

February 27, 2023

News and notes

Before going on to a look at mammals [from North America](#) during the [Pleistocene Epoch](#), here are some news items that I thought were interesting.

Research

- [Poleward amplification, seasonal rainfall and forest heterogeneity in the Miocene of the eastern USA](#); behind a pay wall, Phys.org summary [here](#).
- Geochronology and carbon cycle research: [Berriasian–Valanginian Geochronology and Carbon-Isotope Stratigraphy of the Yellow Cat Member, Cedar Mountain Formation, Eastern Utah, USA](#); Phys.org summary [here](#).
- More geochronology: [Dating mylonitic overprinting of ancient rocks](#).
- [Impact origin of the “Domaine du Meteorite”-crater, France. Compelling mineralogical and geophysical evidence for an unrecognized destructive event in the heart of Europe](#); Eureka Alert summary [here](#).
- Geochemistry and sedimentology: [Syn depositional Uptake of Uranium, Molybdenum and Vanadium into Modern Bahamian Carbonate Sediments during Early Diagenesis](#).

Paleontology

- [Global impact and selectivity of the Cretaceous-Paleogene mass extinction among sharks, skates, and rays](#); Eureka Alert summary [here](#).
- Fossil fish: [A high latitude Gondwanan species of the Late Devonian tristichopterid *Hyneria* \(*Osteichthyes: Sarcopterygii*\)](#); Eureka Alert summary [here](#).
- Brachiopods: [A new species of *Hirnantia* \(Orthida, Brachiopoda\) and its implications for the Hirnantian age of the Ellis Bay Formation, Anticosti Island, eastern Canada](#).
- [Eurypterids from the Price Formation of Virginia: First Eurypterids from the Mississippian of North America](#).
- Interpreting fossils: [Is the middle Cambrian *Brooksella* a hexactinellid sponge, trace fossil or pseudofossil?](#) Phys.org summary [here](#).
- Dinosaur brains: [Modified skulls but conservative brains? The palaeoneurology and endocranial anatomy of baryonychine dinosaurs \(Theropoda: Spinosauridae\)](#); Phys.org summary [here](#).
- Glow in the dark sharks: [Illuminating the evolution of bioluminescence in sharks](#).

Glaciation and Climate Change

- Periglacial environment: [The thermal response of permafrost to coastal floodplain flooding](#).
- [Plio-Pleistocene deep-sea ventilation in the eastern Pacific and potential linkages with Northern Hemisphere glaciation](#); Phys.org summary [here](#).
- Antarctic ice: [Fast Ice Thickness Distribution in the Western Ross Sea in Late Spring](#); Phys.org summary [here](#).
- Ancient glaciations, and sedimentology research: [Sedimentary facies and carbon isotopes of the Upper Carboniferous to Lower Permian in South China: Implications for icehouse to greenhouse transition](#); Phys.org summary [here](#).
- Short (2.48 minutes) glacial geology talk from Prairie Public: [Geology of Turtle Mountain and Missouri Coteau](#).

Environmental Geology and Hydrogeology

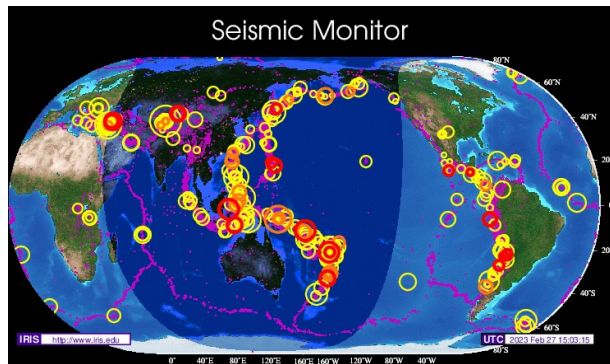
- [Will Utah's Great Salt Lake disappear?](#)
- Heavy metals: [Silicon-mediated alleviation of cadmium toxicity in soil-plant system: historical review](#).
- More heavy metals: [Emerging mercury and methylmercury contamination from new artisanal and small-scale gold mining along the Nile Valley, Egypt](#).
- [Ohio train derailment: Chemicals that 'may be of health concern' found in East Palestine](#).

Mining and Energy

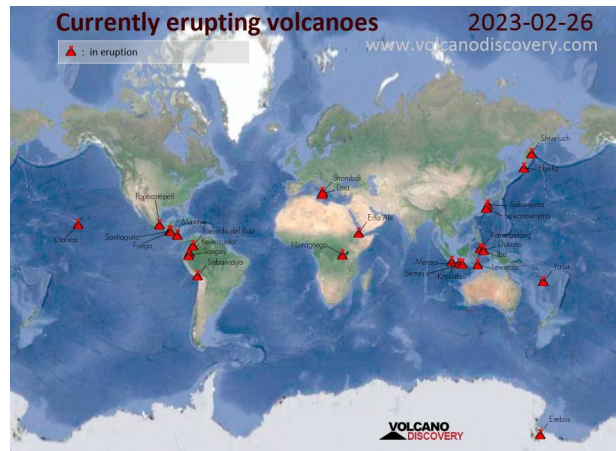
- Geology of ore deposits: [Mineral Texture Classification Using Deep Convolutional Neural Networks: An Application to Zircons From Porphyry Copper Deposits](#); Phys.org summary [here](#).
- Geophysics and the geology of ore deposits: [P-wave velocity structure and implications for magmatism and metallogenesis in the southern Altai: Constraint from wide-angle seismic data along the Altai-Eastern Tianshan traverse](#).
- [Mineralogy, Geochemistry and Fluid Inclusion Study of the Stibnite Vein-Type Mineralization at Rizana, Northern Greece](#).
- There's gold in them thar tailings: [An underexploited invisible gold resource in the Archean sulphides of the Witwatersrand tailings dumps](#).
- [Diavik Diamond Mine's Life Extended Until 2026](#).
- [Lithium producers defy mining sector slump with surging profits](#).
- [Beijing probes illegal mining activities in Chinese lithium hub](#).
- New gold mine: [Treasury Metals aims for 2026 mining start near Dryden](#).

- [China's Coal Plant Approvals Surged To A 7-Year High In 2022.](#)
- Hydrocarbon exploration activity: [U.S. drillers cut the most oil and gas rigs in a month since June 2020 – Baker Hughes.](#)
- From the United States Energy Information Administration: [Domestic policy and geopolitics reduced China's refinery activity in 2022.](#)
- Whoops: [Three Fires At Pemex Facilities In One Day.](#)
- [China Secures Two Long-Term LNG Deals With U.S. Producer.](#)

Volcanoes, Earthquakes and Geohazards



[Seismic Monitor](#)



[Currently Erupting Volcanoes](#)

- [Mexico's Popocatepetl Volcano Erupts and Shoots Lava into Sky.](#)
- United States Geological Survey (USGS) [Volcano Updates.](#)
- [USGS Magnitude 2.5+ Earthquakes, Past Day.](#)
- Earthquakes and geophysics: [Weak upper-mantle base revealed by postseismic deformation of a deep earthquake](#); Phys.org summary [here](#).
- Flooding and fluvial geology: [Human disturbances dominated the unprecedentedly high frequency of Yellow River flood over the last millennium](#); Phys.org summary [here](#).
- [These Tsunami Detectives Search for Ancient Disasters.](#)

Pretty Rocks

- [An Extraordinarily Large Cat's-Eye Emerald.](#)

February 27, 2023

Pleistocene Mammals of The Nearctic Eco-zone, North America

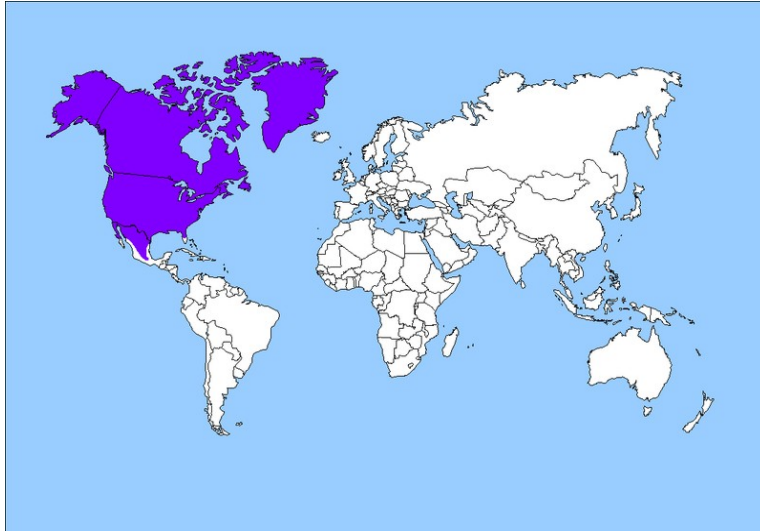


Figure 1 – The Nearctic Eco-zone

Credit: MPE, [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

The [Nearctic Eco-zone](#) covers most of North America, including Greenland, Central Florida, and the highlands of Mexico, as shown in Figure 1. A wide variety of interesting animals lived in the Nearctic Eco-zone during the [Pleistocene Epoch](#). In this and next week's posting we'll look at some of the mammals that lived in North America during that time, especially those that went extinct. In three weeks we'll take a look at some other animals that lived in North America at that time.

During the Pleistocene, much of the northern hemisphere was covered by [continental glaciations](#), as shown in Figure 2. However, plenty of animals lived in the unglaciated parts of the continent.

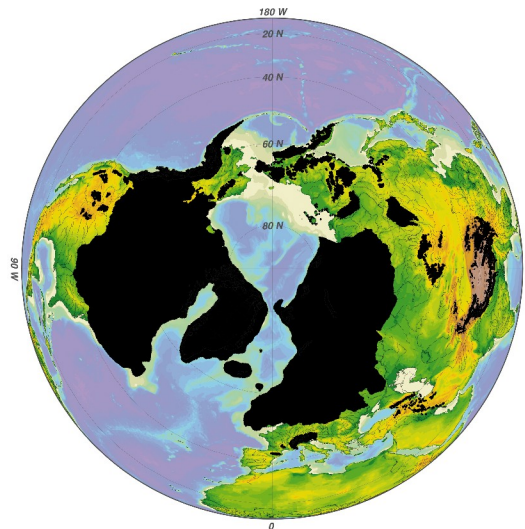


Figure 2 – Maximum Glaciation of the Northern Hemisphere (black) during the Pleistocene
Credit: Hannes Grobe/AWI, [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

Stockoceros, A Pronghorn



Figure 3 – *Stockoceros conklingi* at the [Natural History Museum of Los Angeles County](#)
Credit: [Jonathan Chen](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license

Pronghorns, or [Antilocapridae](#), are a group of [Artiodactyls](#) that are confined to North America. They are distantly related to [giraffes](#), from which [pronghorns diverged](#) during the [Early Miocene](#). While formerly comprising dozens of species, Antilocapridae is currently represented by a single species, the Common Pronghorn, [Antilocapra americana](#). One of the pronghorns that lived during the Pleistocene, and is no longer with us, was the genus [Stockoceros](#).



Figure 4 – *Stockoceros* life restoration
Credit: [Benji Paysnoe](#), [public domain](#)

Stockoceros lived in northern Mexico and the southwest United States (Arizona, California, New Mexico, Texas). It lived on open grasslands and its diet was a mix of [grazing](#) and [browsing](#). It had two horns, each of which were in turn divided into two prongs of equal length. Like most pronghorns, *Stockoceros*, seems to have built for speed, avoiding predators by out running them. Among the predators thought to hunt pronghorns was the [American cheetah](#).

Stockoceros was [first described in 1942](#) by the American paleontologist [Morris Skinner](#) based upon fossils he found at [Papago Springs Cave](#) in Arizona. There are two species in the genus *Stockoceros*: *S. conklingi*, first discovered by [Chester Stock](#) in 1930 from fossils recovered from the [Rancho La Brea](#) tar pits; and *S. onusrosagris*, [first discovered](#) by [Quentin Roosevelt](#) and [J. W. Burden](#) in 1934 from fossils at Papago Springs Cave. Interestingly, Roosevelt was 14 years old when he worked with Burden.

Bison latifrons

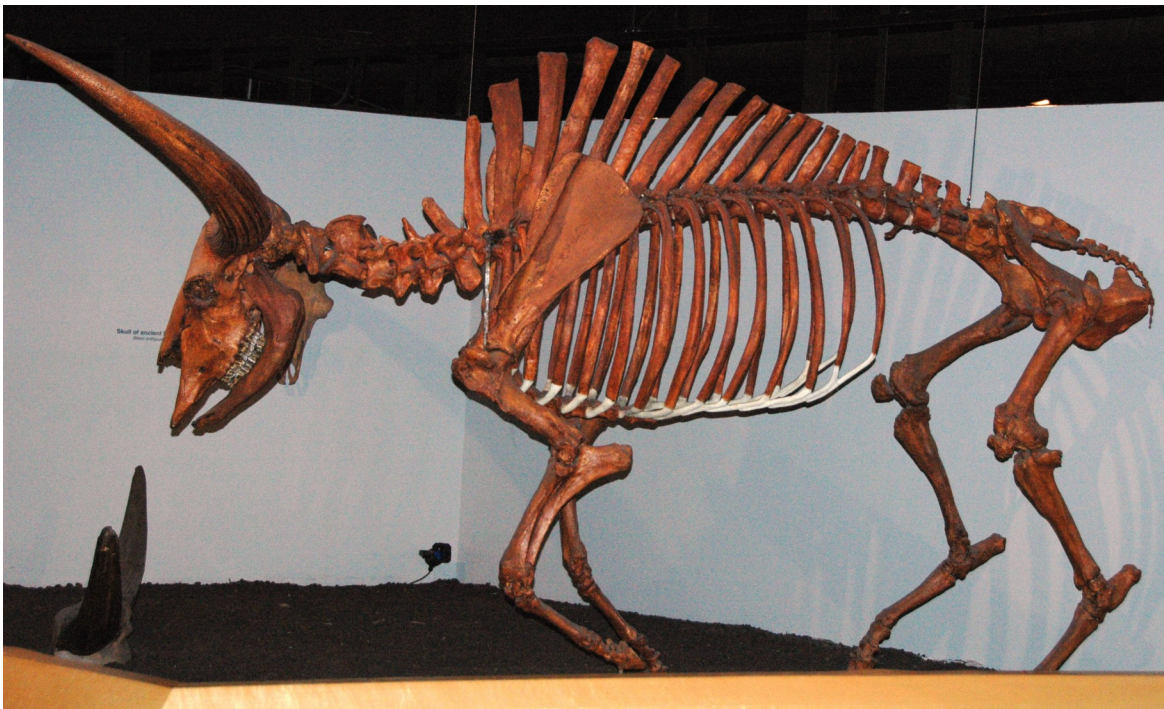


Figure 5 – Skeleton of *Bison latifrons* at [Museum of Natural History & Science, Cincinnati, Ohio](#)
Credit: [James St. John](#), [Creative Commons Attribution 2.0 Generic](#) license

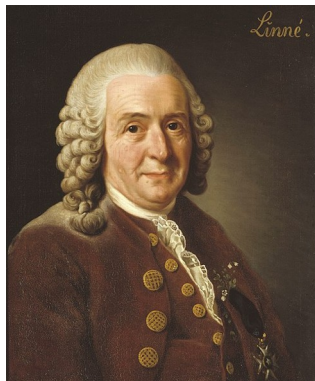
An ancient variety of American buffalo, *Bison latifrons* lived from the late [Pliocene](#) into the Pleistocene, becoming extinct during the Last Glacial Maximum 26,000 to 20,000 years before present (BP). Also called the long-horned bison, researchers believe that *Bison latifrons* evolved from an earlier bison, *Bison priscus* that [migrated from Eurasia about 195,000 to 135,000 BP](#). *Bison latifrons* did not disappear without issue and is thought to have evolved into *Bison antiquus* which in turn [evolved](#) into modern North American bison, *Bison bison*.

The long-horned bison was pretty big, possibly the biggest bovid ever to live in North America. Fossil [evidence suggests](#) that *Bison latifrons* were about 4.75 m long, 2.5 m tall and weighed about 2000 kg. In keeping with its nickname, *Bison latifrons* had big horns that measured as much as 213 cm from tip to tip, compared with 66 to 90 cm in modern *Bison bison*.

[Fossils of *Bison latifrons*](#) come from Pleistocene deposits in Alberta and Saskatchewan in Canada as well as Pleistocene deposits in California, Colorado, Florida, Idaho, Kansas, Montana, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Utah in the United States. The earliest fossils of long-horned bison came from Pliocene deposits in Mexico.



Figure 6 - *Bison latifrons* reconstruction
Credit: [Quedxal](#), CC-BY-SA



American paleontologist [Richard Harlan](#) was the [first to describe fossils](#) of *Bison latifrons* in 1825. The genus *Bison* was first described by Swedish naturalist [Carl Linnaeus](#) in 1758 in the 10th edition of his [Systema Naturae](#). There are two living species of the genus *Bison* and 12 extinct species.

Figure 7 – Carl Linnaeus in the [National Portrait Gallery of Sweden](#)
Credit: [Alexander Roslin](#), public domain

Columbian Mammoth – *Mammuthus columbi*

Found in fossils from the famous [La Brea Tar Pits](#), *Mammuthus columbi*, or the [Columbian Mammoth](#) lived during the Pleistocene of North America and died out during the [Quaternary Extinction Event](#). Researchers [have recovered fossils of *Mammuthus columbi*](#) from Pleistocene deposits in Canada (Alberta, British Columbia, and Saskatchewan), El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and the United States (Alabama, Arizona, Arkansas, California, Florida, Georgia, Idaho, Kansas, Maryland, Minnesota, Montana, Nebraska, New Mexico, Oklahoma, Oregon, South Carolina, South Dakota, Texas, Utah, Virginia, Washington, and Wyoming). The earliest fossils of *Mammuthus columbi* came from

Neogene deposits in Nicaragua. The closest living relative of the Columbian Mammoth is the Asian Elephant, [*Elephas maximus*](#).



Figure 9 – *Mammuthus columbi* skeleton at the Page Museum of the [La Brea Tar Pits](#)
Credit: [Jonathan Chen](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license

A herbivore, *Mammuthus columbi* was huge, about 4 m tall at the shoulder and weighing about 10 tonnes. It needed about 400 kg a day of plant food, grass and leaves. That's a lot of salad. Incredible as it may seem, people hunted these big brutes, as shown by the [remains of tools](#) left among the bones of butchered mammoths.

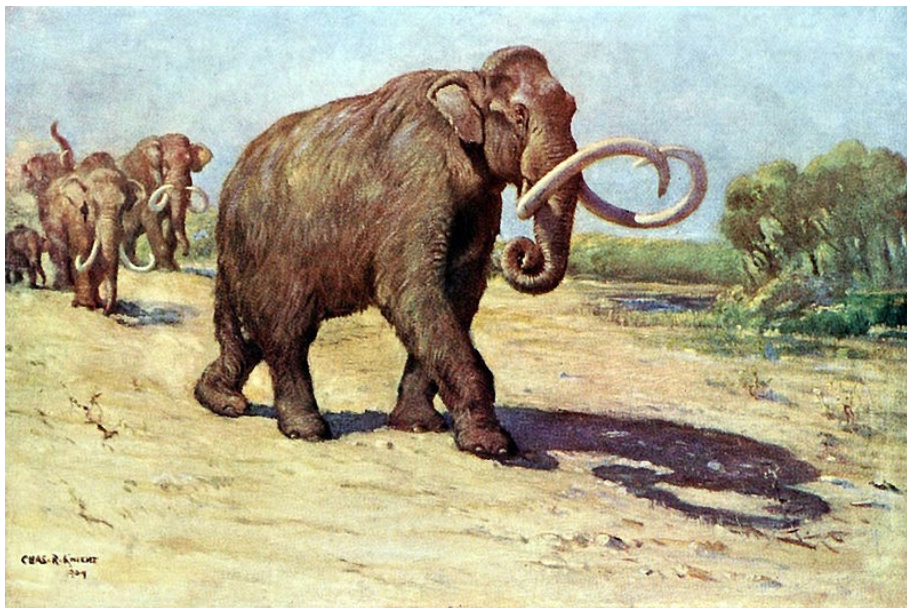


Figure 9 – Columbian mammoth
Credit: [Charles R. Knight](#), [public domain](#)

Scottish geologist [Hugh Falconer](#) was the [first to describe](#) *Mammuthus columbi* in 1857 from fossils recovered during the excavation of the Brunswick–Altamaha Canal in Georgia, USA. British anatomist and naturalist [Joshua Brookes](#) first [described](#) the genus *Mammuthus* in 1828. The genus contains 10 species, all now extinct.

Or is it? At least [one company](#) wants bring back the mammoth, using DNA recovered from frozen [woolly mammoths](#) and modern elephants. Some people are [skeptical of this project](#), but it would certainly be interesting if it succeeded.

Wrapping it Up

We'll leave it there for this week. Next week we'll look at some more mammals from the Pleistocene of North America, focusing on carnivores.

Standard Caveat

The purpose of my weblog postings is to spark people's curiosity in geology. Don't entirely believe me until you've done your own research and checked the evidence. If I have sparked your curiosity in the subject of this posting, follow up with some of the links provided here. If you want to, go out into the field and examine some rocks on your own with the help of a good field guide. Follow the evidence and make up your own mind.

In science, the only authority is the evidence.