

## North American overkill continued?

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Received 26 August 2003; received in revised form 30 August 2003; accepted 4 September 2003

### Abstract

Fiedel and Haynes misrepresent many of the arguments we have made concerning the overkill hypothesis. We clarify some of these mischaracterizations and call attention to some of the factual and logical errors in their paper.

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*Keywords:* Pleistocene extinctions; North America; Clovis; Radiocarbon dating; Monte Verde

We thank Fiedel and Haynes [6] for their response to our recent discussions of Martin's overkill hypothesis [10,13,14]. Although many of the issues they raise are worthy of extended discussion, our response here is brief. Our main goal is to call attention to misrepresentations of what we have argued. Because there are so many of these, we simply point out a few as a means of alerting readers to the fact that they exist, and that an accurate understanding of our arguments cannot be had from their reply.

Fiedel and Haynes maintain that Grayson and Meltzer advise readers to trust us "because we are experts on Pleistocene North America, whereas overkill advocates such as Martin, John Alroy, and Flannery are not." No statements in any of the three papers cited by Fiedel and Haynes [10,13,14] make such an assertion or question Paul Martin's profound knowledge of the North American Pleistocene. We disagree with Martin's explanation of North American late Pleistocene extinctions and we strongly question whether his version of that explanation can be tested empirically, but we do not and would not question the depth of his knowledge of this time and place. Similarly, we do not see that we have in any way questioned the expertise of Tim Flannery,

one of the world's leading experts on Australian Pleistocene extinctions, nor would it ever occur to us to do so. We are pleased to have this opportunity to express our high personal and intellectual regard for both Martin and Flannery.

On the other hand, the three papers to which Fiedel and Haynes are responding [10,13,14] observe that the overkill position is being used for essentially political purposes by many scientists who are not well-versed in the paleontology and archaeology of late Pleistocene America. Compared to these scientists, we do possess expertise in this realm, just as Gary Haynes does. Examples of such political uses abound. Pleistocene overkill is coupled with current global human impacts by Western [29], with the threat of nuclear holocaust by Diamond [5], with the loss of fisheries during industrial times by Ward [28], with modern market hunting by Murray [20], and so on. It is telling that in the print version of his essay, Murray's most recent citation to the overkill debate is to a paper published in 1973 [17]. None of these people can be considered to be experts in Pleistocene archaeology or paleontology, and that is our point. To us, it is somewhat ironic that the same journal that published Murray's article also published Michael Ruse's discussion of evolution as a secular religion [26], since it is our claim that while the overkill hypothesis could be good science and has led to significant increases in knowledge, it is, in its current form, largely immune to empirical tests. Among many

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ecologists, it is both taken on faith and used frequently in the context of green politics [14].

Fiedel and Haynes refer to our “newfound pre-Clovis convictions” as being “integral to (our) rejection of overkill”. This statement seriously misreads our position. We explicitly stated that any convictions we may or may not have concerning the pre-Clovis archaeology of the New World are unrelated to our assessment of overkill. We also observed that Monte Verde is “likely to be irrelevant to Martin’s argument” ([13], p. 346) and that no matter what one makes of this site, “Clovis ... provides the earliest secure North American evidence that people did, in fact, encounter now-extinct large mammals” ([14], p. 588; see also Ref. [10], p. 37). In fact, although Martin dismisses the search for pre-Clovis sites as “something less than serious science, akin to the ever popular search for ‘Big Foot’ or the ‘Loch Ness Monster’ ” ([18], p. 278), he has also made overkill immune to the timing of entry of people into the New World. This we discuss in some detail [10,13].

Fiedel and Haynes observe that we “strangely omit” any discussion of the many  $^{14}\text{C}$  dates run on large mammal bones by Graham, Stafford and their colleagues. In fact, we discuss the North American extinctions chronology in detail, including the unpublished results of the dating project to which Fiedel and Haynes refer. The total of 15 North American genera that we cite as having terminal radiocarbon ages younger than 12,000 BP was checked for accuracy by Graham, and his help was carefully acknowledged by us [10,13]. We have now checked with Graham again and he has reiterated to us that “your comments regarding the radiocarbon dates are exactly correct” (R. W. Graham, personal communication, 2003).

Fiedel and Haynes criticize us for (1) observing that 15 North American genera have been dated to between 12,000 and 10,000  $^{14}\text{C}$  BP, (2) noting that this leaves open the possibility that many genera became extinct before that time, and (3) failing to observe that all 15 extinctions have been tightly pinned to 11,400–10,800  $^{14}\text{C}$  BP. However, the reason we mentioned that 15 genera have been shown to have lasted beyond 12,000  $^{14}\text{C}$  BP is to make the very point they accuse us of not making: that these survivals were “into Clovis times” ([10], p. 38). That is, we fully and explicitly accepted precisely what Fiedel and Haynes accuse us of rejecting. That the radiocarbon record for extinctions has a “certain irresolvable ambiguity” and only reflects a “*terminus post quem*” are points made by Meltzer and Mead [19] some two decades ago.

Fiedel and Haynes further assert that Grayson and Meltzer “do not acknowledge that these (Clovis-age) dates fatally undermine their arguments for gradual climate change as the cause of the extinctions”. There are multiple misreadings of our position here. We have not argued that gradual climate change was behind all of

these extinctions. Instead, as Grayson ([10], p. 39) stated, the “point has been not that the extinctions were necessarily gradual, but that we do not know when a majority of them occurred and that we should not assume, as Martin does, that they all occurred at about 11,000 years ago”. Furthermore, the full argument made by Grayson and Meltzer [13] is not about the taxa that can be shown to have become extinct during Clovis times, but about the assumption that if 15 genera have been shown to have become extinct between 12,000 and 10,000 years ago, then all 35 genera must have become extinct during those times. It was this logical leap that lead us to observe that “assuming that the extinctions were synchronous requires that we attribute to the extinction ‘event’ a set of properties, most notably speed and taxonomic breadth, that it may or may not have possessed. Once that is done, explanations of the extinctions must be structured to account for those assumed properties” ([13], p. 346). Just as important, our critique in this area is addressed not just to overkill adherents, but to all who assume that the extinctions were both synchronous and confined to the terminal Pleistocene [9]. We refer the reader to our earlier papers for more details.

There are so many mischaracterizations of this sort in Fiedel and Haynes’ reply that we cannot list them here, nor do we think that it would be of much value for us to do so. Instead, we ask the reader to compare what we actually said to what Fiedel and Haynes assert that we said. We are happy to live with the results of such a comparison.

Finally, a few other matters. We are pleased that Fiedel and Haynes applaud us for our detailed evaluation of the evidence for Clovis-age hunting of now-extinct Pleistocene mammals, and that they accept the results of that evaluation. This is especially important to us since Haynes’ significant methodological contributions in this realm were critical to our evaluation of that evidence.

However, there are many statements they make about the nature of the late Pleistocene and Holocene records that we question. A few examples will have to suffice. First, the black mats of arid southwestern North America are time-transgressive and do not “typically” date to ca. 10,700  $^{14}\text{C}$  yr BP. In far southern Nevada, for instance, “periods of black mat formation ... extend from 11,800 to 6300, and 2300 to modern  $^{14}\text{C}$  yr” (Ref. [24], p. 148). Fiedel and Haynes’ assertion that these mats provide a clear stratigraphic marker for the extinction event is incorrect.

Second, it is not true that archaeological sites in eastern North America have yet to yield “the remains of any butchered carcasses of elk, deer, bear, or woodland bison of Holocene age.” In fact, the remains of deer (*Odocoileus virginianus*) are extremely abundant in those sites, as has long been recognized [1,16,21–23,25,27].

Were the bones of *Platygonus*, *Mylohyus*, *Tapirus* and other extinct taxa widely represented in Clovis-age sites, we would gladly concede the point. Instead, and as Fiedel and Haynes agree, only mammoth and mastodon have been found in such contexts.

Finally, Fiedel and Haynes cite Jochim et al. [15] in noting that parts of Europe were abandoned by people during the Last Glacial Maximum and then recolonized. Fiedel and Haynes then argue that the “explosive re-colonization” by Magdalenian groups had “dire consequences” for the “locally naïve” late Pleistocene mammals of Europe. However, Jochim et al. [15] also observe that southwestern France and adjacent northern Spain saw “continuous occupation throughout the last glacial period” ([15], p. 130) and that it was from this refugium that Magdalenian recolonization occurred. Of course, this refugium has a detailed record of human predation on large mammals, extending back into Mousterian times [2,11,12], yet also saw significant late Pleistocene extinctions [3,4]. Fiedel and Haynes’ argument must thus find that overkill occurred whether the fauna was locally naïve or not, and was a consequence both of continuous human occupation (as in southwestern France) and of the sudden arrival of human colonizers (as in other parts of western Europe). It is precisely this kind of logic that has typified the overkill position, rendered it unfalsifiable, and placed it beyond the reach of science [7,9,10,13,14].

Attempts to explain Pleistocene extinctions extend deep into the 19th century [8]. Martin’s development of the overkill model in the 1960s articulated the idea in ways that allowed it to be explored with unprecedented thoroughness [7,10,14]. However, across some four decades of advocacy (*sensu Ref. [7]*), overkill has become untestable. The overkill position has also, despite a clear lack of empirical archaeological support, been adopted on faith by an influential subset of ecologists and used to support what are essentially political arguments. At the same time, sufficiently detailed alternative hypotheses to account for this phenomenon have yet to be developed [13,14]. If this interchange helps in any way to return overkill to the realm of science or helps lead to the development of alternative accounts, we will be most pleased.

### Acknowledgements

We thank Russell W. Graham for comments on a draft of this paper.

### References

[1] C.E. Cleland, The prehistoric animal ecology and ethnozoology of the Upper Great Lakes region, Museum of Anthropology, University of Michigan, Anthropological Papers 29, 1966.

- [2] F. Delpech, Les faunes du Paléolithique supérieur dans le sud-ouest de la France, Cahiers du Quaternaire 6 (1983).
- [3] F. Delpech, Biomasse d’ongulés au Paléolithique et inférences démographiques, *Paléo*. 11 (1999) 19–42.
- [4] F. Delpech, L’environnement animal des européens au Paléolithique supérieur, in: R. Desbrosse, A. Thévenin (Eds.), *L’Europe préhistorique*, Editions du CTHS, Paris, 2003, pp. 271–289.
- [5] J.M. Diamond, *The Third Chimpanzee: The Evolution and Future of the Human Animal*, HarperCollins, New York, 1992.
- [6] S. Fiedel, G. Haynes, A premature burial: comments on Grayson and Meltzer’s “Requiem for overkill”, *Journal of Archaeological Science*, in press. doi:10.1016/j.jas.2003.06.004.
- [7] D.K. Grayson, Explaining Pleistocene extinctions: thoughts on the structure of a debate, in: P.S. Martin, R.G. Klein (Eds.), *Quaternary Extinctions: A Prehistoric Revolution*, University of Arizona Press, Tucson, 1984, pp. 807–823.
- [8] D.K. Grayson, Nineteenth-century explanations of Pleistocene extinctions: a review and analysis, in: P.S. Martin, R.G. Klein (Eds.), *Quaternary Extinctions: A Prehistoric Revolution*, University of Arizona Press, Tucson, 1984, pp. 5–39.
- [9] D.K. Grayson, Late Pleistocene extinctions in North America: taxonomy, chronology, and explanations, *Journal of World Prehistory* 5 (1991) 193–232.
- [10] D.K. Grayson, The archaeological record of human impacts on animal populations, *Journal of World Prehistory* 15 (2001) 1–68.
- [11] D.K. Grayson, F. Delpech, Specialized early Upper Paleolithic hunters in southwestern France? *Journal of Archaeological Science* 29 (2002) 1439–1449.
- [12] D.K. Grayson, F. Delpech, Ungulates and the Middle-to-Upper Paleolithic transition at Grotte XVI (Dordogne, France), *Journal of Archaeological Science*, 30 (2003) 1633–1648.
- [13] D.K. Grayson, D.J. Meltzer, Clovis hunting and large mammal extinction: a critical review of the evidence, *Journal of World Prehistory* 16 (2002) 313–359.
- [14] D.K. Grayson, D.J. Meltzer, A requiem for North American overkill, *Journal of Archaeological Science* 30 (2003) 585–593.
- [15] M. Jochim, C. Herhahn, H. Starr, The Magdalenian colonization of southern Germany, *American Anthropologist* 101 (1999) 129–142.
- [16] M. Kneberg, The Tennessee area, in: J.B. Griffin (Ed.), *Archaeology of Eastern United States*, University of Chicago Press, Chicago, 1952, pp. 190–198.
- [17] P.S. Martin, The discovery of America, *Science* 179 (1973) 969–974.
- [18] P.S. Martin, Deep history and a wilder west, in: R.H. Robichaux (Ed.), *Ecology of Sonoran Desert Plants*, University of Arizona Press, Tucson, 1999, pp. 256–290.
- [19] D.J. Meltzer, J.I. Mead, Dating late Pleistocene extinctions: theoretical issues, analytical bias and substantive results, in: J.I. Mead, D.J. Meltzer (Eds.), *Environments and Extinctions: Man in Late Glacial North America*, Center for the Study of Early Man, University of Maine, Orono, 1985, pp. 145–174.
- [20] M. Murray, Overkill and sustainable use, *Science* 299 (2003) 1851–1853.
- [21] T.W. Neumann, Human-wildlife competition and the Passenger Pigeon: population growth from system destabilization, *Human Ecology* 13 (1985) 389–410.
- [22] T.W. Neumann, The structure and dynamics of the prehistoric ecological system in the eastern Woodlands: ecological reality versus cultural myths, *Journal of Middle Atlantic Archaeology* 5 (1995) 29–57.
- [23] T.W. Neumann, The role of prehistoric peoples in shaping ecosystems in the eastern United States: implications for restoration ecology and wilderness management, in: C.F. Kay, R.T. Simmons (Eds.), *Wilderness and Political Ecology: Aboriginal*

- Influences and the Original State of Nature, University of Utah Press, Salt Lake City, 2002, pp. 141–178.
- [24] J.R. Quade, R.M. Forester, W.L. Pratt, Black mats, spring-fed streams, and late-glacial recharge in the southern Great Basin, *Quaternary Research* 49 (1998) 129–148.
- [25] W.A. Ritchie, *The Archaeology of New York State*, The Natural History Press, Garden City, 1965.
- [26] M. Ruse, Is evolution a secular religion? *Science* 299 (2003) 1523–1524.
- [27] B.D. Smith, Middle Mississippi exploitation of animal populations, *Museum of Anthropology, University of Michigan, Anthropological Papers* 57, 1975.
- [28] P.D. Ward, *Rivers in Time: The Search for Clues to Earth's Mass Extinctions*, Columbia University Press, New York, 2000.
- [29] D. Western, Human-modified ecosystems and future evolution, *Proceedings of the National Academy of Sciences* 98 (2001) 5458–5465.