

Response to Comment on “Redefining the Age of Clovis: Implications for the Peopling of the Americas”

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Haynes *et al.* misrepresent several aspects of our study. Our revised dates and other archaeological data imply that Clovis does not represent the earliest occupation of the Americas, and we offered both human migration and technology diffusion as hypotheses to explain the expansion of Clovis. We stand by the data and conclusions presented in our original report.

The comments of Haynes *et al.* (1) misrepresent aspects of our data and conclusions and are inconsistent with their own previously published views on Clovis. Haynes *et al.* imply that we presented chronological information from only “some” or a “sample” of Clovis sites. This is not true. We used dates from well-dated Clovis sites and obtained new dates on previously poorly dated sites in our analysis of the age of Clovis (2). First, the number of datable Clovis sites is inherently small. Second, we used the identical suite of Clovis sites, with the exception of the Aubrey site in Texas, used in previous studies to determine the Clovis time period (3). Third, it should be noted that previous studies (3) relied on ¹⁴C dates that were significantly less accurate, with large standard deviations, to determine the age range of Clovis. We are currently dating new samples from additional Clovis sites that only had wide bracketing ages listed in (2).

Haynes *et al.* (1) state that “new radiocarbon dates from a sample of Clovis sites do not prove by themselves that older ages for other Clovis sites are wrong.” This statement implies that “older” [~11,500 radiocarbon years before the present (¹⁴C yr B.P.)] Clovis sites exist, but only the Aubrey site is listed in (1). We demonstrated that the “older” Anzick and Sheaman dates are incorrect and that these sites are younger than previously reported (2). This leaves two problematical dates from Aubrey as the only “old” dates for Clovis. If the two dates from Aubrey are correct, then there is a 250- to 500-calendar-year gap between the oldest possible date for the firmly dated Clovis sites (2) and the dates from

Aubrey. Interestingly, Fiedel (4) and Haynes (5), two of the authors of the comment, have previously questioned the veracity of these ¹⁴C dates, and Surovell (6) and Huckell (7) also appear to be uncomfortable with the charcoal ages from Aubrey. Finally, we did not simply dismiss the ages from Aubrey; our concerns about the age of the site were provided in the Supporting Online Material of (2).

Several other points are misrepresented by Haynes *et al.* (1). Concerning the Clovis-Goshen date overlap, Goshen components at Jimmy Pitts and Upper Twin Mountain postdate Clovis (8, 9), whereas the dates from Mill Iron and Hell Gap do overlap Clovis dates by more than one SD (2). These ages were reported and accepted by Haynes (3). We clearly stated that the data indicate that the earliest phase of Goshen was either coeval with the entire range of Clovis or that it briefly overlapped only the final Clovis years. The early ages for Goshen overlap the Clovis ages from the Jake Bluff site in Wyoming. The Goshen complex clearly seems to have continued after Clovis. Also, we did not state that the early occupations at Bonneville Estates or Arlington Springs were not Clovis. We objectively stated that these sites were “Clovis-age” (2), because diagnostic artifacts are absent at these sites. Contrary to Haynes *et al.* (1), we did not offer diffusion as the only mechanism to spread Clovis technology. Rather, we offered both human migration and technology diffusion as hypotheses to explain the expansion of Clovis (2). Both hypotheses are viable and empirically testable.

Finally, Haynes *et al.* (1) state that we concluded our paper “with unsupported inference about the possibility of a spread of Clovis-point-making people, by speculating on an arbitrary extended length of time needed for human dispersal as far south as Tierra del Fuego.” The time span we used in our paper for the dispersal of humans from North America to South America via an inland route was based on the estimates

provided by Anderson (10) and Fiedel (11). We chose these models because they represent some of the fastest rates proposed for human colonization of the Americas. Others, such as Waguespack (12), have suggested that colonization of the Americas would have required at least 1000 years. We concluded that if our dates are correct, then there are only 300 to 350 years for this dispersal and that this is “highly improbable” if the rapid colonization models of Anderson (10) and Fiedel (11) are correct.

To move forward in our understanding of the process of the peopling of the Americas, we must shed outdated thinking, explore for early sites, and objectively evaluate new data. If a site lacks diagnostic artifacts but dates to 11,000 ¹⁴C yr B.P., it is not necessarily Clovis. A Clovis designation must be confirmed by the presence of Clovis diagnostic artifacts. Geological age does not equal culture or genetic lineage. We must probe older geological deposits to find pre-Clovis sites. Recognition of pre-Clovis artifacts may be difficult unless they are found in dated geological contexts. Unlike the iconic Clovis point, most of the artifacts recovered from Monte Verde, Schaefer, and Hebior are not characteristic enough to be recognized out of context. A new understanding of the peopling of the Americas will emerge as additional late Pleistocene sites are discovered and these sites yield new archaeological, genetic, and geological evidence. Any model of the peopling of the Americas must be based on empirical data—the facts and not our beliefs.

References and Notes

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