

Biostratigraphic evidence supports Paleoindian population disruption at ≈ 12.9 ka

Buchanan *et al.* (1) interpret an $\approx 40\%$ reduction in the cumulative probabilities of radiocarbon dates at the beginning of the Younger Dryas (≈ 12.9 ka) as noisy data inconsistent with human population decreases predicted by the extraterrestrial impact hypothesis (2). This reduction is, in fact, consistent with other biostratigraphic evidence suggesting an abrupt environmental perturbation at the onset of the Younger Dryas affecting human populations. Haynes (3) described a black sedimentary layer at 70 localities across North America dating to ≈ 12.9 ka as a stratigraphic marker horizon—where Clovis artifacts and select Rancholabrean fauna occur just below, but never within or above. Archeological sites containing both Clovis and immediately post-Clovis material are rare and, where present, are nearly always separated by culturally sterile sediments. Of the 11 well-dated credible Clovis sites (4), none has post-Clovis materials immediately above, suggesting a potential disruption in settlement or landscape use. The Clovis-age material at Blackwater Draw in New Mexico is poorly dated but is capped by a black sedimentary layer indicating a terminal age of 12.9 ka as summarized by Haynes (3) and ref-

erences therein. Folsom-age materials occur above the Clovis materials, but a hiatus of ≈ 500 years is suggested by an intervening sterile deposit (10–35 cm) and radiocarbon ages of 12.4–11.8 ka (3). This is also the case at the well-dated Clovis deposits at Shawnee-Minisink (≈ 12.9 –12.8 ka) in Pennsylvania, which are separated from an upper Early Archaic deposit (≈ 11.5 ka) by 1.71 m of sterile deposits (5). When biostratigraphic and radiocarbon evidence are taken together, they point to a post-Clovis decline in human populations consistent with the Younger Dryas impact hypothesis.

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