

November 29, 2021

News and Notes

Before going on with more discussion on the Proterozoic Eon, let's look at a few news items that I think are interesting.

Geology Can Be Fun

- [Veteran Northern geologist Gary Vivian has survived planes going down, aggressive bears and hordes of mosquitoes.](#)
- Geology can be fun, if you don't mind a bit of risk: [UH-Hilo geology students get 'real-life experience on a volcano'](#).

Geological Time

- [Unlocking mystery of the Great Unconformity.](#)

Volcanoes

- From the United States Geological Survey (USGS): [Volcano Watch — The refilling of Halema'uma'u crater.](#)
- [Black lava from this bizarre volcano could reveal Earth's deep secrets](#); the only volcano that currently erupts [carbonatite](#) minerals.
- [La Palma volcano, live updates today: eruption, tsunami warning and latest news, Canary Islands](#); still erupting.
- [Worldwide Volcano News and Updates.](#)

Mining

- [Russia arrests safety inspectors after coal mining disaster; death toll jumps past 50](#); coal mining has always been dangerous, lazy/crooked safety inspectors just make it worse.
- [Grassy Narrows fighting Ontario's mining claims](#); the reality of doing mining and exploration in Canada is that if you do not get the locals on side, they will block you.
- [Chinese officials in Afghanistan to explore lithium – report](#); with the Americans and their allies safely out of the way, the Chinese are stepping in. Also, the Chinese won't be asking questions about human rights, they just want to do business.

Hydrothermal Deposits

- [Kaleidoscope of Deep-Sea Life Found Near Hydrothermal Vents Off Mexican Coast](#); hot smoker spew vast amounts of metal sulphides, probably one of the sources of massive sulphide deposits.

Energy

- U.S. Energy Information Administration (USEIA): [Recent legislation would reduce the U.S. Strategic Petroleum Reserve](#); clearly they aren't expecting a war any time soon.
- Also from the USEIA: [Average U.S. gasoline prices are higher this Thanksgiving than any since 2012, related](#).
- More from the USEIA: [Monthly Energy Review](#).
- Oops:
 - **November 24, 2021**, CNN: [Oil prices are headed for \\$100 despite U.S. efforts to release reserves, analyst says](#).
 - **November 26, 2021**, Al Jazeera: [Oil plunges as new coronavirus strain sparks fear](#).

Climate Change

- [Gill co-authors report arguing Anthropocene should be a geological event, not an epoch](#); I agree, our industrial civilization will be a minor blip in the grand history of the world.
- [Arctic Ocean started to warm decades earlier than scientists thought](#).
- Research paper: [Eolian stratigraphic record of environmental change through geological time](#).
- More research: [Holocene wet episodes recorded by magnetic minerals in stalagmites from Soreq Cave, Israel](#).

Out of this World

- Australian man finds a meteorite: [Man Keeps a Rock For Years, Hoping It's Gold. It Turned Out to Be Far More Valuable](#).
- [NASA's Mars Insight Lander Uses Wind-Induced Vibrations To Reveal the Red Planet's Subsurface Layers](#); unique geophysics.
- [Astronaut training in the land of volcanoes](#); in the footsteps of [Eugene Shoemaker](#).

Upcoming Events

- The Geological Association of Canada (GAC) and the Mineralogical Association of Canada (MAC) will hold their joint 2022 GAC-MAC Annual Conference in Halifax, Nova Scotia, May 15-18, 2022, [event website here](#).
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The Proterozoic Eon, the Mesoproterozoic Era

| Eon | Era | Period | Ages (mya) |
|-------------|------------------|------------|------------|
| Proterozoic | Neoproterozoic | Ediacaran | 630-542 |
| | | Cryogenian | 850-630 |
| | | Tonian | 1000-850 |
| | Mesoproterozoic | Stenian | 1200-1000 |
| | | Ecstasian | 1400-1200 |
| | | Calymnian | 1600-1400 |
| | Paleoproterozoic | Statherian | 1800-1400 |
| | | Orosirian | 2050-1800 |
| | | Rhyacian | 2300-2050 |
| | | Siderian | 2500-2300 |

Figure 1 – Proterozoic Timeline

Credit: Modified from original by Julisa Cummins,
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This week we'll continue our look at the Proterozoic Eon with a look at the [Mesoproterozoic Era](#) which lasted from 1600 million years ago (Mya) to 1200 Mya. The is generally divided into the Calymnian, Ectasian and Stenian Periods, as in Figure 1.

The Mesoproterozoic Era encompasses the period of time called the [Boring Billion](#). Also called the Barren Billion, the Dullest Time in Earth's History, and Earth's Middle Ages. The Boring Billion is the time period between 1800 and 800 Mya and it was characterized by fairly stable tectonics, climate and biology. Although [eukaryote](#) organisms had evolved, [prokaryote](#) organisms dominated. Also, although there was free oxygen in the atmosphere, the oxygen concentrations were much less than today. However, oxygen concentrations rose steadily throughout the Boring Billion.

Let's look at the individual Periods of the Mesoproterozoic Era.

Calymnian Period

Lasting from 1600 Mya to 1400 Mya, the [Calymnian Period](#) was marked by the beginning of the breakup of the [supercontinent Columbia](#), 1600 Mya, into the fragments shown in Figure 2.



Figure 2 - Supercontinent Columbia

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

The beginning of the Calymnian Period was also marked by completion of the deposition of the [Athabasca Basin](#), a group of quartzite and conglomerate formations deposited between 1760 Ma and 1500 Mya in what is now Northern Saskatchewan. The Athabasca Basin hosts major [uranium deposits](#). Another group of group of quartzite and conglomerate formations deposited during the Calymnian Period was the [Jotnian Group](#) deposited in the Baltic region of Europe 1600–1260 Mya.

Ectasian Period

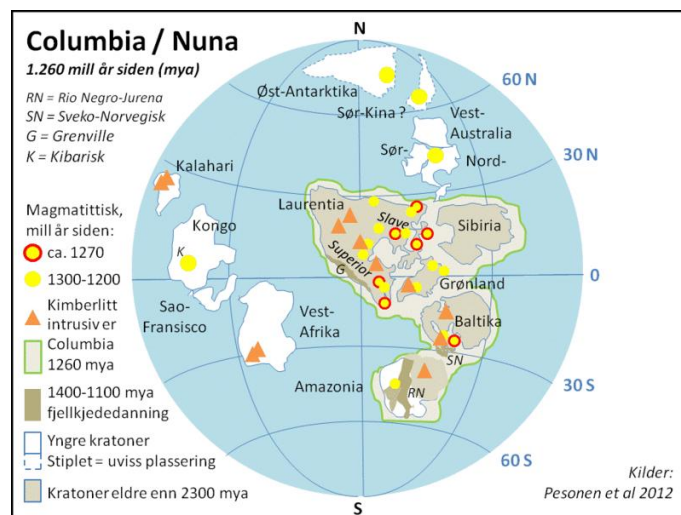


Figure 3 - The World 1260 Mya

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

The [Ectasian Period](#) (also spelled Ectasian) lasted from 1400 Mya ago to 1200 Mya and was marked by the further breakup of the Supercontinent Columbia. An interesting feature of the

sediments from the Ectasian Period is the first fossil evidence for sexual reproduction in microfossils of [Bangiomorpha pubescens](#) (a eukaryote red algae) from the [Hunting Formation](#) on Somerset Island, Canada.

Stenian Period

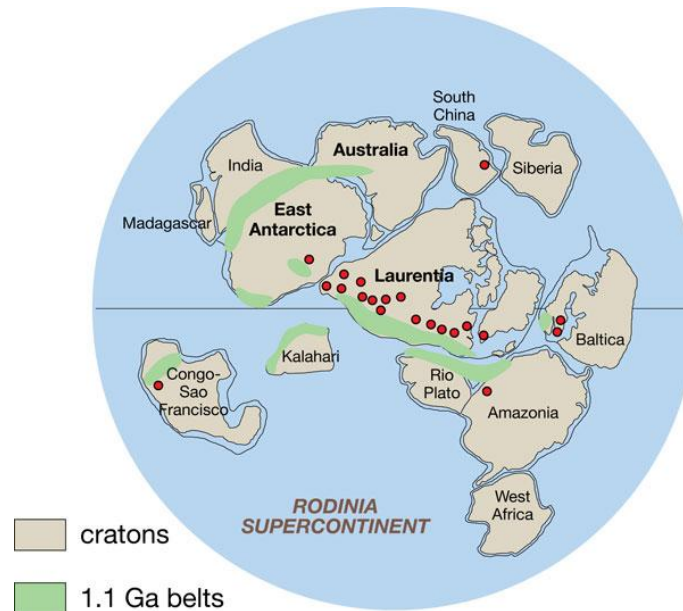


Figure 4 - Supercontinent Rodinia
Credit: John Goodge, [public domain](#)

The final period in the Mesoproterozoic, the [Stenian Period](#) lasted from 1200 Mya to 1000 Mya. The major event of the Stenian was the accretion of the [Supercontinent Rodinia](#). In North America, the assembly of Rodinia was marked by the [Grenville Orogeny](#), on the east coast of the continent. Another major geological event of the Stenian was the creation of the [Midcontinent Rift System](#) in what is now the centre of North America. The [Sleeping Giant](#) near Thunder Bay is part of the Midcontinent Rift System.

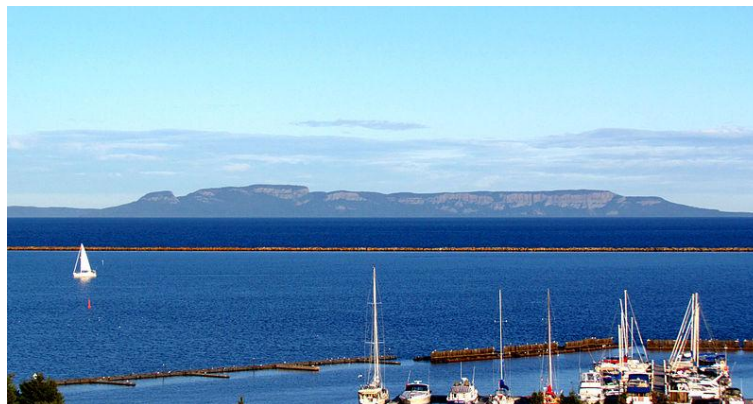


Figure 5 - Sleeping Giant, Thunder Bay ON

Credit: [D. Gordon E. Robertson, Creative Commons Attribution-Share Alike 3.0 Unported license](#)

Was it Really that Boring?

Although part of the Boring Billion ([see the YouTube video](#)), the Mesoproterozoic wasn't really that boring, in my opinion. Yes, the biology and tectonics appear to progress at a sedate pace, but things did change. One supercontinent, Columbia, broke up under tectonic stresses and another, Rodinia came together, under those same tectonic forces.

Our view of the biological changes is constrained by the poor fossil record. Except for the [stromatolites](#), almost all the organisms living at the time were soft bodied and any fossil preservation had to be extraordinary. Further research into the Boring Billion can only uncover more interesting facts.

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.