

Jack Wade Creek: An *in situ* Alaskan Late Pleistocene Vertebrate Assemblage

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ABSTRACT. Sixty Late Pleistocene vertebrate fossils have been recovered from an inferred *in situ* sedimentary section of a placer mine near Jack Wade, east-central Alaska. The fossil assemblage, called the Jack Wade fauna, is composed of the partial remains of 18 animals, of which 11 are *Ovis* sp. cf. *O. dalli* Nelson (Dall sheep), 3 *Bison priscus* (Bojanus) (Steppe Bison), 2 *Rangifer tarandus* (Linnaeus) (Caribou), 1 *Equus (Asinus) lambei* Hay (Yukon Wild Ass) and 1 *Alces alces* (Linnaeus) (Moose). The assemblage is noteworthy in two respects: it is one of few Late Pleistocene *in situ* assemblages known from Eastern Beringia and it is composed of large ungulates exclusively. Of these, a uniquely large proportion are mountain sheep.

Key words: Beringia, Pleistocene, fauna

RÉSUMÉ. Soixante fossiles de vertébrés du Pléistocène supérieur ont été tirés d'une section sédimentaire apparemment *in situ* dans une mine de placers près de Jack Wade, dans la partie centrale de l'est de l'Alaska. L'assemblage fossile, qu'on a nommé la faune Jack Wade, est composé des restes partiels de 18 animaux, dont 11 mouflons de Dall (*Ovis* sp. cf. *O. dalli* Nelson), 3 bisons des steppes (*Bison priscus* [Bojanus]), 2 caribous (*Rangifer tarandus* [Linnaeus]), 1 âne sauvage du Yukon (*Equus [Asinus] lambei* Hay) et 1 orignal (*Alces alces* [Linnaeus]). Cet assemblage est doublement important puisqu'à la fois, il comporte l'un des rares assemblages *in situ* du Pléistocène supérieur trouvés dans l'est de la Beringie et il est composé exclusivement d'ongulés de grande taille. Ceux-ci comprennent une proportion uniquement élevée de moutons de montagne.

Mots clés: Beringie, Pléistocène, faune

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INTRODUCTION

The partial remains of an unusual Late Pleistocene ungulate community have been recovered from the base of a 6 m placer section at Jack Wade, Alaska, a small community 320 km east of Fairbanks (64°09'00"N, 141°27'30"W; Fig. 1). Sixty fossil bones representing at least 11 Dall sheep (*Ovis dalli* Nelson) 3 large-horned bison (*Bison priscus* [Bojanus]), 2 caribou (*Rangifer tarandus* [Linnaeus]), 1 small Yukon horse (*Equus [Asinus] lambei* Hay) and 1 moose (*Alces alces* [Linnaeus]) were unearthed by George Robinson in frozen silt in the process of hydraulic gold mining. Radiocarbon analyses of hare coprolites (fecal pellets) at 5 m (QL 1213, 14 500 ± 3000 yr BP) and of bison horn core collagen at the 6 m base of the mine (QL 1178, 29 700 ± 240 yr BP) suggest the assemblage is a 30 000-year-old *in situ* faunal community (Fig. 2).

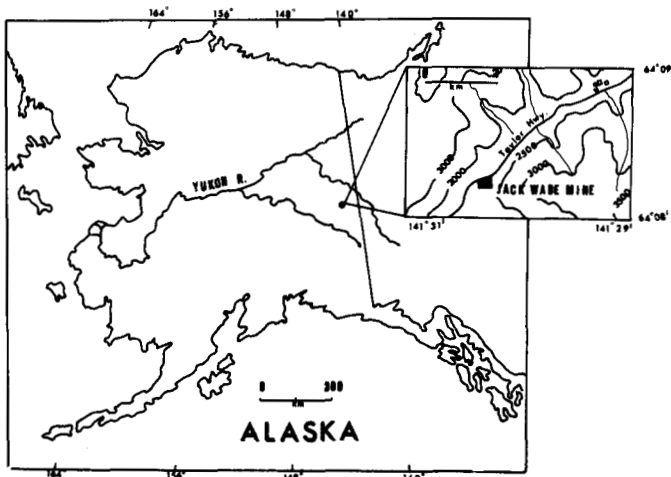


FIG 1. Map of Alaska showing location of Jack Wade fossil site.

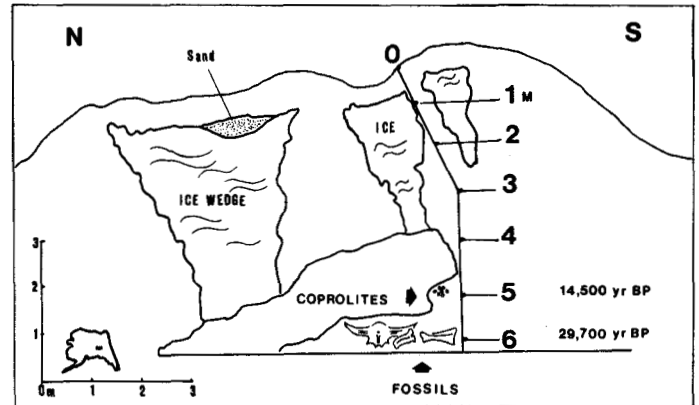


FIG 2. Stratigraphic relationships at the Jack Wade fossil site. Sediment was sampled at 1 m intervals, indicated by numbers 0-6. Radiocarbon dates of 14 500 ± 300 yr BP and 29 700 ± yr BP have been obtained from samples 5 and 6 respectively.

The fossils were buried in permafrost and were concentrated in a small 6 m² pile. The 60 bones were recovered from schistose orange sandy gravels resting upon schist bedrock beneath >5 m of organic silt (Fig. 2, Table 1). Predepositional transportation of the fossils, after death and prior to burial, is thought to be slight, as indicated by the nearly perfect preservation of one *Ovis* skull (Fig. 3, USNM 262426). The fossil remains were found disarticulated but otherwise structurally intact with unabraded epiphyses, trochanters and fossae.

RADIOCARBON DATING OF BONE AND COPROLITES

One of the bison horn cores recovered from the 6 m base of the mine was taken for ¹⁴C collagen dating. The mine's cutbank exposure also revealed a pod of hare coprolites, frozen in gray

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TABLE 1. Stratigraphic section of the Jack Wade Mine*

Unit	Description	Depth (m)
1	black organic, micaceous fine silt to fine sand, filled with leaves and rootlets	0-1
2	reddish and black micaceous silty sand (95% muscovite; 5% biotite)	1-2
3	gray micaceous silt and fine-grained reddish sand	2-3.5
4	gray micaceous silty sand	3.5-3.8
5	orange schist gravels	5.8-6.0
6	schist bedrock	6+

*Measured in the N1/2 SE1/4 Sec. 8, T 27N, R20E, Eagle A-2 Alaska quadrangle.

SYSTEMATICS

Equidae:

Equus lambei Hay 1917
6 elements
MNI = 1

Cervidae:

Rangifer tarandus (Linnaeus) 1758
7 elements
MNI = 2

Alces alces (Linnaeus) 1758
1 element
MNI = 1

Bovidae:

Ovis dalli Nelson 1884
19 elements
MNI = 11

Bison priscus (Bojanus) 1827
26 elements
MNI = 3

silt 1 m above the bone unit. The coprolites were taken for identification and ^{14}C and pollen analyses.

Philip Wilkinson of the Quaternary Isotope Laboratory, Quaternary Research Center, University of Washington, processed both bone and coprolite samples for ^{14}C in February 1979. Radiocarbon dates based upon bone collagen can be easily contaminated (Hassan and Ortner, 1977; Hassan and Hare, 1978), and for this reason particular care was taken to maintain the integrity of the bone sample. The bison horn core (QL 1178) was ultrasound washed, dried, crushed and ground in a Waring blender. The sample was then subjected to cold leaching with 1% HCl and repeatedly decanted and freshly leached, until a stable pH was achieved. The sample then was washed until the resulting rubbery collagen was neutralized. Thereafter, the collagen was boiled in acidified water for several hours, centrifuged, and the supernatant was dried by oven evaporation. A mass of 15.73 g of collagen supernatant solids was burned, producing 10.78 liter-volume of gas, and was subjected to CO_2 gas-proportional counting. The bison horn core specimen (QL 1178) produced a finite date of $29\,700 \pm 240$ yr BP. Hare coprolites (QL 1213), composed entirely of vegetation, rendered a date of $14\,500 \pm 300$ yr BP.

TAXONOMY

Eleven of the 18 animals recovered from Jack Wade Creek

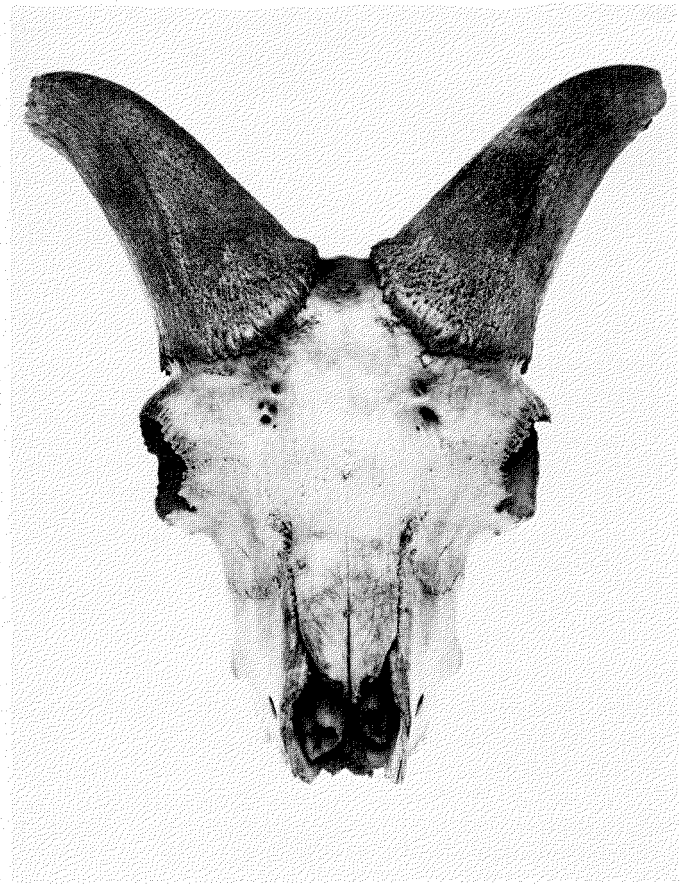


FIG 3. Anterior view of complete cranium of a fossil Dall Sheep (*Ovis dalli* Nelson; USNM 262462).

were Dall sheep, constituting more than 60% of the vertebrate fauna. Sheep usually compose less than 5% of the total Late Pleistocene mammalian taxa from northern sites (Guthrie, 1968; Harington, 1978). The large number of mountain sheep at Jack Wade probably is related to the site's elevation (740 m) and to the availability of upslope terrain. The remaining 3 bison, 2 caribou, 1 horse and 1 moose reflect normal distributions of taxa for Alaskan Pleistocene faunas.

The Jack Wade fossil fauna is significant because it is an inferred *in situ* Alaskan Pleistocene fauna. The assemblage is composed entirely of big-game genera, and of these more than 60% are Dall sheep. The fossil elements recovered are largely restricted to the forelimbs and crania of ungulates: 9 sheep crania, 2 bison crania, 2 caribou crania, 5 bison humeri, 1 equid humerus, 1 equid atlas vertebra and 1 equid scapula. The hindquarters of each genus at the site are missing. Porter and Hopkins (1982) have argued elsewhere the case for human involvement with the Jack Wade fossil fauna.

POLLEN ANALYSIS

Fossil pollen associated with the vertebrate assemblage at Jack Wade Creek is shown in Figure 4. The pollen assemblage is representative of an open, sedge-dominated plant community with scattered spruce and birch and very few alders, for which there is no living analogue (Lichti-Federovich, 1973; Matthews, 1974, 1982). Some grass, although not necessarily abundant or nutritious, probably existed near the site almost 30 000 years

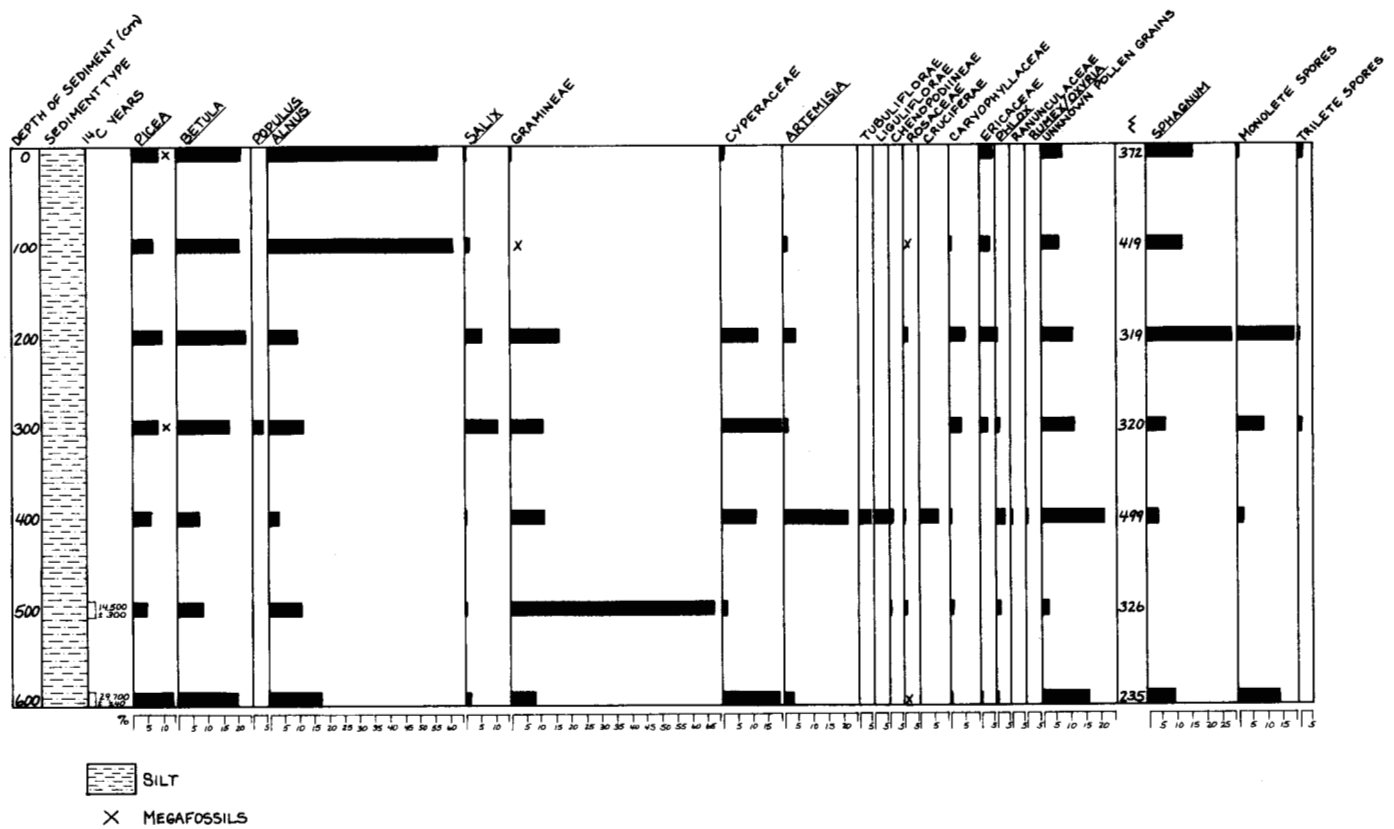


FIG 4. Pollen bar graph for Jack Wade section.

ago, as suggested by the strong preference for grass in the diets of modern sheep, bison and horses (Martin, 1982).

SUMMARY AND CONCLUSIONS

Sixty fossil bones representing 18 Beringian mammals have been recovered near Jack Wade, Alaska, from an inferred *in situ* Late Pleistocene deposit. The inferred biocenose is composed of 11 *Ovis dalli* Nelson (Dall sheep), 3 *Bison priscus* [Bojanus] (Steppe Bison), 2 *Rangifer tarandus* [Linnaeus] (caribou), 1 *Equus (Asinus) lambei* Hay (Yukon Wild Ass) and 1 *Alces alces* Linnaeus (moose) (see Systematics). Radiocarbon analysis of bison horn core collagen (QL 1178, 29 700 ± 240 yr BP) suggests that the assemblage is approximately 30 000 years old.

The Jack Wade fossil fauna is one of a small and significant number of stratigraphically controlled Beringian localities.

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Several specialists contributed outright to this work: R.E. Nelson identified the fossil pollen from hare coprolites, feces and matrices; L.C. Cywnar identified the fossil pollen from Sample 4; W.A. Watts identified plant macrofossils; and A.V. Morgan identified the insect macrofossils. Minze Stuiver contributed the radiocarbon analyses. Jerry McCollum photographed the specimens and Patricia Broyles prepared the manuscript.

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