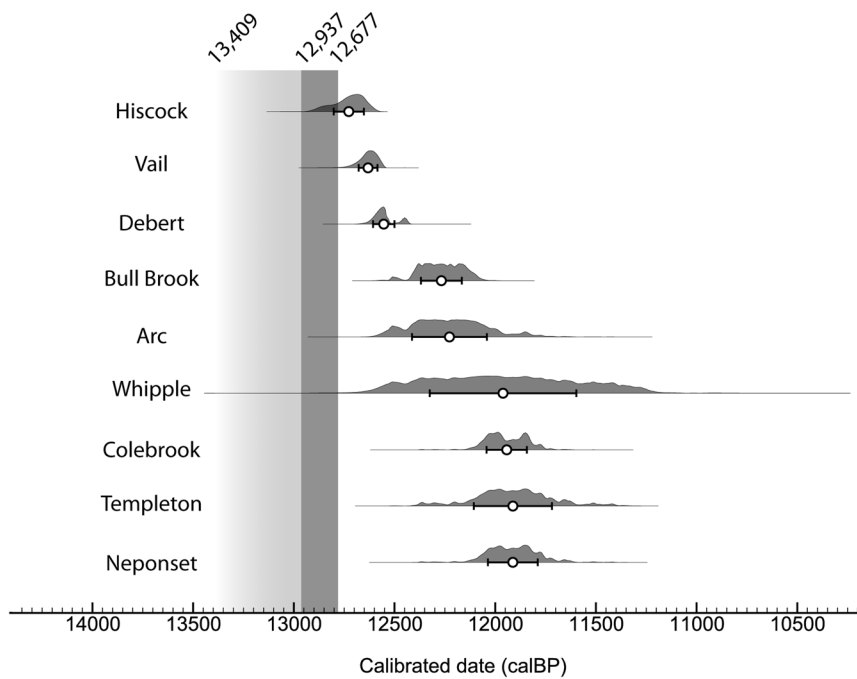
these artifacts were manufactured by widely separated prehistoric people at almost the same time throughout North America. . . . The fluted points from Nova Scotia are much the same as those from California.

Others see more significant geographic variation. For example, in their study of Clovis technology, Bradley et al. (2010:177–78) argue that

we see some areas in North America where there are Clovis-like points but where the rest of the technological package is either lacking or there is insufficient information (specifically in the Northeast and southern California).

We essentially agree with their view, but see more distinct spatial variability that also has a significant temporal component. There appear to be at least four general categories of projectile-point styles across North America related to Clovis





**Figure 12.3** The proposed age ranges for Classic Clovis (dark gray shade is the short chronology, light gray plus dark gray is the long chronology), and the summed probability distributions for radiocarbon dates from published dates for fluted-point sites in northeastern North America. See Table 20.1 for references to the dating.

in either space or time or both: Classic Clovis, Northeastern Fluted, Great Basin Fluted, and Western Stemmed. In the following section, we focus primarily on the range of variation in the context of the sites that are most frequently used to define Clovis technology in North America.

**The Context of “Classic Clovis”**

As a point of departure, we use the list of Clovis sites that Bradley et al. (2010) use as a baseline for describing typical Clovis material culture and what we refer to as “Classic Clovis.” The context of these sites is highly variable, and we argue that most Clovis sites can be placed into five categories (Table 12.2):

- 1) fluted-point sites associated with extinct fauna;
- 2) sites with Clovis points associated with radiocarbon dates;
- 3) buried deposits with distinctive Clovis technology;
- 4) dated sites without Classic Clovis artifacts; and
- 5) surface sites with Clovis technology.

**Fluted Points Associated with Extinct Fauna (Table 12.2)**

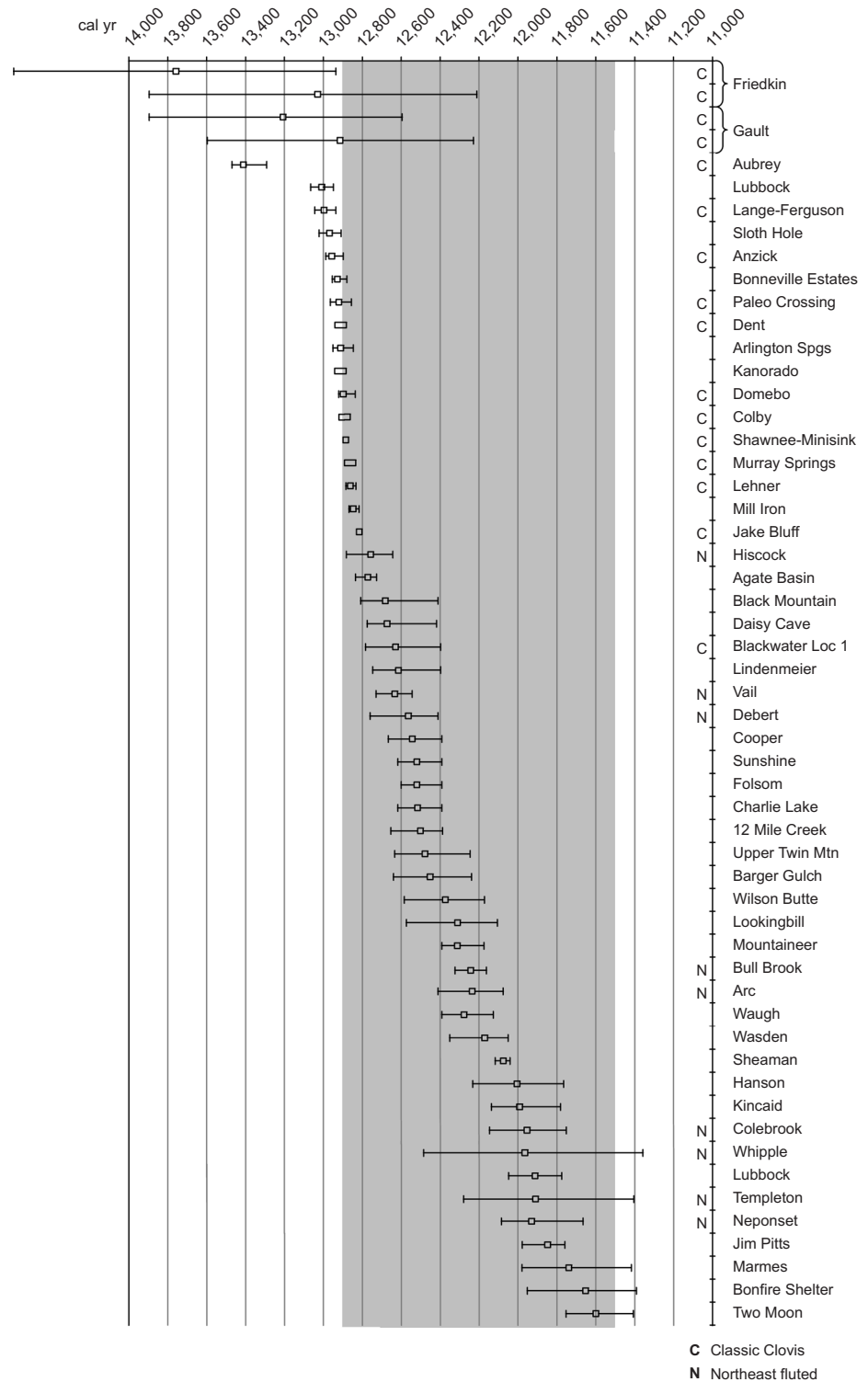
The stereotypical view of Clovis as mammoth hunters evolved with a series of spectacular discoveries from the 1930s through the 1950s. Dent, Colorado, and Miami, Texas, yielded mammoth with artifacts we now call Clovis, but at the time they were considered variants of Folsom. Work at the Clovis type site (a.k.a. Blackwater Draw Locality 1) through the 1930s and in the late 1940s and early 1950s produced similar finds, but also provided evidence for the chronologic and typologic distinction between Clovis and Folsom, thereby giving the name “Clovis” to the larger fluted projectile point style repeatedly found among the mammoth bone. Immedi-

ately thereafter, the Naco and Lehner sites in southeastern Arizona were discovered, excavated, and reported, followed by the Domebo Clovis mammoth site in Oklahoma. Classic Clovis artifacts were also found in association with mastodon at Kimmswick, Missouri (Graham et al. 1981), and with ex-

**Table 12.1** Radiocarbon dates from Northeast fluted sites.

Site	Date <sup>1</sup>	Error	n	Reference
Hiscock, NY	10,847	45	2	Laub 2002:108; Gingerich 2007:155
Vail, ME	10,710	50	1	Haynes et al. 1984; Gingerich 2007:155; Gramly 1982
Debert, NS	10,591	33	31	MacDonald 1985; Gingerich 2007:156
Bull Brook, MA	10,395	43	2	Robinson et al. 2009
Arc, NY	10,374	107	2	Tankersley et al. 1997; Gingerich 2007:155
Whipple, NH	10,261	231	2	Curran 1996; Gingerich 2007:155; Haynes et al. 1984
Colebrook, NH	10,226	48	2	Kitchel & Bosivert 2011; Gingerich 2007:156
Templeton, CT	10,213	87	2	McWeeney 1994; Moeller 1980; Gingerich 2007:156
Neponset, MA	10,210	60	1	Curran 1996; Gingerich 2007:156
Michaud, ME	10,200	620	1	Spieß and Wilson 1987; Gingerich 2007:156

<sup>1</sup> The dates are reported in radiocarbon years, <sup>14</sup>C yr BP. For sites or components with multiple radiocarbon dates, we average the dates using the “R Combine” function in OxCal 4.1 (Bronk Ramsey 2009). Multiple dates from a site with secure contexts were averaged for brevity in this table. Refer to the reference for a full list of dates.



**Figure 12.4** Boxplot of calibrated radiocarbon ages for key Clovis and other Paleo-Indian sites (modified from Meltzer and Holliday, 2010, figure 3, table 2). Calibration was done using CALIB 5.0.1. Symbols show calibrated midpoint (open box) and 1 standard deviation (vertical bars), ordered by decreasing calendar age. OSL dates for Gault and Friedkin sites are from Waters et al. (2011a,b). The shaded area represents the Younger Dryas Chronozone.

tinct bison at Murray Springs (Haynes and Huckell 2007) and Jake Bluff, Oklahoma (Bement and Carter 2010), and possibly extinct horse at Wally’s Beach, Alberta (Kooyman et al. 2006).

While many other sites have been proposed to represent direct evidence of human predation on megafauna, Grayson and Meltzer (2002) argue that there are only 14 instances that stand up to critical evaluation. Eleven of those sites yielded Clovis points directly associated with megafauna.<sup>1</sup> These sites

provide the typological baseline for describing Clovis-type projectile points, but are limited in terms of defining Clovis lifeways beyond the hunting of large mammals.

**Clovis Points associated with Radiocarbon-Dated Deposits (Table 12.2)**

In addition to the 14 sites associated with megafauna, other sites have been found that have Clovis-age deposits. These

include locations that appear to be campsites, such as Aubrey (Ferring 2001), Cactus Hill (McAvoy and McAvoy 1997; McAvoy et al. 2000), Paleo Crossing (Brose 1994), and Shawnee-Minisink (Gingerich 2007, 2011), or caches, such as Anzick (Morrow and Fiedel 2006). While these sites clearly play a role in the debate over a long vs. short chronology for Clovis (e.g., Waters and Stafford 2007 vs. Haynes et al. 2007), they are also instrumental in providing information on the nature of Clovis assemblages beyond megafaunal kill sites. Moreover, because of the presence of Clovis points and reliable radiocarbon dates, these assemblages can be securely associated with the primary kill sites from which the Clovis type was first described.

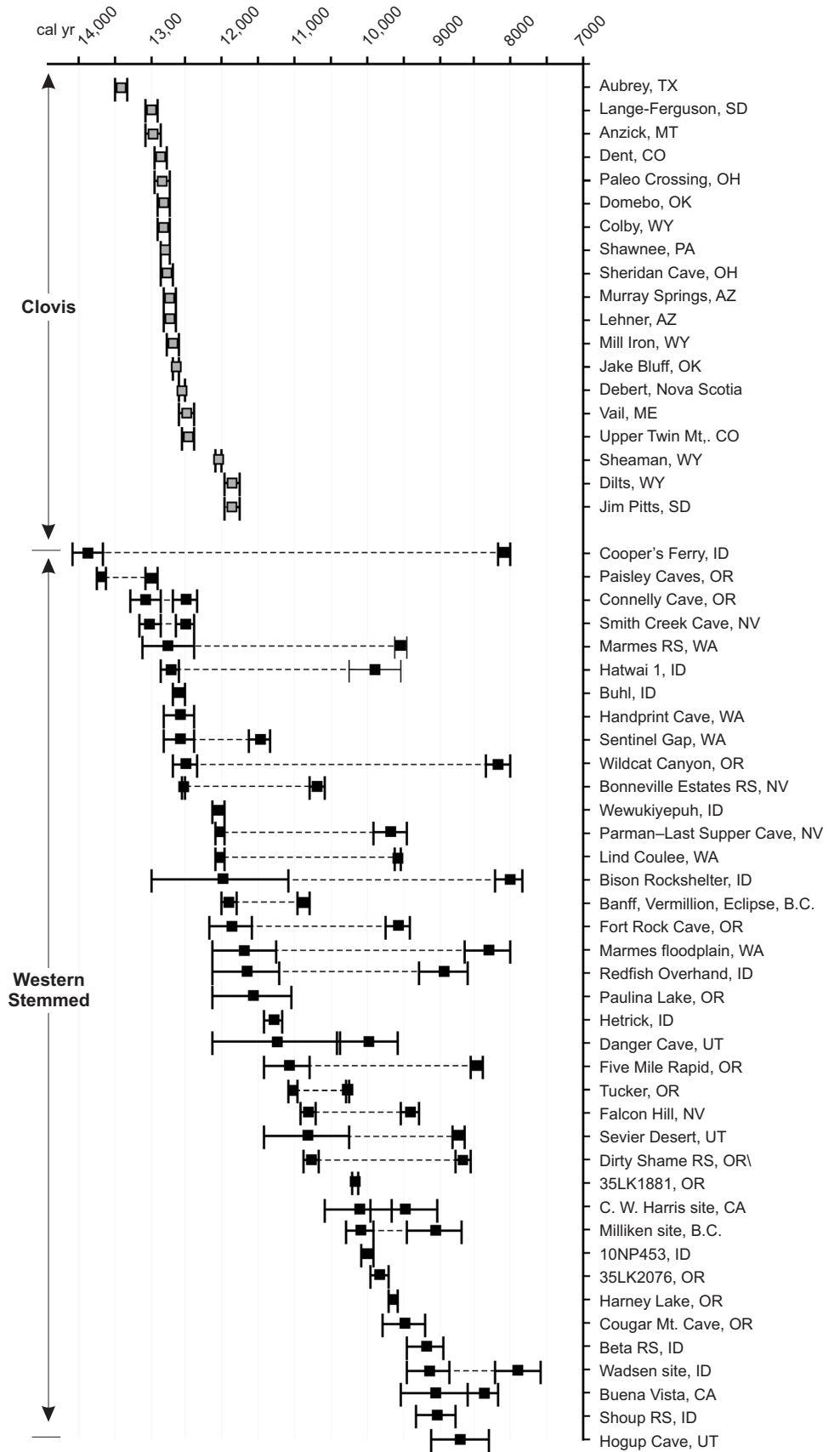
#### ***Buried Deposits with Distinctive Clovis Technology (Table 12.2)***

In other locations, information on Clovis material culture has been more fully outlined based on the presence of buried deposits containing Clovis points. Unlike sites in the

previous section, these sites often rely on the presence of fluted points matching the Clovis type description as the basis for determining the age of the deposits. These include several sites associated with quarries, such as Gault (Collins 2007; Waters et al., 2011), Topper (Goodyear and Steffy 2003; Smallwood et al. 2013), Carson-Conn-Short (Broster and Norton 1993, 1996), and Thunderbird (Gardner 1983; Carr et al 2013). However, at both Gault and Topper, because radiocarbon-datable material is not available, OSL dates were obtained, which helps to establish their age, albeit with much less precision than radiocarbon dating. Despite some ambiguity in establishing their age, these quarry sites, and in a few instances what appear to be associated habitation areas, have been extraordinarily valuable in providing information on a much broader range of tool forms present in Clovis assemblages, and have also provided manufacturing debris that gives insight into how Clovis assemblages were produced.

**Table 12.2** Key archaeological sites used to define Classic Clovis (modified and updated from Bradley et al. 2010, Table 1.1).

Site	Comments	References	Site	Comments	References
<b>Fluted points associated with extinct fauna</b>			Pavo Real, TX		Collins et al. 2003
Dent, CO	Clovis with mammoth	Brunswick 2007	Richey-Roberts, WA (East Wenatchee)	Clovis cache	Mehring & Foit 1990 Gramly 1993
Miami, TX	Clovis with mammoth	Sellards 1938	Simon, ID	Clovis cache	Butler, 1963 Kohntopp 2010
Clovis (Blackwater Draw), NM	Clovis artifacts associated with 6 mammoth kills	Hester 1972 Boldurian & Cotter 1999 Haynes & Warnica 2012	Carson-Conn-Short, TN		Broster & Norton 1996 Broster et al 2013
Naco, AZ	Clovis with mammoth	Hauray et al 1953	Topper, SC		Miller 2010 Smallwood et al. 2013
Lehner, AZ	Clovis with mammoth	Hauray et al. 1959 Haynes 1982	Big Pine, SC		Goodyear 1999
Murray Springs, AZ	Clovis mammoth kill, Clovis bison kill, and associated camp	Haynes & Huckell 2007	Widemeier, TN		Broster et al. 2006
Domebo, OK	Clovis with mammoth	Leonhardy 1966	Kevin Davis, TX	Clovis blade cache	Collins 1999
Kimmswick, MO	Clovis with mastodon	Graham et al. 1981	Hogeye, TX		Jennings 2012
Colby, WY	Clovis with 6 or 7 mammoth	Frison & Todd 1986	Sheaman, WY	Large blades and extensive debitage	Frison & Stanford 1982 Prasciunas 2013
Lange-Ferguson, SD	Clovis with mammoth	Hannus 1990	Thunderbird, VA		Gardner 1974, 1983 Carr et al 2013
Jake Bluff, OK	Clovis with bison	Bement & Carter 2010	<b>Dated sites without Classic Clovis artifacts</b>		
<b>Clovis points associated with radiocarbon dated deposits.</b>			Lubbock Lake, TX		Johnson 1987
Aubrey, TX	Multiple Clovis occupation loci	Ferring 2001	Wilson-Leonard, TX		Collins 1998
Paleo-Crossing, OH		Brose 1994	Pleasant Lake, MI	Butchered mastodon	Fisher 1984a,b
Sheridan Cave, OH		Tankersley 1997 Redmond & Tankersley 2005 Waters et al. 2009	Sloth Hole, FL		Hemmings 1999
Anzick, MT	Clovis artifacts associated with burial	Wilke et al 1991 Morrow & Fiedel 2006	<b>Surface sites with Clovis technology</b>		
Cactus Hill, VA		Wagner & McAvoy 2004	Mockingbird Gap, NM		Hamilton et al 2013
Fifty, VA		Gardner 1974, 1983 Carr et al 2013	El Bajio, Sonora	Clovis quarry and scattered occupations	Sanchez and Carpenter 2010, 2012
Shawnee-Minisink, PA		McNett 1985 Gingerich, 2011, 2013b	Dietz, OR		Willig 1988 Pinson 2011
<b>Buried deposits with distinctive Clovis technology</b>			Wells Creek Crater		Tune 2013
Gault, TX	Stratified Clovis occupation levels	Waters et al. 2011a	McFaddin Beach, TX	Artifacts washed onshore	Stright et al. 1999
			Plenge, NJ		Kraft 1973, 1977 Gingerich 2013a



**Figure 12.5** Boxplot of calibrated radiocarbon ages for key Clovis and Western Stemmed Tradition sites in the central and western United States. Radiocarbon dates were calibrated using CALIB 6.0 (<http://calib.qub.ac.uk/calib/>). Symbols designate the midpoint of the calibrated age range. Error bars denote the entire calibrated age range. Dashed lines between Western Stemmed Tradition symbols represent the best range of ages provided in the literature. Clovis dates (black and gray squares) are from Meltzer and Holliday (2010; table 2). Western Stemmed Tradition dates (black squares) are from Chatters et al. (2012), Smith and Kielhofer (2011), Beck and Jones (2010), Rhode et al. (2005), and Willig (1989).



### ***Dated Sites without Classic Clovis Artifacts (Table 12.2)***

There are several sites where Clovis-age radiocarbon dates have been derived, yet do not have Clovis-type bifaces present. At Sloth Hole, Florida, an ivory point was directly dated (Hemmings 2004, 2005). This artifact and others found at the site are similar to those found at other Clovis sites. Consequently, a case can be made that even though Clovis points were not found directly associated with the deposits, the presence of similar bone and ivory technology indicates that Clovis technology was present. In other instances, such as Lubbock Lake, Texas, Arlington Springs Woman in the Channel Islands off of the California Coast, and Bonneville Estates in Nevada, Clovis-age dates are present, but no diagnostic artifacts consistent with “Classic Clovis” were recovered. As a result, these sites are instrumental in documenting where people were on the landscape during the Clovis time slice; however, the people at these locations may not have necessarily been producing, using, and discarding artifacts we equate with Clovis material culture.

### ***Surface Sites with Clovis Technology (Table 12.2)***

In a number of cases, researchers have relied on surface sites that contain artifacts consistent with Clovis technology identified at other locations. The reliance on these types of sites is most prevalent in the southeastern United States, where sites containing buried Clovis-age deposits are very rare (Goodyear 1999). For example, the Adams site in Kentucky and the Williamson site in Virginia (Sanders 1990) appear to be lithic workshops that contain almost entirely Clovis assemblages. In other instances, sites such as the Quad Locality in northern Alabama (Soday 1954) and Wells Creek Crater in Tennessee (Dragoo 1965, 1973; Tune 2013) have produced Clovis bifaces, but also abundant artifacts from subsequent time periods. While the utilization of surface Clovis sites for analysis is most prevalent in the eastern United States, they are also utilized elsewhere in North America. For example, the Mockingbird Gap site is primarily composed of surface or shallowly buried deposits, but appears to be a pure Clovis assemblage that is the largest of its kind in the southwestern United States (Holliday et al. 2009; Hamilton et al. 2013). El Bajio in northern Sonora, Mexico, is an extensive scatter of habitation loci and at least one quarry/workshop, all producing a wide range of Classic Clovis tools (Sanchez and Carpenter 2012).

### **Conclusions**

Clovis artifact assemblages have been recognized across much of North America, largely based on recognition of Clovis projectile points in the assemblages. Variation in point styles and in other aspects of the broader lithic assemblage of Clovis has long been recognized, however, raising the question of “What is Clovis?” and how is a Clovis point or a Clovis site defined? In this paper, we outlined what we regard as a “Classic Clovis” style base on dated, in situ Clovis finds at classic mammoth kills from the Great Plains and Southwest during 1930s to the 1970s.

Two principal variants of Clovis are recognized based on technological characteristics and, to some extent, dating. Northeastern Fluted points are generally similar to Clovis but have a deep basal concavity. This style of artifact is distributed roughly parallel to the southeast Laurentide Ice front, extending from New York to the Maritime Provinces of Canada. It may have evolved from Classic Clovis as foragers moved into the freshly deglaciated landscape of the northeast. The age range is ~12.7k cal yr BP (~10,850 <sup>14</sup>C yr BP) (overlapping very late Classic Clovis) to ~11.9k cal yr BP (~10,200 <sup>14</sup>C yr BP). Western Fluted is a Western variant of Clovis most common in the Great Basin. It shares technological traits with Classic Clovis, but also varies in morphology. Age control is very poor, but like NF it probably evolved from and is younger than Classic Clovis.

Western Stemmed, another early Paleoindian style from the western U.S., has long been recognized as overlapping with late Classic Clovis. It may have been contemporaneous with Classic Clovis and perhaps has origins farther back in time.

Geographically, Classic Clovis artifacts are found throughout central North America south of the Ice-Free Corridor and east of the Rocky Mountains, in the mid-south and southeast U.S., and across the Southwest, but south and southeast of the Colorado Plateau down into northwest Mexico. There is also a narrow belt of Clovis finds across the northwestern U.S., from Wyoming to Washington. We define the age range of Classic Clovis as likely occurring from ~13.4k to ~12.7k cal yr BP (11,600 to 10,800 <sup>14</sup>C yr BP), although we acknowledge the difficulty in assessing this range with a handful of dated sites spread across an entire continent. Finally, we argue that not all Clovis sites are created equal, and outline the variety of contexts from which we derive our understanding of “What is Clovis?”

### **End Note**

<sup>1</sup>Lubbock Lake and Pleasant Lake did not produce Clovis artifacts in direct association with megafauna; Hebior is a pre-Clovis site.

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