A Late Pleistocene Antler Artifact from the Klondike District, Yukon Territory, Canada

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ABSTRACT. A modified caribou antler, interpreted as a flintknapper’s punch, was collected with hundreds of other Pleistocene mammal bones at Hunker Creek near Dawson City, Yukon Territory. It has yielded a radiocarbon date of 11 350 ± 110 B.P. by accelerator mass spectrometry (AMS). Although the specimen was not found in stratigraphic context, we infer its probable burial history from its radiocarbon age and surface alteration, and its artifactual nature from the way it has been modified. Since it is contemporaneous with Alaskan and Yukon sites containing core and blade technology, the punch may have been used for indirect percussion flaking of stone tools and preforms.

Key words: caribou, Rangifer tarandus, Yukon Territory, late Pleistocene, bone tool

INTRODUCTION

Among ice age vertebrate localities in Canada, those in unglaciated parts of the Yukon Territory are most productive of fossils. Pleistocene mammal bones have been reported near Dawson City (Fig. 1, no. 7) since the turn of the century (e.g., Dawson, 1901; Whiteaves, 1903; Obalski, 1904; Lambe, 1905; Osgood, 1905a,b). Since 1966, the Canadian Museum of Nature (formerly the National Museum of Natural Sciences) has been carrying out a long-term program of collecting and studying Pleistocene vertebrate remains from the Yukon. The objectives of this program include the taxonomy, origins, chronology and paleoecology of animals that have lived there during the latter half of the last glaciation, between about 30 000 and 15 000 years ago (Harington, 1989).

On 15 August 1973, while collecting Pleistocene mammal bones at the placer-mining operation of John Erickson and Herman Liedtke, on Hunker Creek (Dawson Locality 16; Fig. 1, no. 8; 63°55’N, 138°52’W), the first author noticed a large bullet-shaped piece of caribou antler (Fig. 2). It appeared to have been purposely shaped for use as a punch, and it was showing localities of sites and cities mentioned in the text. Alaska: 1, Broken Mammoth; 2, Dry Creek; 3, Fairbanks; 4, Moose Creek; 5, Walker Road. Yukon: 6, Bluefish Caves; 7, Dawson City; 8, Hunker Creek; 9, KBTx-2.

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acceded by the Archaeological Survey of Canada, Canadian Museum of Civilization (formerly National Museum of Man), where it is catalogued as KlVi-1:1. Preliminary remarks on the specimen are in Harington (1975, 1977, 1989), Harington et al. (1975), and Bonnichsen (1979).

From a stratigraphic viewpoint, a great thickness of “muck” (miner’s term for loess or reworked loess containing organic matter) overlay the gold-bearing gravel on the downstream side of the excavation. Erickson said that most of the bones had come from the interface of the muck and gravel, but that, rarely, bones were found higher up in the muck. This supports earlier observations (Harington and Clulow, 1973; Harington, 1987:Fig. 33). Although the stratigraphic position of the Hunker Creek antler tool was not documented, we can infer from its radiocarbon age (see below) that it probably came from a position near the interface of the muck and the peat unit that commonly overlies it in this and many other parts of the Yukon (e.g., Hunter and Langston, 1965:Fig. 1; Harington, 1977:Fig. 5).

DESCRIPTION OF THE TOOL

The specimen was compared with a series of antlers in the Canadian Museum of Nature collections. Based on its size, shape and cortical thickness, it is part of a caribou (Rangifer tarandus) antler and probably was derived from the main beam of an adult male just above the bez tine (Fig. 3A). Unfortunately, we cannot reconstruct in detail a sequence of manufacturing steps or other modifying processes that led to the production of the specimen, because the entire surface has been altered by some kind of chemical or physical attack. As a result, the surface is slightly but uniformly pitted (e.g.,

Bonitichsen, 1979:29-30, Plate III-4a; Bromage, 1984:Fig. 4), and any tool marks or other surface traces that might have reflected a production process have been removed. However, we can suggest a general series of actions that would be needed to achieve the gross morphology of the specimen.

The antler is nearly flat at one end and bluntly pointed at the other (Fig. 3B). The flatter end, or butt, is slightly keeled, sloping downward and outward about 5-10° from the horizontal, with cortical tissue as smooth as the sides of the antler. The sides taper gradually to a blunt point that terminates in the cortical tissue to one side of the spongy medulla. The asymmetrical position of the medulla can also been seen on the butt (Fig. 3C). The specimen has a total length of 128.3 mm, and the butt varies in diameter from 35.6 to 37.6 mm. A scar on one side, measuring 30.2 mm long and 11.7 mm wide, has been formed by detachment of a flake from an impact on the edge of the butt. The flake scar terminates in a small hinge fracture. The only other observable surface features are the buff colour and some small desiccation cracks.

We have considered several processes that might account for the morphology of this specimen: 1) intraspecific aggression, 2) fluvial transport, and 3) artifact manufacture. Intraspecific aggression occasionally fractures antlers, but fresh antlers do not fracture with smooth, slightly keeled transverse surfaces, as seen on the butt of this specimen. Desiccated antlers may fracture transversely, but the fracture surfaces are very rough, with the spongy medulla in a different plane from the cortical tissue. One of the desiccation cracks on this
material was removed to a depth of about 2 mm, using an elec-
penetration, leaching, humus, etc. The sample was removed
from the side opposite the flake scar. Since the specimen had
traces of plasticine or wax left on the surface (although none
been cast using a silicon rubber mould, there might have been
resulting antler powder cleared away. Then a 2.2 g sample was
removed from the interior by drilling two 8 mm diameter
holes to depths of about 15 mm each. Clean drill bits were
used for each operation (Canadian Museum of Nature,
Paleobiology Division Conservation Files). The sample was

Chemical pretreatment and AMS target preparation were
performed at Beta Analytic Inc. in Coral Gables, Florida. The
sample was physically cleaned, then crushed and placed in
dilute, cold acid that gradually dissolved the mineral portion
of the antler sample. The remaining collagen fraction was
combusted and the carbon dioxide purified and reacted with
hydrogen on iron catalysts to produce graphite. The graphite
was applied to copper targets, which were sent to Eidgen-
ossische Technische Hochschule (ETH) in Zurich, Switzer-
land, for triplicate AMS measurements (M. Tamers, pers.
comm. 1989).

The resulting date is 11 350 ± 110 B.P. (Beta-27512 ETH-
4582). This date has been adjusted for total \(^{13}C\) fractionation
effects resulting from natural processes and laboratory proce-
dures. The \(^{13}C\) contents were measured concurrently with \(^{14}C\).
This date indicates that people were present in what is now the
Dawson area of the Yukon near the close of the last glaciation.

DISCUSSION

When this punch was first recognized in 1973, it repre-
sented an intriguing but isolated find that could not easily be
related to the existing body of archaeological evidence in
Alaska and Yukon. During the past two decades, that body of
evidence has grown considerably, with new discoveries at
many sites in this region. In particular, we note the accumulat-
ing evidence for late Pleistocene blade and microblade tech-
nology at several sites in central Alaska (Powers and Hoffecker,
1989; Powers et al., 1990; Goebel et al., 1991), Bluefish
Caves in northern Yukon (Cinq-Mars, 1990) and site KbTx-2
in south-central Yukon (Clark, in press). This evidence sug-
ests a sensible context for an antler punch that could have
been used for indirect percussion flaking (see Crabtree,
1972:88). The radiocarbon date on the Hunker Creek punch
fits within the span of the Nenana complex (11 000 to 12 000
B.P.), characterized both by core and blade and by core and
flake technology (Goebel et al., 1991). Except for the recently
discovered Broken Mammoth site (Yesner, 1991), most of the
Nenana complex sites, such as Dry Creek, Moose Creek
and Walker Road (Fig. 1), contain very little preserved organic
material, and the Hunker Creek punch may well provide our
first glimpse of the non-lithic tool kit with which stone tools
were made.

Other intriguing, isolated finds of both stone and bone arti-
facts were reported from Pleistocene muck deposits in the
Fairbanks, Alaska, area more than a half century ago (Rainey,
1939, 1940). Unless they have been contaminated by preserva-
tives, the bone artifacts should be restudied and sampled for
AMS dating, and the stone tools should be examined for dat-
able residues.

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and Jerry Fitzgerald (Paleobiology, Canadian Museum of Nature)
assisted the first author in collecting the radiocarbon sample. We

DATING

Scores of well-preserved specimens (Fig. 2) were collected
from this locality at about the same time as the artifact, includ-
ing steppe or long-horned bison (Bison priscus), woolly mam-
moth (Mammuthus primigenius), small Yukon horse (Equus
lambei), caribou (Rangifer tarandus) and rarer forms such as
helmeted muskox (Symbos cavifrons), American lion (Pan-
thera leo atrox) and wolf (Canis lupus). In general appear-
ance, the caribou antler artifact looks similar to bones of
extinct animals with which it was found, and the first author
suspected that it was more than 15 000 years old (Harington,
1975). This view was influenced by a radiocarbon analysis of
another caribou antler specimen from the same collection that
yielded a date of 23 900 ± 470 B.P. (I-8580). The artifact
could not be dated at that time without sacrificing it entirely,
but the new method of AMS dating, requiring only a few
grams of sample material, has afforded an opportunity to
determine the age of the specimen.

The artifact was sampled for AMS dating on 4 August
1988. There was no evidence of contamination due to root
penetration, leaching, humus, etc. The sample was removed
from the side opposite the flake scar. Since the specimen had
been cast using a silicon rubber mould, there might have been
traces of plasticine or wax left on the surface (although none
was visible in the sampling area). As a precaution, surface
material was removed to a depth of about 2 mm, using an elec-
tric drill. Two spots about 20 mm apart were drilled and the
resulting antler powder cleared away. Then a 2.2 g sample was
removed from the interior by drilling two 8 mm diameter
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