A *Bison antiquus* from Archuleta Creek, Folsom, New Mexico

David J. Meltzer, Daniel H. Mann, and Jason M. LaBelle

The remains of a bison were recently discovered along Archuleta Creek, a tributary of the Dry Cimarron River, at a spot just ca. 4 km from the Folsom type site. The bones were exposed in a deeply undercut, eroding section of the south bank of the creek. They consisted of a series of ordered vertebrae lying flat with their dorsal surfaces protruding out of the stream bank, suggesting the skeleton was on its side, oriented roughly parallel to the present drainage. The remains were found ca. 4 m below the present surface, lying along the upper, undulating surface of what appeared to be Pleistocene-age gravel, and largely contained within and overlain by fine, overbank sediments.

On initial field examination it was apparent the bones were from a very large bison, perhaps an animal within the size range of *Bison antiquus*. Its suspected age and taxonomic identity, and proximity to the Folsom site, raised the question of whether it was a paleontological or an archaeological occurrence, and, if the latter, whether the animal had escaped from the kill at Folsom and died on the floor of this nearby drainage.

The layout of the exposed vertebrae suggested much of the skeleton was still contained within the bank, but removing it would require deeply undercutting an already undercut profile, endangering both the skeletal remains and the crew. It was decided to excavate only the visible and most vulnerable skeletal elements and to examine the remains for associated artifacts.

Ultimately, 14 bones were exposed. All are part of the vertebral column, and include the atlas and axis, thoracic spines, lumbar vertebrae (including the sacrum), and scattered rib fragments. The bones occurred at intervals along a horizontal distance of ca. 2 m, but over a narrow vertical span (< 15 cm). The atlas and axis were removed for study; the remaining elements extended too deeply into the wall for safe removal. The latter were recorded, plaster-jacketed, covered, and left in situ. A rock diversion wall was built to deflect the stream's energy away from the section.

In general the bone is in excellent condition, having had only minimal subaerial exposure and surface weathering, and no apparent carnivore modification. With a few exceptions, the bones were flat or nearly so. Modal inclination values were < 5°, which, along with the lack of patterned orientation and the absence of scratch marks on the bone surface, suggest fluvial reworking or animal trampling was minimal. There was, however, some slight post-mortem but pre-disarticulation contortion: both the neck and sacrum

David J. Meltzer, Department of Anthropology, Southern Methodist University, Dallas, TX 75275-0336; e-mail: dmeltzer@mail.smu.edu

Daniel H. Mann, Institute for Arctic Biology, University of Alaska, Fairbanks, AK 99775.

Jason M. LaBelle, Department of Anthropology, Southern Methodist University, Dallas, TX 75275-0336; e-mail: jlabelle@mail.smu.edu

twisted outward toward the stream bed. The cranium would thus have been one of the first elements exposed and lost when the bank began to erode.

The absence of a cranium hinders ready taxonomic identification. However, the atlas and axis can be compared with metric data on *Bison antiquus* from Bonfire (Texas) Bone Bed 2 (Dibble and Lorrain 1968) and Finley (Wyoming) (Haspel and Frison 1987), and *Bison bison* from Glenrock (Wyoming) (data collected by LaBelle) and Bonfire Bone Bed 3 (Dibble and Lorrain 1968). As seen in Table 1, the maximum breadth and maximum length (variables M1 and M2 in Haspel and Frison 1987) of the atlases of *B. antiquus* are larger than those of *B. bison*; the differences are not significant (as measured by *t* tests). In turn, the Archuleta atlas is much larger in both dimensions (though again not significantly) than *B. antiquus*. Similar results are obtained in comparisons using the axis. The Archuleta bison is thus within the range of *B. antiquus*, and was perhaps a (very) large bull.

A crucial question is whether the Archuleta specimen is the same antiquity as the Folsom bison, which have a mean radiocarbon age of 10,490 ± 20 RCYBP (Meltzer et al. 2002). The axis of the Archuleta bison yielded an age of 10,190 ± 30 RCYBP ($\delta^{13}C$ = -10.8) (CAMS-96033), younger by some 300 radiocarbon years than the remains at Folsom. When calibrated (CALIB 4.4), the respective radiocarbon ages overlap, but only at the 2-sigma level.

Although it seems unlikely that the Achuleta and Folsom bison were once part of the same herd, these ages fall squarely within the Younger Dryas, with its radiocarbon-distorting plateaus, and may ultimately prove to have a more significant temporal overlap. That said, we did not recover any Folsom artifacts in the sediment with the Archuleta remains. Barring any future discoveries of artifacts with the skeleton still deeply buried in the stream bank, we conclude the Archuleta bison died of natural causes, some time after the kill at Folsom.

Table 1. Summary mean metric data for atlas breadth (M1) and length (M2) for *Bison bison* and *Bison antiquus* specimens compared with the Archuleta bison (comparative published data from Dibble and Lorrain 1968, and Haspel and Frison 1987).

Species	Site	n	M1 (mm)	M2 (mm)
Bison bison	Bonfire Rockshelter Bone Bed 3; Glenrock (latter includes both males and females)	18	176.3	119.6
Bison antiquus	Bonfire Rockshelter Bone Bed 2; Finley	6	181.1	120.4
Bison sp. cf. *antiquus*	Archuleta bison	1	218.0	144.8

Bison of late-Glacial age are quite rare in this region—save for those at the Folsom site—but the Archuleta bison is important beyond simply providing an additional data point or showing that the Folsom herd is not an anomaly. There is emerging paleoecological evidence that the region in Younger Dryas times was prime bison habitat, at least in summer. The Folsom and Archuleta records confirm that bison were indeed present on that landscape; and, more importantly, their geomorphic settings may help us gain a better sense of why such remains are otherwise rare in the fossil record of the region.

We would like to thank Jim Doherty for permission to work on the site; Leo Quintanilla for logistical support; Ethan Meltzer for help with the excavations; Ryan Byerly for aid in the faunal analysis; and Paul Matheus for isotopic and radiocarbon analyses. This work was part of a larger project on the geomorphic history of the Upper Dry Cimarron River, conducted under the auspices of the Quest Archaeological Research Program, Southern Methodist University.

References Cited

Haspel, H., and G. C. Frison 1987 Appendix 7. The Finley Site Bison Bone. In *The Horner Site*, edited by G. C. Frison and L. Todd, pp. 475–91. Academic Press, New York.

Dibble, D., and D. Lorrain 1968 *Bonfire Shelter: A Stratified Bison Kill Site, Val Verde County, Texas.* Texas Memorial Museum, Miscellaneous Papers No 1.

Meltzer, D. J., L. C. Todd and V. T. Holliday 2002 The Folsom (Paleoindian) Type Site: Past Investigations, Current Studies. *American Antiquity* 67:5–36.