

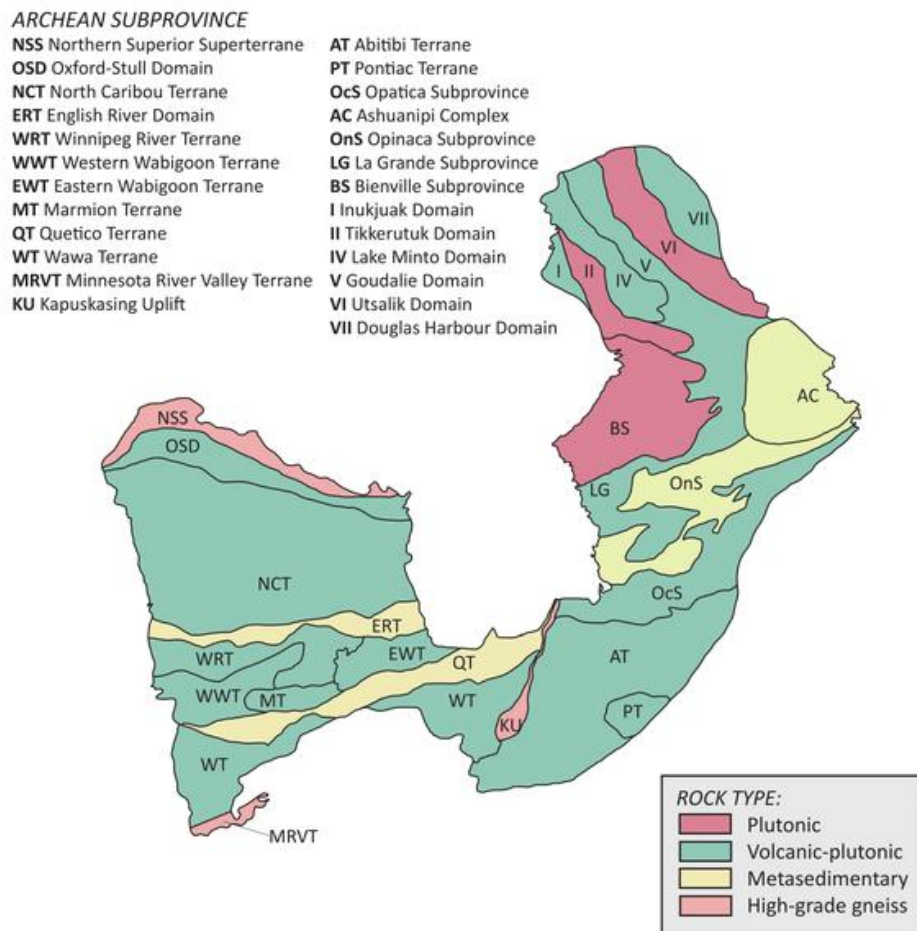
June 13, 2022

News and notes

Before going on to look at some examples of marine vertebrate life during the [Jurassic Period](#), I'll share some photos from the return portion of our road trip. Also, I'll leave last week's blog on the first week of the vacation on the main blog page for another week.

Next week, I'll finish up the Jurassic with a look at some of the marine invertebrates from that period.

Road Trip, Return Portion June 6th - 9th



Archean Belts of Superior Province

Credit: Charlespsml, [Creative Commons](#)

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After we left Cambridge we went north and stayed at Sault St. Marie. The next day we went west towards Nipigon, travelling through the [Archean](#) aged [Abitibi](#) and [Wawa](#) greenstone belts.

Near Terrace Bay we stopped to see [Aguasabon Falls](#).



Aguasabon Falls
By author

Going further west, we passed out of the Archean aged rocks and into the [Proterozoic](#) aged rocks of the [Southern Province](#). East of Nipigon, there are many outcrops of iron rich Proterozoic rocks.



Proterozoic Iron Rich Rocks, East of Nipigon
By author

In the unweathered rock, the iron is present as grey [ferrous oxide](#); in the open air these rocks weather and oxidize to show red [ferric oxide](#).

North of Nipigon, on Highway 11, are [the Palisades](#). The bedrock underlying Lake Nipigon is part of the Southern Province as part of the [Midcontinent Rift System](#).

Another interesting feature of the Nipigon River is that at end of the [Pleistocene](#), Glacial [Lake Agassiz](#) drained into [Glacial Lake Minong](#) (which includes modern Lake Superior) [through the Nipigon River valley](#).

After we spent the night in Nipigon, we went west through Thunder Bay and stopped at [Kakabeka Falls](#). The rocks at Kakabeka Falls are also iron rich Proterozoic rocks of the Southern Province and include the famous [Gunflint Formation](#) which has some of the oldest [stromatolite](#) fossils in the world. Underlying the siliceous Gunflint Formation are iron rich shales all of which are part of the [Animikie Group](#).

The iron rich rocks at Kakabeka Falls are continuously eroded by the action of the water and show the grey ferrous iron of the native rock. Elsewhere in the park, the rocks are weathered to a red colour.



Kakabeka Falls
By author

After Kakabeka Falls we went on to Fort Frances for the last night of our road trip. Some parts of Fort Frances are flooded from high water levels this spring.



Flooding at Fort Frances
By author

On the way back home, we noticed a relatively new gold mine near Fort Frances, the [Newgold Inc. Rainy River Mine](#). It's good to see this kind of development.

June 13, 2022

Marine Vertebrates of the Jurassic

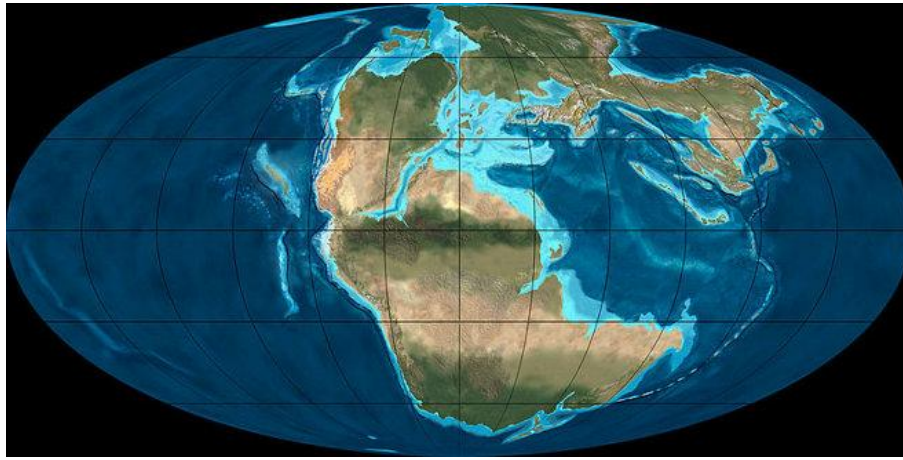


Figure 1 - Early Jurassic Geography

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

Then, as now, the world of the [Jurassic Period](#) was largely covered by water, so it should be no surprise that there was plenty of life in the oceans at that time. This week we'll look at a few examples of marine vertebrates and next week we'll look at some examples of invertebrate life during the Jurassic.

The [End Triassic Mass Extinction](#) thinned out life in the oceans; the entire class of [conodonts](#) [disappeared](#) and approximately [23–34% of all marine genera](#) went extinct. However, plenty of other animals survived and [diversified](#). Vertebrates that lived in the oceans and seas of the Jurassic Period included:

- [Lungfish](#) such as [Ceratodus](#);
- [Lobe finned fish](#) such as [mawsoniid](#) and [latimeriid](#) coelacanths;
- [Bony fish](#), such as [Pachycormus](#);
- [Cartilaginous fish](#) such as [Palaeocarcharias stromeri](#); and
- Reptiles such as [crocodylomorphs](#), [turtles](#), [ichthyosaurs](#), and [plesiosaurs](#).

Let's look at the fossils of some of these remarkable creatures.

A Jurassic Lungfish - *Ceratodus*

One of the most widespread lungfish, fossils of [Ceratodus](#) have been found around the world and in rocks dating from the [Middle Triassic](#) to the [Late Cretaceous](#).

Ceratodus fossils show a lungfish about 60 cm long. As a lungfish, it could live out of water for some time and migrate to water bodies not directly connected to one another. This probably

accounts for its widespread occurrence in the fossil record. Its form suggests that it was not a particularly strong swimmer, an evolutionary trade off for the ability to walk (sort of) on land.



Figure 2 - *Ceratodus* from the Naturhistorisches Museum, Vienna
Credit: [Gyik Toma](#), [Creative Commons Attribution 2.0 Generic](#) license

Modern lungfish are usually omnivorous, eating both plants and animals, essentially whatever they can catch. A possible modern descendant of *Ceratodus*, [Neoceratodus forsteri](#), (a.k.a the Australian lungfish, the Queensland lungfish, the Burnett salmon or the barramunda) gives a good example of its lifestyle. The village of [Ceratodus, Queensland](#) is named after *Neoceratodus forsteri*.

Ceratodus was first described by [Louis Agassiz](#) in 1837 and there are 17 recognised species in the genera.

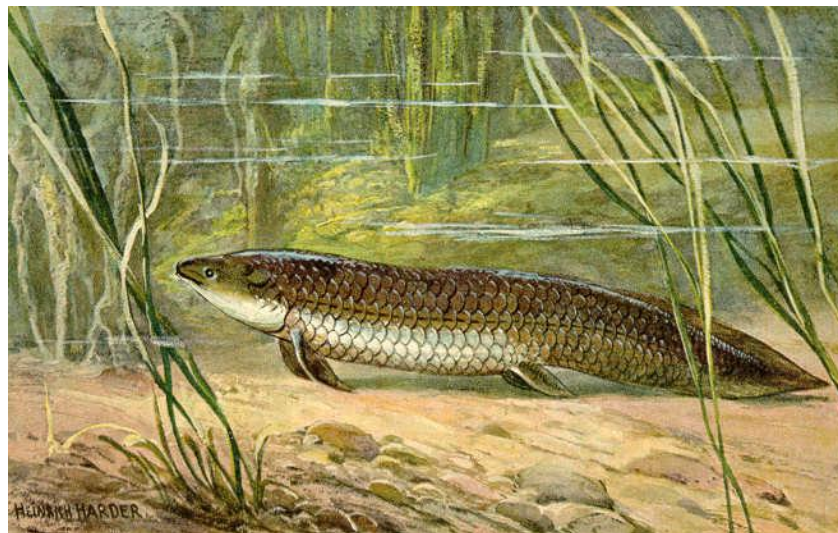


Figure 4 - Reconstruction of *Ceratodus*
Credit: [Heinrich Harder \(1858-1935\)](#), [public domain](#)

A Mawsoniid Coelacanth - *Trachymetopon*



Figure 4 - *Trachymetopon liassicum*, Museum of Paleontology, Tuebingen
Credit: [Ghedoghedo](#), [Creative Commons Attribution-Share Alike 3.0 Unported](#) license

Found in rocks from the [Early Jurassic](#) to the [Middle Jurassic](#), [Trachymetopon](#) was a mawsoniid lobe fin fish or [coelacanthiform](#) similar to modern coelacanths. *Trachymetopon* fossils are found in the Early Jurassic [Posidonia Shale](#) of Germany and the Middle Jurassic of Normandy. The original specimen from Germany was 1.6 m long while the specimen from Normandy [was probably 4 m long](#).

Trachymetopon was first described by [Edwin Hennig](#) in 1951 and there is only one species in the genera, *T. liassicum*.

Undina penicillata, a Latimeriid Coelacanth



Figure 5 - *Undina penicillata*
Credit: Oilshale, [Creative Commons Attribution-Share Alike 4.0 International](#) license

[Undina](#) was a genus of [latimeriid](#) coelacanth that is found in fossils dating from the [Triassic Period](#) to the [Cretaceous Period](#). There are six species in the genera, one which, [Undina](#)

[penicillata](#) dates from the Jurassic Period. The fossil of [Undina penicillata](#), in Figure 5 above, is about 32 cm long and is from the [Painten Formation](#) in Germany.

Undina penicillata has also been called [Holophagus penicillatus](#) in paleontological literature. *Undina penicillata* was described by [Georg zu Münster](#) in 1834 whereas [Philip de Malpas Grey Egerton](#) described it as *Holophagus penicillatus* in 1861. Eventually it got settled as researchers recognised the duplication and the older name was given priority.

***Pachycormus*, a Bony Fish**

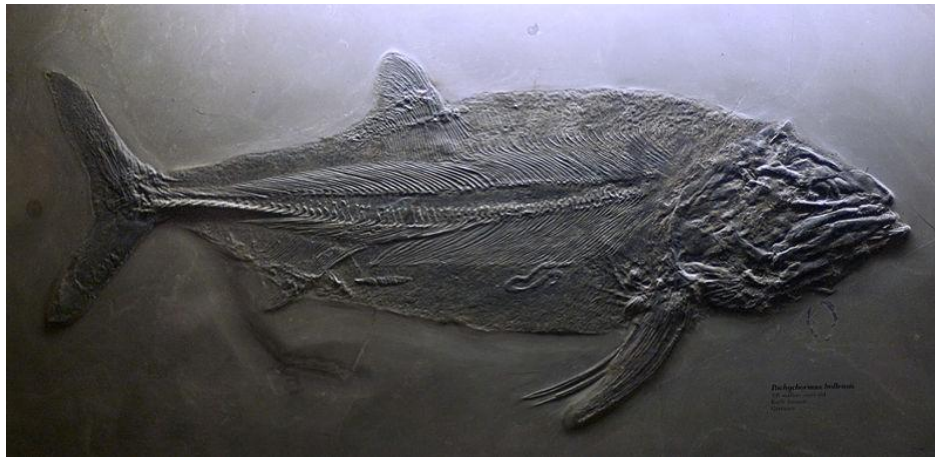


Figure 6 - *Pachycormus bollensis*

Credit: [Jeff Kubina](#), [Creative Commons Attribution 2.0 Generic](#) license

From the Early Jurassic, [Pachycormus](#) was first described by [Henri Marie Ducrotay de Blainville](#) in 1818 who placed it in the genus [Elops](#). Later re-analysis by Louis Agassiz placed the fossils in a new genus, *Pachycormus* in 1833. The fossils show a generalist predator around 1 m long.

Pachycormus is considered a "[stem group](#)" that later diversified into a larger group [Pachycormiformes](#). Researchers have found fossils of *Pachycormus* in France, Germany and England including the Posidonia Shale of Germany and the Strawberry Bank [Lagerstätte](#) of the [Beacon Limestone Formation](#) in the United Kingdom.

***Palaeocarcharias stromeri*, a Cartilaginous Fish**

A cartilaginous fish belonging to the [elasmobranches](#), fossils of [Palaeocarcharias stromeri](#) are found in [Late Jurassic](#) rocks of [Solnhofen](#) and [Eichstätt](#) in Germany and the [Canjuers Lagerstätte](#) in France. A small shark, *Palaeocarcharias stromeri* [may be related to ancestors](#) of modern day sharks such as the [Great White Shark](#).

The earliest description of *Palaeocarcharias stromeri* was by G. de Beaumont, but the paper is not available on line.



Figure 7 - *Palaeocarcharias stromeri*

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

Pelagosaurus, a Marine Crocodylomorph

Pelagosaurus was a [thalattosuchian](#) crocodylomorph that lived in the Jurassic seas. Geologists found fossils of *Pelagosaurus* in the Early Jurassic rocks of France, England, Germany and Switzerland. *Pelagosaurus* was about 3 m long and clearly adapted to a predatory life in the water.

The first fossil of *Pelagosaurus* was found in Normandy but the type species of the genus was first described by [H. G. Bronn](#) in 1841 from fossils found in the [Lias Group](#) of Somerset England.



Figure 8 - *Pelagosaurus typus*

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

Turtles - *Thalassemys*

Thalassemys was a turtle that lived in the Late Jurassic and were found in the [Reuchenette Formation](#) of Switzerland and first described by [Ludwig Ruetimeyer](#) in 1873. Other fossils of

Thalassemys have been found in Germany and England. There are three accepted species of *Thalassemys*, with *T. hugii* as the type species.

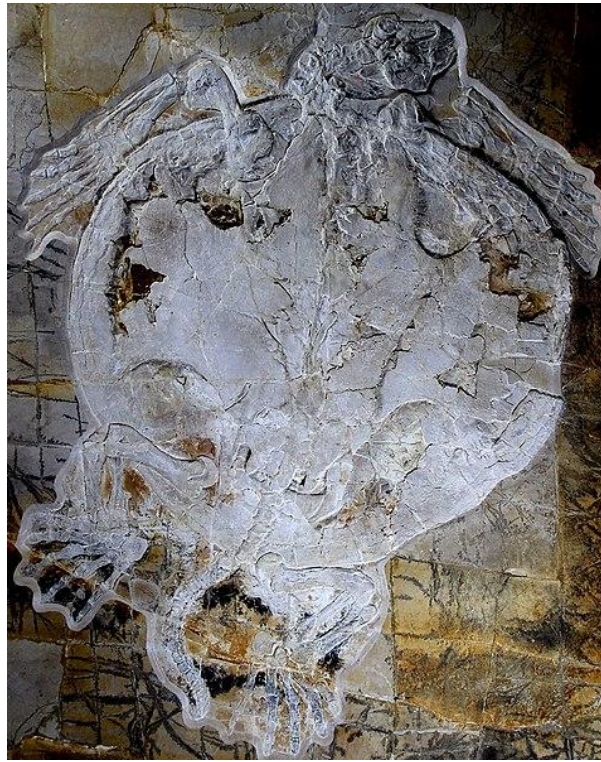


Figure 9 - *Thalassemys bruntrutana*

Credit: [Walter G. Joyce, Matthias Mäuser & Serjoscha W. Evers](#)
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Ichthyosaurus, a Marine Reptile



Figure 10 - *Ichthyosaurus*

Credit: [Ballista](#), [Creative Commons](#)
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First found by in the early 19th century by [Mary Anning](#) in England, the term *Ichthyosaurus* was first used by [Charles König](#) in 1818. [Henry De la Beche](#) and [William Conybeare](#) were the first to

assign a name to a species, *Ichthyosaurus communis*, in 1822. Since then, paleontologists have recognised five other species of *Ichthyosaurus* from fossils found throughout the Early Jurassic deposits of Europe. *Ichthyosaurus* was approximately 3.3 m long and lived in the [epicontinental seas](#) of what is now Western Europe.

[A statue of Mary Anning](#) was recently unveiled in her home town of [Lyme Regis, England](#).



Figure 11 - Mary Anning, Lyme Regis, England
Credit: Carbonmoon, [Creative Commons Attribution-Share Alike 4.0 International](#) license

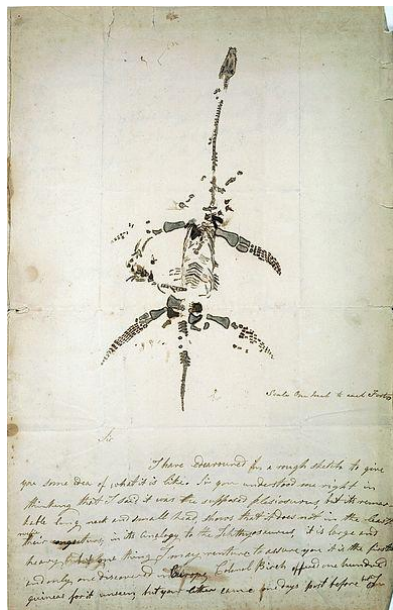
[Mary Anning is the inspiration for the tongue twister](#) "she sells sea shells by the sea shore".

***Plesiosaurus*, another Marine Reptile**



Figure 12 - *Plesiosaurus*

Credit: [Kumiko](#), [Creative Commons Attribution 2.0 Generic](#) license



William Conybeare and Henry De la Beche were the first name the species *Plesiosaurus* from partial remains in 1821 and Mary Anning discovered the first complete fossil skeleton of *Plesiosaurus* in 1823. The fossil came from the Early Jurassic rocks of the [Blue Lias](#) formation of the lower Lias Group. There is only one species in the genera, *P. dolichodeirus*.

Plesiosaurus was a marine reptile, about 3.5 m long. The teeth and jaw structure in the fossil suggest that it ate a variety of food such as clams and snails, belemnites, and fish. Again, like most predators, it ate whatever it could catch.

Figure 13 - *Plesiosaurus* in Mary Anning's Note Book
Credit: [Mary Anning \(1799-1847\)](#), [public domain](#)

Wrapping it Up

There are plenty of marine vertebrates from the Jurassic, so if, like Mary Anning, you are fascinated with these ancient creatures, follow up on some of the links provided above.

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.