



LAS September 2016 Headlines:

ICE AGE BISON FOSSILS SHED LIGHT ON EARLY HUMAN MIGRATIONS IN NORTH AMERICA

Heritage Daily, UNIVERSITY OF CALIFORNIA – SANTA CRUZ

Scientists using evidence from bison fossils have determined when an ice-free corridor opened up along the Rocky Mountains during the late Pleistocene.

The researchers combined radiocarbon dating and DNA analysis to track the movements of bison into the corridor, showing that it was fully open by about 13,000 years ago. Their findings, published June 6 in ***Proceedings of the National Academy of Sciences***, indicate that the corridor could not account for the initial dispersal of humans south of the ice sheets, but could have been used for later movements of people and animals, both northward and southward.

In the 1970s, geological studies suggested that the corridor might have been the pathway for the first movement of humans southward from Alaska to colonize the rest of the Americas. More recent evidence, however, indicated that the Cordilleran and Laurentide ice sheets coalesced at the height of the last ice age,

around 21,000 years ago, closing the corridor much earlier than any evidence of humans south of the ice sheets. The initial southward movement of people into the Americas more than 15,000 years ago now seems likely to have been via a Pacific coastal route, but the Rocky Mountains corridor has remained of interest as a potential route for later migrations.

“The opening of the corridor provided new opportunities for migration and the exchange of ideas between people living north and south of the ice sheets,” said first author Peter Heintzman, a postdoctoral researcher at UC Santa Cruz who led the DNA analysis.

Previous work by coauthor Beth Shapiro, professor of ecology and evolutionary biology at UC Santa Cruz, had shown that the bison populations north and south of the ice sheets were genetically distinct by the time the corridor opened. By analyzing bison fossils from within the corridor region, the researchers were able to track the movement of northern bison southward into the corridor and southern bison northward.

“The radiocarbon dates told us how old the fossils were, but the key thing was the genetic

analysis, because that told us when bison from the northern and southern populations were able to meet within the corridor,” Heintzman said.

The results showed that the southern part of the corridor opened first, allowing southern bison to start moving northward as early as 13,400 years ago, before the corridor fully opened. Later, there was some movement of northern bison southward, with the two populations overlapping in the corridor by 13,000 years ago.



The corridor has been considered a potential route for human and animal migrations between the far north (Alaska and Yukon) and the rest of North America, but when and how it was used has long been uncertain. The steppe bison had much larger horns than modern bison. Radiocarbon dating and DNA analysis of bison fossils enabled researchers to track the migration of Pleistocene steppe bison into an ice-free corridor that opened along the Rocky Mountains about 13,000 years ago. CREDIT Government of Yukon



Loveland Archaeological Society, Inc.

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“Bison fossils are the most widespread Quaternary mammal in western North America and of interest because they survived the extinctions at the end of the Pleistocene, unlike most other North American large mammals,” said coauthor Duane Froese of the University of Alberta. “We were able to sample bison fossils, largely from museum collections, including critical ones from central Alberta that dated to the initial opening of the corridor.”

According to Shapiro, archeological evidence suggests that human migration within the corridor was mostly from south to north. Sites associated with the Clovis hunting culture and its distinctive fluted point technology were widespread south of the corridor around 13,000 years ago and decline in abundance from south to north within the corridor region. A Clovis site in Alaska has been dated to no earlier than 12,400 years ago.

“When the corridor opened, people were already living south of there. And because those people were bison hunters, we can assume they would have followed the bison as they moved north into the corridor,” Shapiro said.

The steppe bison of the Pleistocene (*Bison priscus*) were much bigger than modern bison (*Bison bison*), she said. Before the corridor closed, prior to the last glacial maximum, they moved freely up and down between the ice-free regions in the north and grasslands south of the ice sheets. After the ice sheets coalesced, the population that was cut off to the south contracted, leaving one genetically distinct southern lineage.

The DNA analysis used in this study focused on mitochondrial DNA, which is easier to recover from fossils than the DNA in chromosomes, because each cell has thousands of copies of the relatively short mitochondrial DNA sequence. While Shapiro’s lab led the DNA analyses, Froese’s lab led the radiocarbon dating work.

Many of the fossils they analyzed came from collections at the Royal Alberta Museum in Edmonton and other institutions. “Thousands of steppe bison fossils are recovered in northern Canada every year,” said coauthor Grant Zazula of the Government of Yukon Palaeontology Program in Whitehorse. “Most of these fossils are uncovered by mining or gravel pit operators and later made available to scientists for study. These results speak to the importance of collecting and preserving fossils in order to better understand our history.”

Volunteers Needed!

It’s that time again, and we’re looking for members who are interested in volunteering to help with this year’s Loveland Stone Age Fair. We’re looking for help with the following duties:

- Security
- Photographer
- Emcee
- Door Prize / Raffle Table
- Front Table Greeter
- Artifact Identification Table
- Refreshment Table / Sales (Hats/T-Shirts)
- Additional Exhibitors for Sunday

If interested, please call or email Kevin Zeeck (303-682-0471 / kkzeeck@gmail.com). Your help is greatly appreciated!

Let’s make this another great Stone Age Fair!



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LAS Find of the Month, September 2016:

Members can bring an artifact to be entered into the competition at the monthly meeting, which will be judged based on the following rules:

1. Must be a member of LAS in good standing.
2. The artifact must be a personal find.
3. It must have been found within the specified time frame, i.e., within the month prior to the meeting.
4. The artifact doesn't have to be a Colorado find—all that matters is that it was found in the last month.

The Find of the Month for September was made by Tom Dubovos.

Type: Angostura
Material: Translucent Dendritic Agate
Location: S. Platte River
Morgan County, Colorado



LAS News and Upcoming Events:

- September 24 & 25, 2016 2015 Loveland Stone Age Fair. More information will be provided in the September newsletter. Speakers for the 2016 Loveland Stone Age Fair will be Dr. Jason LaBelle and Jeb Taylor. Put the dates on your calendar, and plan now to attend!
- October 4, 2016 October meeting. Program: Jim and Joyce Mountain will give a presentation on the Cahokia Mound and the Collinsville Artifact Show.
- November 1, 2016 November meeting. This will be our annual Native American Foods program. We will be taking donations in the form of gifts, gift cards, or money to provide a Christmas for Native American families in the area. More information will be included in the October 2016 newsletter.

Speakers Needed!

Really!! We need speakers for our 2017 meetings! If you would like to give a presentation or know of someone who would give a great program please contact Andy Coca, Jean Steinhoff or Kevin Zeeck. No experience is necessary, just a passion for our hobby and a willingness to share that passion. Thanks!