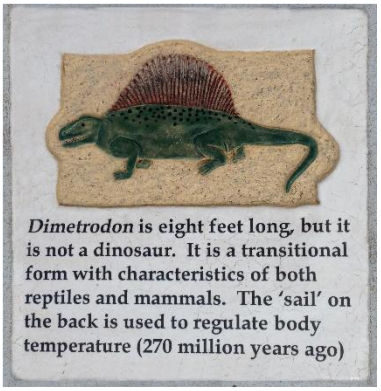


38. <u>Dimetrodon,</u> E. –Mid Permian

Dimetrodon ('two-measure tooth' refers to a feature of its teeth), was a genus of mammal-like reptiles that had several species, all with large spine-supported 'sails' on the back. These sails may have functioned as sexual attractants, or to help regulate body temperature by capturing heat from the sun during cold spells, and dissipating body heat during hot spells. *Dimetrodon* was not a dinosaur. It was not even a true reptile but instead was a transitional form between reptiles and mammals. A key diagnostic feature to distinguish between mammals and various kinds of reptiles is the number and position of openings in the skull behind the eye sockets. Mammals and mammal-like reptiles are all synapsids, which means they have one opening in all diapsids, which means they have two openings in the skull behind the eye socket. Turtles are a bit different; they are anapsids, which means they don't have holes in the skull behind the eye. Marine reptiles like ichthyosaurs and plesiosaurs had just one opening, but it was in a different place on the skull, and they are called euryapsids. These fundamental features shared across a wide variety of creatures help paleontologists unravel the evolutionary relationships between them. From these findings, it appears that Dimetrodon is a closer relative of humans than birds!

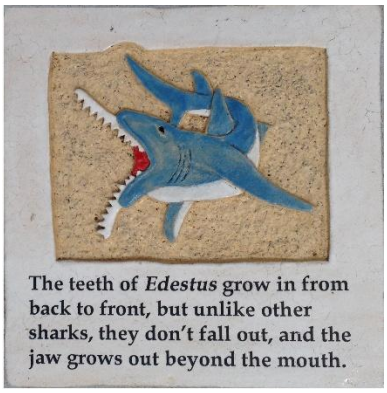
39. Platyhystrix, E Permian

Platyhystrix sp. was one of many large predatory amphibians that lumbered across the late Paleozoic landscape. It was distinctive in that it had a large 'sail' of skin on its back that was supported by large spines. This 'sail' may have functioned to attract mates or scare off rivals, or it may have been used to capture heat from the sun to warm its cold-blooded body. At the same time as *Platyhystrix* ('flat porcupine') lived there were at least two other large animals, though not amphibians, that had large sails on their backs. One of these is the well-known Dimetrodon. It is a bit of a mystery why such different animals developed the same unusual anatomical feature at roughly the same time. One thought is that cooler climates favored this feature in these cold-blooded animals.

40. 300 Ma panel – Marine scene in Medford

The rocks or these volcanic island arcs eventually were all smashed against the western edge of North America in a long-lasting collision. Along with the island sediments, chunks of oceanic crust were incorporated into an incredible mush of different ages and types of rock. Intense heat and pressure turned them into metamorphic rocks.

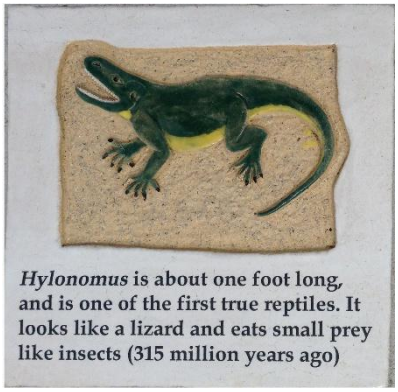
Some of the life of those Devonian seas would be familiar to us today. Sharks and bony fish, starfish and snails would have been familiar. But the abundance of ammonites and nautiloids, and the crawling trilobite, would have seemed strange.



The teeth of *Edestus* grow in from back to front, but unlike other sharks, they don't fall out, and the jaw grows out beyond the mouth.

41. <u>Edestus,</u> Pennsylvanian 25.7 m

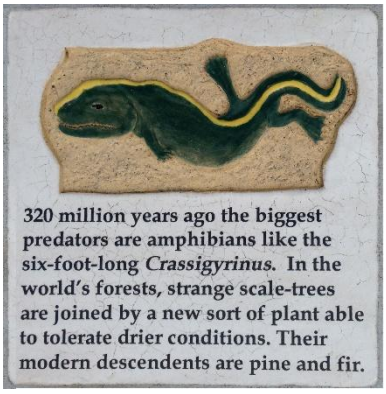
Edestus giganteus was one of the stranger sharks (or any other animal for that matter). Like all sharks its teeth grew from front to back, so that new teeth pushed older teeth in front of them to the front of the mouth. In all sharks (except *Edestus* and a couple other species) old teeth keep pace with the formation of new teeth and drop out of the jaw as they are pushed to the front of the mouth. But in *Edestus,* the old teeth didn't drop out, they stayed. This caused the jaws and teeth to extend far beyond the front of the mouth. In a related genus, *Helicop1ion,* the extended teeth formed a coil, a great spiral of teeth hanging out of the mouth! With its strange teeth and huge size *Edestus* must have been one of the most spectacular predators to have lived in the seas.



Hylonomus is about one foot long, and is one of the first true reptiles. It looks like a lizard and eats small prey like insects (315 million years ago)

42. Hylonomus, E Pennsylvanian 24.7 m

Hylonomus lyelli ('Lyell's wood mouse'), marks the first appearance of a true reptile in the fossil record. This animal had a skeleton much like a modern lizard, with a slender body, a long tail and sharp pointed teeth. Its remains have been found in fossil tree stumps, of all places, in Pennsylvanian rocks of Nova Scotia, Canada. *Hylonomus* probably ate insects and other small arthropods. It may have entered the hollowed-out tree stumps looking for food or shelter and became trapped and then buried. This early reptile, or one of its close cousins, eventually gave rise to all later reptiles, including the dinosaurs, and to mammals, including you and me. *Hylonomus* is such a famous little fossil that it has been made the Provincial Fossil of Nova Scotia.



320 million years ago the biggest predators are amphibians like the six-foot-long *Crassigyrinus.* In the world's forests, strange scale-trees are joined by a new sort of plant able to tolerate drier conditions. Their modern descendents are pine and fir.

43. Crassigyrinus, Mississippian 24 m

Crassigyrinus scoticus ('thick tadpole of Scotland') was an amphibian, although its exact place in taxonomy is still debated. It was large, about two meters long. That is a big tadpole! But in the early years of tetrapod life on land, amphibians were the dominant animal type, and several fierce amphibian predators ruled the steamy swamps of the time. One of these was *Crassigyrinus*. It appears to have had a strong set of jaws and two rows of sharp teeth, even a pair of fangs. It also had large eyes, which suggests it either hunted at night or in murky swamp water. The back legs were small, and the front limbs were so tiny as to be almost useless. It probably was almost completely aquatic, swimming with its strong tail, and perhaps pushing itself along in shallow water with its hind legs.