PERSPECTIVE

Were Hominins in California ~130,000 Years Ago?

Todd J. Brajea, Tom D. Dillehayb, Jon M. Erlandsonc,d, Scott M. Fitzpatrickc,d, Donald K. Grayson,e, Vance T. Hollidayf, Robert L. Kellyg, Richard G. Kleinb, David J. Meltzerh, and Torben C. Rickj

aDepartment of Anthropology, San Diego State University, San Diego, CA, USA; bDepartment of Anthropology, Vanderbilt University, Nashville, TN, USA; cDepartment of Anthropology, University of Oregon, Eugene, OR, USA; dMuseum of Natural and Cultural History, University of Oregon, Eugene, OR, USA; eDepartment of Anthropology and Quaternary Research Center, University of Washington, Seattle, WA, USA; fSchool of Anthropology & Department of Geosciences, University of Arizona, Tucson, AZ, USA; gDepartment of Anthropology, University of Wyoming, Laramie, WY, USA; hDepartment of Biology, Stanford University, Palo Alto, CA, USA; iDepartment of Anthropology, Southern Methodist University, Dallas, TX, USA; jDepartment of Anthropology, National Museum of Natural History, Smithsonian Institution, Washington, DC, USA

ABSTRACT

In a controversial study published in Nature, Holen et al. (2017) claim that hominins fractured mastodon bones and teeth with stone cobbles in California ~130,000 years ago. Their claim implies a human colonization of the New World more than 110,000 years earlier than the oldest widely accepted archaeological sites in the Americas. It is also at odds with genetic and fossil evidence for the dispersal of anatomically modern humans (Homo sapiens) out of Africa and around the world. Recognizing the incompatibility of their claim with extant knowledge, the authors suggest that the Cerutti Mastodon locality might have been created by an as-yet unidentified archaic hominin, for which no fossil, archaeological, or genomic evidence currently exists in northeast Asia or the Americas. We assess Holen et al.’s (2017) supporting evidence and argue that such extraordinary claims require extraordinary evidence, which their paper and supporting materials fail to provide.

In defense of their claim that the Cerutti Mastodon locality (CML) was created by humans, Holen et al. (2017) offer four criteria for recognizing and accepting an early archaeological site: (1) archaeological evidence is found in a clearly defined and undisturbed geologic context; (2) age is determined by reliable radiometric dating; (3) multiple lines of evidence from interdisciplinary studies provide consistent results; and (4) unquestionable artifacts are found in primary context. Here, we evaluate the CML in light of their criteria 1, 3, and 4. We do not question the Uranium series age derived from the mastodon bones. It may be valid, but if the material being dated is not modified by humans, the age is archaeologically irrelevant.

A hallmark of archaeological research is establishing stratigraphic context, control, and integrity. The remnants of the CML were excavated 25 years ago during a salvage paleontology project related to highway construction. Context is crucial for evaluating the purported processing of mastodons by humans at the CML, but the data required to fully understand the context of the bones and stones are not presented. Although limited discussion of the site’s geographic context, stratigraphy, soils, and taphonomic history is presented, much of this information is inadequate and lacking a full stratigraphic section and a detailed map showing the relationship of the locality to surrounding landforms. Currently, it is impossible for readers to evaluate whether the cobbles critical to Holen et al.’s (2017) case could have been derived naturally from surrounding landforms or depositional settings.

Holen et al. (2017) claim to present multiple lines of evidence establishing a hominin presence in California ~130 thousand years ago (kya), but their conclusions are based primarily on a series of modern experiments suggesting that humans could have fractured mastodon bones and teeth, producing fracture patterns and striations consistent with those identified on bones and cobbles recovered at the CML. They offer no alternative hypotheses that fully assess the role of natural taphonomic processes in producing those same products. Instead, their analysis is a classic illustration of the fallacy of “Affirming the Consequent”: because humans could have fractured the CML mastodon remains does not mean they did fracture them. Holen et al. (2017) fail to demonstrate that only hominins could have fractured and modified the CML bones and teeth, nor that the “artifacts” are of cultural origin rather than geofacts.

CONTACT Todd J. Braje tbraje@mail.sdsu.edu
© 2017 Center for the Study of the First Americans
They also offer no explanation for why or how hominins would deeply impale one tusk more or less vertically into the sediments underlying the bone bed layer.

Archaeologists and paleontologists have spent decades studying breakage patterns and other modification to animal bones, focusing on everything from weathering to animal trampling, burrowing, scavenging, and processing by hominins (Lyman 1994). Taphonomic and modern surface assemblage studies demonstrate that spiral fractures of the sort displayed by the CML mastodon can result from trampling or wallowing by large herbivores, including elephants (Haynes 1988; McComb, Baker, and Moss 2006). With evidence as ambiguous as broken bones/teeth and nondescript broken or battered cobbles, it is not enough to demonstrate the CML mastodon remains could have been broken/modified by humans. Holen et al. (2017) must demonstrate that the bones could not have been broken by natural forces. The fact that some bones within the stratum were broken while others were not has little or no value as an indicator of the potential archaeological nature of the locality.

The purported stone tools from the CML could also be readily explained by natural processes. Similar to the bone breakage, Holen et al. (2017) demonstrate that the battering patterns on these stones could be from processing mastodon bones, but experimental evidence that separates the action of natural processes from intentional human actions is absent (see Andrefsky 2013). In fluvial settings, for instance, well-rounded cobbles such as those depicted by Holen et al. (2017) can be eroded from higher landforms, roll considerable distances after being dislodged, and end up battered and spalled in sediments more typical of low-energy depositional environments. Striking in their absence are any unambiguous chipped stone tools, although hominins were making clearly recognizable stone tools throughout Africa and Eurasia 130 kya, ranging from formal tools to expedient flakes. There is no shortage of quality toolstone in the San Diego area, and the absence of clearly modified chipped stone tools at the CML is damning to their case.

Extraordinary claims require extraordinary evidence, which has not been provided for an archaeological origin of the CML. If the antiquity of hominins in the New World is to be extended more than 110,000 years, the archaeological evidence must be unequivocal. Despite extensive research in sediments of Last Interglacial age, including previously debunked claims from southern California (Carter 1980; Leakey, De Ette Simpson, and Clements 1968), scientists have found nothing to indicate hominins were in the New World – or even in far northeast Asia – before ∼50 kya (Meltzer 2009). The oldest widely accepted archaeological site in the Americas, Monte Verde, is only ∼14.6 kya, or possibly as early as 16–18 kya (Dillehay et al. 2008, 2015). It has taken archaeologists decades of careful survey, excavation, analysis, and critical debate to break the Clovis barrier and extend the chronology of New World colonization back a few millennia. A late Pleistocene colonization of the New World is further supported by genetic evidence that points to human movement from Asia to the Americas no more than about 25 kya (Raghavan et al. 2015). If hominins were living along the ancient California Coast by 130 kya – an environment rich in terrestrial, riverine, estuarine, and marine resources – what happened to them? It is highly improbable that they simply died out, or that archaeologists have missed evidence of >100,000 years of human occupation of the New World. The most parsimonious explanation for the CML faunal remains and purported artifacts is that they were created by natural processes, not by human agency. A key step forward will be additional research by independent researchers to further evaluate the CML materials and the claim that they were modified by humans.

Acknowledgments

We thank Ted Goebel and the editorial team at Paleoamerica for their help with the production of our manuscript.

Disclosure statement

No potential conflict of interest was reported by the authors.

Notes on contributors

Todd J. Braje is Professor of Anthropology at San Diego State University. He studies the prehistory of coastal environments, focusing on southern California, has three books and numerous academic articles, and is the co-editor of Journal of Island and Coastal Archaeology. He is the principle investigator on a large effort to identify submerged archaeological sites along the Pacific Coast of North America.

Tom D. Dillehay is the Rebecca Webb Wilson University Distinguished Professor of Anthropology, Religion, and Culture, and Professor of Anthropology and Latin American Studies at Vanderbilt University. His archaeological research in Chile and Peru has centered on the Pleistocene peopling of the Americas and the development of complex societies in South America, and he has published 22 books and more than 300 journal articles and book chapters.

Jon M. Erlandson is Director of the Museum of Natural and Cultural History and Philip H. Knight Professor of Arts and Sciences at the University of Oregon. His research focuses on the development of maritime societies in prehistory, especially California, and he has published numerous books and hundreds of academic manuscripts.
Scott M. Fitzpatrick is Professor of Anthropology and Associate Director of the Museum of Natural and Cultural History at the University of Oregon. He specializes in the archaeology of island and coastal regions, especially the Caribbean and Pacific Rim, and is the founding co-editor of the Journal of Island and Coastal Archaeology.

Donald K. Grayson is Professor of Anthropology at the University of Washington and a member of the US National Academy of Sciences. He studies human ecology and zooarchaeology, and has published numerous books and articles focusing on Quaternary extinctions, prehistoric subsistence, and paleoecology of the Great Basin and southwestern France.

Vance T. Holliday is Professor of Anthropology and Geosciences at the University of Arizona, where he directs the Argonaut Archaeological Research Fund, devoted to investigating the Paleoindian archaeology of the greater American Southwest. He also is a leading scientist on an international team investigating the Upper Paleolithic prehistory of European Russia.

Robert L. Kelly is Professor of Anthropology at the University of Wyoming. His research interests include the archaeology and ethnology of hunter-gatherers, and currently he is editor of the journal American Antiquity. The most recent of his 18 books is The Fifth Beginning: What Six Million Years of History Can Tell Us About Our Future (University of California Press).

Richard G. Klein is the Anne T. and Robert M. Bass Professor of Anthropology and Biology at Stanford University. His research focuses on the evolution of human behavior during the Pleistocene, from a biocultural perspective incorporating both archaeological and fossil evidence. He has edited the Journal of Archaeological Science since 1981, and is a member of the US National Academy of Sciences.

David J. Meltzer is the Henderson-Morrison Professor of Prehistory at Southern Methodist University and a member of the US National Academy of Sciences. His research focuses on North American Paleoindians and the peopling of the Americas, and he has written numerous books on these topics, as well as on the history of American archaeology, his newest being The Great Paleolithic War: How Science Forged an Understanding of America’s Ice Age Past (University of Chicago Press).

Torben C. Rick is Curator of North American Archaeology and Chair of the Department of Anthropology at the National Museum of Natural History, Smithsonian Institution. He studies the archaeology and historical ecology of coastal and island societies, focusing on the Pacific and Atlantic coasts of North America. He has published five books and numerous articles.

ORCID
David J. Meltzer http://orcid.org/0000-0001-8084-9802
Torben C. Rick http://orcid.org/0000-0002-8254-5885

References