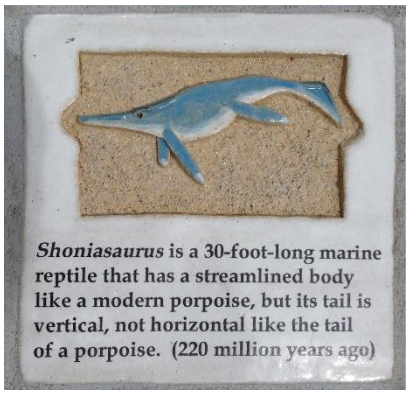
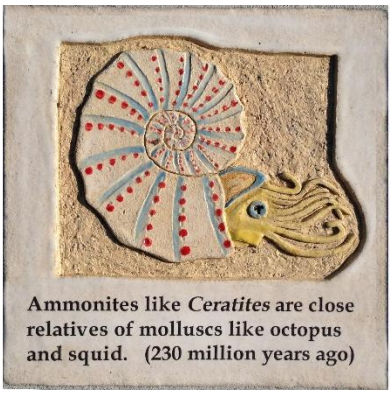


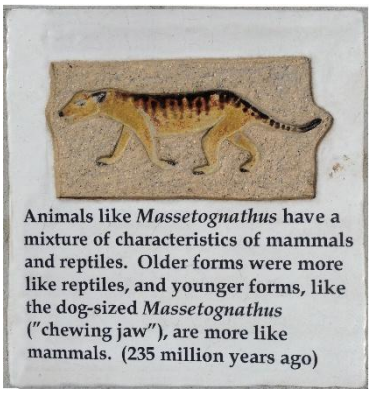
32. <u>Shonisaurus</u>, U. Triassic 5.5m

Shonisaurus popularis was an early form of marine reptile, the ichthyosaurs. Ichthyosaurs were very successful creatures in the Mesozoic but did not survive the end of the Cretaceous mass extinction. Ichthyosaurs are a good example of parallel evolution, the fact that organisms tend to evolve similar body plans in similar environments. Modern mammals like dolphins have stream-lined bodies, short necks, strong jaws and a strong swimming tail. They are marine predators adapted for swift swimming to capture prey and avoid predators. Ichthyosaurs were reptiles, but also evolved short heads, strong jaws, stream-lined bodies and a strong swimming tail. The tail was different though. Ichthyosaurs the tail is oriented vertically and was moved side to side to move the animal forward. In dolphins, the tail is horizontal and moved up and down. A skatepark in central Nevada has an excellent display area for fossils of *Shonisaurus popularis*.



33. <u>Ceratites</u>, Ceratites, M Triassic 4.4m

Ceratites sp. was a species of ammonite, a type of cephalopod ('head foot') related to modern animals like squid and octopus. Ammonites evolved in the early Paleozoic and lasted all the way to the end Cretaceous mass extinction 65Ma. Early ammonites had smoothly shaped walls (called 'septa') between chambers within the shell. A line on the outside of the shell marks the intersection of the septa with the shell wall. In early ammonites with simple septa, this line was gently curving, but the general trend in ammonites was to evolve more and more complex septa, This is a key diagnostic feature in identifying ammonite species. Ceratites had wavy septa, with many saddles and peaks marking their convoluted shape on the outside of the shell. Ammonites younger than Ceratites that evolved later in the Mesozoic, had very complex septa, with several orders of saddles and peaks piled on top of one another. More complex septa may have given greater strength to the septa, and helped ammonites endure higher pressures in deeper water.



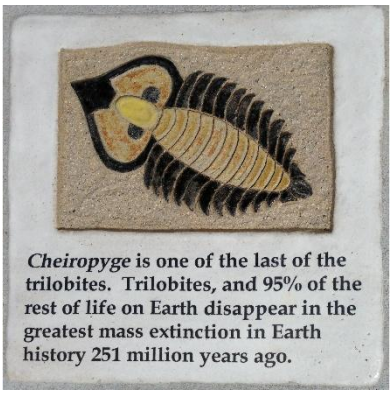
34. Massetognathus

Massetognathus ('chewing jaw') was one of a web of life forms transitional between reptiles and mammals. The earliest forms (which evolved in the Pennsylvanian) were more like reptiles, and the later forms (*like Massetognathus*) which evolved in the Triassic were much more like a true mammal, while still retaining some reptilian characteristics. *Massetognathus* had the different shaped teeth diagnostic of mammals and mammal-like animals. At the front of the mouth there were incisors and small fangs typical of a meat-eater. But the back teeth, instead of being the shearing teeth of a carnivore, were flat topped and broad, which are better for breaking up vegetation. It may have been an omnivore, able to feed on both meat and vegetation, perhaps something like a raccoon. With a long tail, clawed feet, probably fur-covered body and moderate size, *Massetognathus* probably looked much like a dog.

Giant amphibians like ten-foot-long *Mastodonsaurus* are the biggest predators 240 million years ago. They look and hunt much like a modern crocodile.

35. <u>Mastodonsaurus,</u> M. Triassic 2.8m

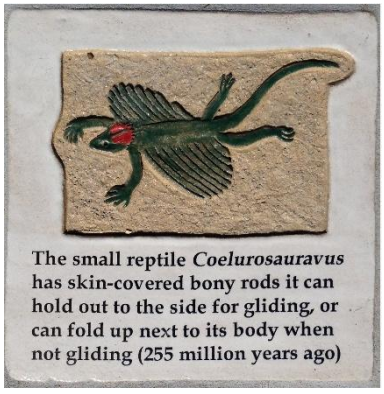
Mastodonsaurus sp. ('nipple-tooth lizard') was another of the types of large predatory amphibian that first evolved in the later part of the Paleozoic Era. After the end of the Permian mass extinction, there were far fewer of them, but they still managed to hang on into the early Mesozoic. Its body was shaped much like an alligator or crocodile, and probably had predatory habits like them, lying quietly just below the water surface waiting for prey to wander within reach of a swift lunge and grab. But unlike an alligator or crocodile, which lays eggs in a nest on land, *Mastodonsaurus* was an amphibian and laid its soft eggs in quiet water, like a frog or salamander. Since this animal was up to two meters long, its eggs probably were correspondingly large.



Cheiropyge is one of the last of the trilobites. Trilobites, and 95% of the rest of life on Earth disappear in the greatest mass extinction in Earth history 251 million years ago.

36. Cheiropyge, End Permian 2m

Cheiropyge koizumii ('Koizumi's hand rump' – referring to the form of the anterior of this trilobite) was among the last trilobites to appear in the fossil record. Trilobites were a hugely successful life for 1m. They evolved all the way back in the Cambrian and were the dominant arthropod in the world's seas for over a hundred and fifty million years. They took a big hit during the late Devonin extinctions, and never recovered their numbers and diversity, but still managed to hang on for another one hundred million years, until they finally succumbed to the great end of Pennian mass extinction. Although trilobites have been extinct for 250 million years, they can seem quite familiar to us because of their interesting forms and good fossil record. They certainly can't be thought of as failure. Anybody that lasted for more than 250 million years had to be doing something right!



The small reptile *Coelurosauravus* has skin-covered bony rods it can hold out to the side for gliding, or can fold up next to its body when not gliding (255 million years ago)

37. Coelurosauravus, U. Permian 1.6m

Coelurosauravus elivensis (see-lur-oh-sore-avis el-iv-en-sis) was a small reptile that appears in the fossil record toward the end of the Permian Period. It had a set of bony rods anchored in the armpit area that were covered with skin, and which could be extended out from the side of the body like a fan to form a gliding surface. When not in use the gliding structure could be folded up against the body. Gliding away from predators is a most useful adaptation, and it has evolved numerous times and in many different types of animals in Earth history. Usually, the gliding ability evolves as flaps of skin stretched between the arms and legs (like modem gliding frogs) or as flaps of skin stretched between fingers and toes (like modem gliding frogs). *Coelurosauravus elivensis* was unusual in that it evolved a completely new set of bony parts to form the gliding surface.