

September 19, 2022

News and notes

Before going on to show some more neat fossils of mammals that lived in the [Paleogene Period](#), here are some news items that I thought were interesting.

General Science

- The Ig Nobel Awards were given this last week: here is the [link to the video of the ceremony](#); here is a summary on [Ars Technica](#).
- Fake conferences: [The Alarming Rise of Predatory Conferences](#).

Research

- Geophysics: [Kalmag: a high spatio-temporal model of the geomagnetic field](#).
- Plate tectonics, establishing the original location of an ancient rock : [Orienting paleomagnetic drill cores using a portable GPS compass](#).
- More plate tectonics: [Don't judge an orogen by its cover: Kinematics of the Appalachian décollement from seismic anisotropy](#).
- Climate research: [The Sun's role in decadal climate predictability in the North Atlantic](#).
- Connections: [Feedbacks between sea-floor spreading, trade winds and precipitation in the Southern Red Sea](#).
- [Mysterious diamonds came from outer space, scientists say](#).
- Stable isotope research: [U–Pb Geochronology and Stable Isotope Geochemistry of Terrestrial Carbonates, Lower Cretaceous Cedar Mountain Formation, Utah: Implications for Synchronicity of Terrestrial and Marine Carbon Isotope Excursions](#).

Paleontology

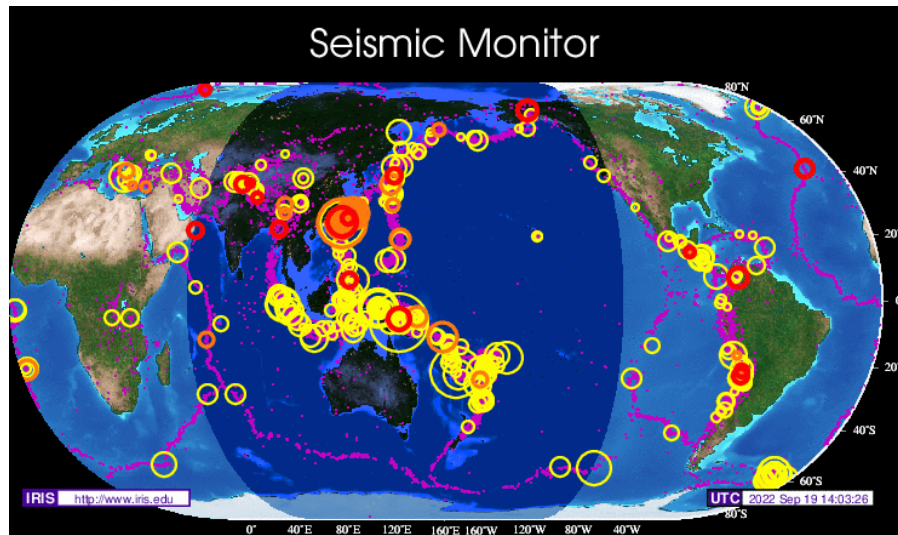


Fossilized Heart from Gogo lagerstätte
[Credit: Phys.org](#)

- [Exceptional preservation of organs in Devonian placoderms from the Gogo lagerstätte; behind paywall](#), Phys.org summary [here](#).

- [A nearly complete skeleton of a new eusphenodontian from the Upper Jurassic Morrison Formation, Wyoming, USA, provides insight into the evolution and diversity of Rhynchocephalia \(Reptilia: Lepidosauria\)](#); Eureka Alert summary [here](#).
- Insects in amber: [A case of frozen behaviour: A flat wasp female with a beetle larva in its grasp in 100-million-year-old amber](#).
- [Prehistoric Puke Reveals a Stomach-Churning Banquet From Millions of Years Ago](#).

Volcanoes, Earthquakes and Geohazards



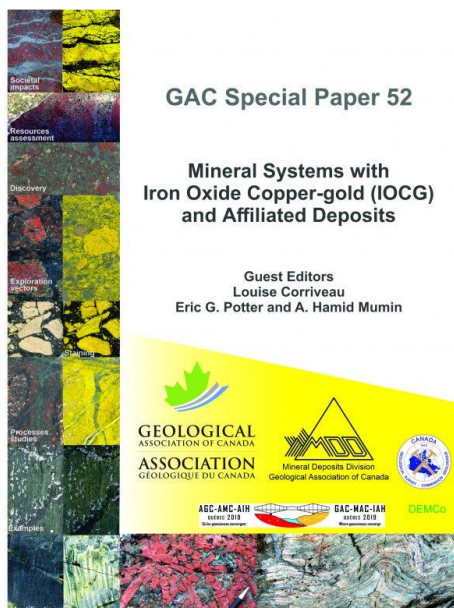
[Seismic Monitor Link](http://www.iris.edu)

- Landslide studies: [Landslide length, width, and aspect ratio: path-dependent measurement and a revisit of nomenclature](#); behind a paywall, Phys.org summary [here](#).
- Avalanche research: [Data-driven automated predictions of the avalanche danger level for dry-snow conditions in Switzerland](#).
- Mineralogy of deep earthquakes: [In situ X-ray and acoustic observations of deep seismic faulting upon phase transitions in olivine](#); Phys.org summary [here](#).
- From Lawrence Berkeley National Laboratory: [Cracking the secrets to earthquake safety, one shake simulation at a time](#).
- [M 6.5 Earthquake on the Eastern Coast of Taiwan](#).
- [Earthquake News and Global Seismic Reports](#).
- Japanese volcanoes: [Geological, geophysical, and geochemical constraints on the time-space evolution of Akan composite caldera, Hokkaido, Japan](#).
- Iceland's Fagradalsfjall Volcano: [Rapid shifting of a deep magmatic source at Fagradalsfjall volcano, Iceland](#); Phys.org summary [here](#).
- Forecasting eruptions: [Evaluation of short-term probabilistic eruption forecasting at Whakaari, New Zealand](#); Phys.org summary [here](#).
- [Worldwide Volcano News And Updates](#).

Mining and Energy

- Australian iron ore deposits: [Hematite geochronology reveals a tectonic trigger for iron ore mineralization during Nuna breakup.](#)
- Gold deposit research: [Genesis of the Island Gold Deposit, Ontario, Canada: Implications for Gold Mineralization in the Wawa Subprovince of the Superior Province;](#) behind a paywall.
- [Burst mining dam in South Africa: What must be done to prevent another disaster.](#)
- Ore processing research: [Fizzy ore processing sequesters CO2 while supplying critical metals.](#)
- [Lithium Smashes New Record as Supply Struggles to Feed EV Growth.](#)
- [Forget rare earths, boron is the critical mineral to track.](#)
- Risky business: [Tycoon running a quarter of China's copper trade is on the ropes.](#)
- This affects the efficiency of solar panels: [Computational prediction of dust deposition on solar panels.](#)
- [Oil Declines a Third-Straight Week as Slowdown Fears Escalate.](#)
- [Canada Weekly Rig Count Up 6 for Week Ending September 16, 2022.](#)
- [Formation conditions and reservoir-forming models of the Ordovician buried hill reservoirs in the Jizhong depression;](#) in Chinese, Phys.org summary [here](#); Eureka Alert video [here](#).
- Shale oil research: [Comparative study on the analysis methods of fracture pressure interference in shale oil three-dimensional fracturing.](#)
- From the United States Energy Information Agency(USEIA): [Drilling Productivity Report, September 12, 2022.](#)
- Also from the USEIA: [More natural gas rigs are now operating in the United States than before the pandemic.](#)

New Publications



- From the Geological Association of Canada (GAC): [Special Paper 52: Mineral Systems with Iron Oxide Copper-gold \(IOCG\) and Affiliated Deposits \(PDF Book Version\);](#) only \$20.00 for members of the GAC.

Following upon last week's posting, let's look at some more mammals that lived during the in the [Paleogene Period](#).

Uintatheriidae - *Bathyopsis*

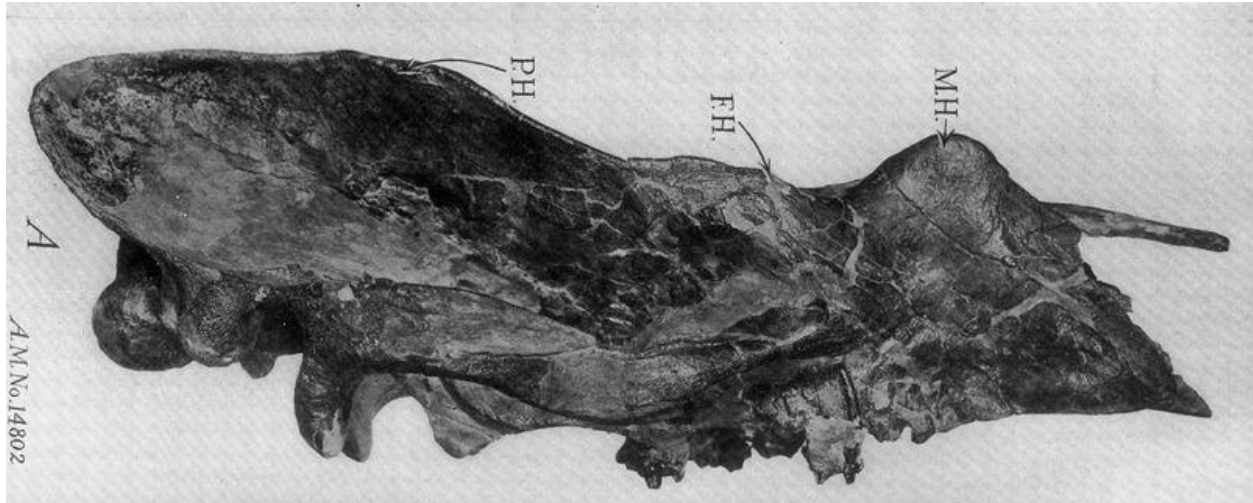


Figure 2 - *Bathyopsis fissidens* Skull.

Credit: Henry Fairfield Osborn and George Olsen, [public domain](#)

Bathyopsis was an [uintatheriid ungulate](#) that lived during the early [Eocene Epoch](#). The fossils of *Bathyopsis* indicate that it was an herbivore, about just under a metre tall (80 cm) and around 100 to 180 kilograms in weight. As a moderately sized herbivore, *Bathyopsis* almost certainly was prey for animals like [Mesonyx](#), as depicted in Figure 3, below.

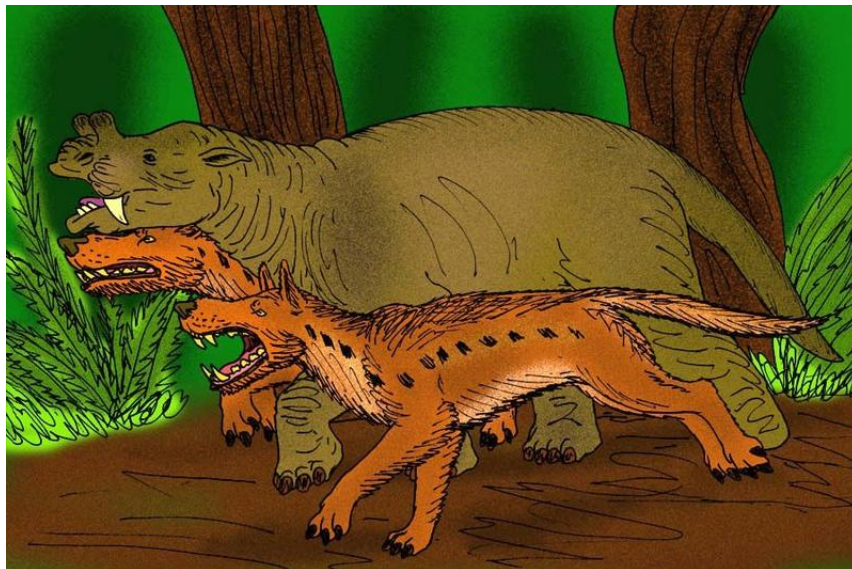


Figure 3 - Reconstruction *Bathyopsis fissidens* pursued by a pair of *Mesonyx obtusidens*

Credit: [Mr. A, Creative Commons Attribution-Share Alike 3.0 Unported, 2.5 Generic, 2.0 Generic, and 1.0 Generic license](#)

A discovery of the [Bone Wars](#), [Edward Drinker Cope](#) first [described](#) *Bathyopsis fissidens* in 1881 from fossils found in the [Wasatch Formation](#) of Wyoming. Later, [Henry Fairfield Osborn](#) found the skull shown in Figure 2. In 1961, [Walter H. Wheeler](#) described a [second species](#) of the genus, [Bathyopsis middleswarti](#).

Uintatheriidae - *Uintatherium*



Figure 4 - *Uintatherium anceps*, [National Museum of Nature and Science](#), Tokyo
Credit: [Momotarou2012](#), [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

Named after the [Uinta Mountains](#) of Wyoming and Utah, [Uintatherium](#) is another uintatheriid ungulate that lived during the Eocene Epoch. A fairly large herbivore, *Uintatherium* was about 1.5 m tall at the shoulder with an overall length of 4 m and a weight around 2 tonnes. It was comparable to the modern [rhinoceros](#).

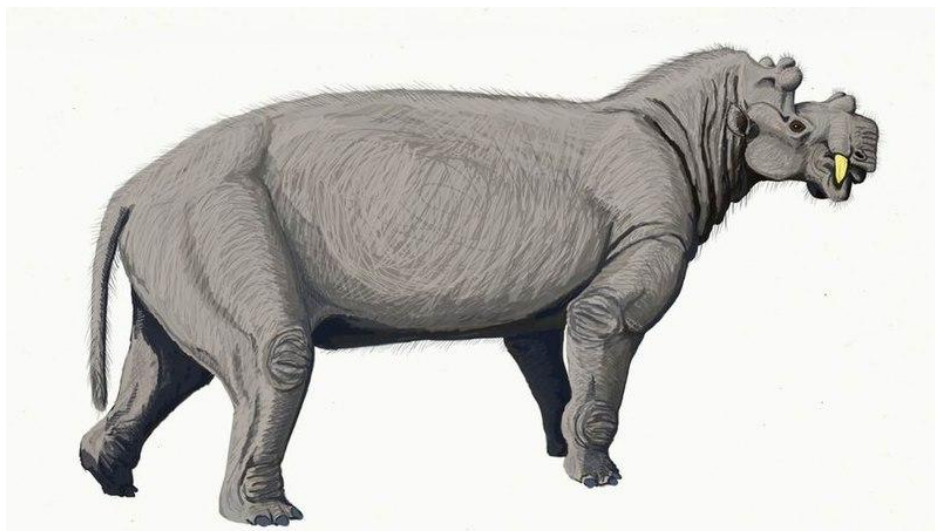


Figure 5 - Reconstruction of *Uintatherium*
Credit: [Dmitry Bogdanov](#), [Creative Commons Attribution-Share Alike 3.0 Unported](#), [2.5 Generic](#), [2.0 Generic](#), and [1.0 Generic](#) license

The discovery of *Uintatherium* is another story from the Bone Wars. Lt. W.N. Wann, stationed at [Fort Bridger, Wyoming](#), found the first fossil bones of *Uintatherium* in 1870. The following year, [Othniel Charles Marsh](#) described the fossil as a [titanotherium](#) *Titanotherium anceps*, although only from a few bones. In 1872, Marsh and [Joseph Leidy](#) searched for more bones in the [Eocene beds near Fort Bridger](#) and in August of that year Leidy published a [description of the fossils](#) calling them *Uintatherium robustum*. Leidy's crew also found another set of bones, thought to be a related species, calling them *Uintamastix atrox*.

Meanwhile Edward Cope, working in the [Washakie Basin](#) found fossils of *Uintatherium* that he called *Loxolophodon*, informing Marsh of the find in a poorly worded telegram 18 days after Leidy published his description of *Uintatherium*. Marsh was busy too, describing *Uintatherium* as *Tinoceras* [in yet another publication](#). Marsh then [gave some of the bones a new name](#) *Dinoceras*. Marsh and Cope kept finding new examples of *Uintatherium* and [kept denouncing one another in print](#). It was great fun. Together they named 25 new species, all of which are now considered synonymous with *Uintatherium*. In the end, [analysis by Walter Wheeler in 1961](#) resolved the issue. Today, there are two recognized species of *Uintatherium*: *U. anceps* and *U. insperatus*.

Mesonychidae - *Mesonyx*

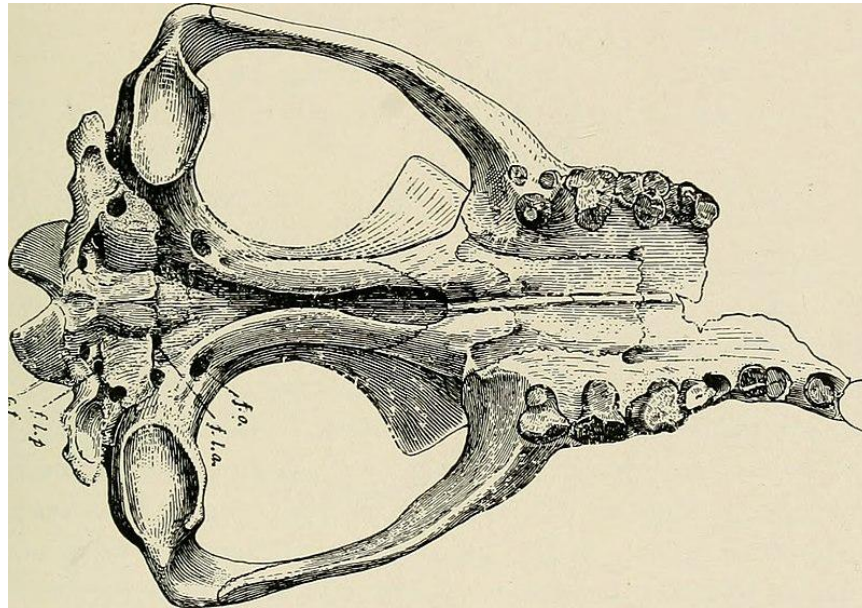


Figure 6 - Skull of *Mesonyx*, Upper Eocene of Utah
Credit: [The American Natural Museum Journal](#), public domain

Found in Eocene aged deposits in the in Colorado, Wyoming, Utah and China, [Mesonyx](#) was one of many small, omnivorous and carnivorous mammals of the now extinct [Mesonychidae](#) family. *Mesonyx* were about 1.25 to 1.5 m long, and 20 to 55 kg in weight. They had long heads and necks relative to the size of their bodies. Instead of claws, their feet ended in small hooves.

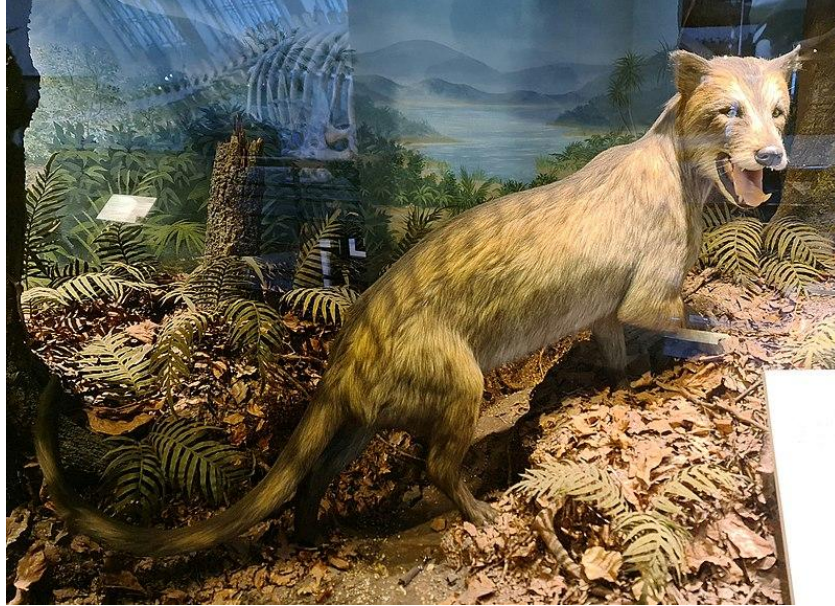


Figure 7 - *Mesonyx* Reconstruction at the [Natural History Museum, London](#)
Credit: [Ricardalovesmonuments](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license

Another discovery of the Bone Wars, Edward Cope first found *Mesonyx* in 1872 in the Eocene deposits of Wyoming. There are four species of *Mesonyx*: *Mesonyx nuhetingensis*, *Mesonyx obtusidens*, *Mesonyx uintensis*, and *Mesonyx uqbulakensis*.

Artiodactyla - *Andrewsarchus mongoliensis*



Figure 8 - Skull of *Andrewsarchus mongoliensis* at the [Natural History Museum, London](#)
Credit: [Emőke Dénes](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license

While most even-toed ungulates (Artiodactyla) are herbivores, [Andrewsarchus](#) was a carnivore, related to [entelodonts](#). Nature often doesn't care for what's aesthetically pleasing and *Andrewsarchus* is a good example of an ugly (to our eyes) but successful creature. Described as the "[World's Largest Predatory Mammal](#)", it may have weighed as much as 2 tonnes. However, we only have one skull of the creature to base this on.



Figure 9 - Reconstruction of *Andrewsarchus*

Credit: [Chrisi1964](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license

Andrewsarchus was one of the many finds of the Central Asiatic Expeditions of the [American Natural Museum](#). [Henry Fairfield Osborn](#) named *Andrewsarchus* after the leader of the Central Asiatic Expeditions [Roy Chapman Andrews](#) in a [paper published](#) in 1924. The skull itself was found by Kan Chuen Pao in the Eocene [Irdiv Manha Formation](#) of Inner Mongolia. There is only one species in the genus: *Andrewsarchus mongoliensis*.

Notoungulata - *Notostylops*



Figure 10 - *Notostylops* Skull

Credit: [Lmalena](#), [Creative Commons Attribution-Share Alike 4.0 International](#) license

[Notoungulates](#) were an extinct order of ungulates that inhabited South America from the early Paleocene to the Holocene. An early example of a notoungulate was [Notostylops](#) that lived during the Eocene in what is now Argentina. *Notostylops* was about the size of a dog and seems to have been a generalist. It may be representative of the ancestors of later notoungulates.



Figure 11 - An artist's illustration of *Notostylops murinus*
Credit: Dinopedia [CC-BY-SA](#)

[Florentino Ameghino](#) named *Notostylops* in 1897 (published in the Argentine Geographic Institute Bulletin 18 (4–9): 406-521, not online) after fossils he found in the [Casamayorensis](#) deposits of Patagonia. Although Ameghino named about 23 species of *Notostylops*, currently only *N. murinus*, *N. appressus*, *N. pendens*, and *N. pigafettai* are recognised.

Notoungulata - *Eurygenium*



Another notoungulate from Argentina was [Eurygenium](#) that lived during the [Oligocene](#). *Eurygenium* had a compact body, approximately 80 cm long and weighing around 10 kg and was a member of the [Notohippidae](#) family.

Another discovery by Florentino Ameghino, [he described](#) *Eurygenium* in 1895. There are three recognised species in the genus: *E. latirostris*, *E. normalis*, and *E. pacegnum*.

Figure 12 - Skull of *Eurygenium*
Credit: [Maria Teresa Dozo](#),
Figure 1 in [Marani and Dozo, 2008](#)

I think that this is a good place to stop for now, we'll look at more mammals from the Paleogene in next week's posting.

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.