

THE AGE OF REPTILES

h1 The Age of Reptiles and mobility in the marine realm

< middle life >

... fields of science-cannot [all] be unambiguously resolved through an appeal to empirical evidence. [Clifford] Geertz has argued that his own field of anthropology is and may always be a half-literary, half-scientific enterprise.[¹] Geertz's [portmanteau] term *faction*, which he defines as 'imaginative writing about real people in real places at real times,' aptly describes Freud's case histories.

—John Horgan *The Undiscovered Mind*, 1999.²

St. Keyne's chapel; and that Keyne [a Celtic saint of the 5th century] herself, is depicted in another window surrounded by bits of snake (one bit curled up looks very much like an ammonite). Keyne has dedications in Keynesham, SE of Bristol, [UK,] (where she petrified the snakes that had previously made the land inhospitable)

—excerpted from the Wellsprings Fellowship Newsletter, Issue 3, Winter 2000.³

The [heraldic] arms show three snake-stones, or ammonites. According to legend Abbess Hilda [610-680 C.E.] of Whitby Abbey [Northumbria, UK] rounded up the serpents that swarmed around the abbey. She hurled them from the [sea] cliffs, where they lost their heads and turned into stones.

—Information from postcards from Whitby.⁴

A vision of three worlds in time, each with greatly different life, was formalized in 1840 when John Phillips named the eras. Animals ascendant in the Cenozoic are mammals, in the Mesozoic are large terrestrial, marine, and flying reptiles and marine ammonoid ammonites ("snake stones"), and in the Paleozoic are amphibians, fish and marine invertebrates.⁵

Profound extinction events bracket the Mesozoic Era. These occurred during times of very different ecological conditions:

The end-Mesozoic extinction event (*see* Topic *h22*) occurred at a time when the continents were widely submergent. The Arctic ocean was free of ice.⁶ Extinctions fell most heavily on reptilian life and upon certain marine invertebrate life. Flowering plants, which came into being during the Cretaceous, were not noticeably affected, however.

The last of the great inundations was at full flood through the Cretaceous. Existing continents had come into being from the breakup of supercontinent Pangea. The inundation was underway end-Middle Jurassic when, Laurentia and Gondwanaland continents came to be by the opening of the southern North Atlantic ocean and the transcurrent faulting that split Pangea (ending its existence). Nectonic fishes evolved rapidly. For radiating marine invertebrate life, an evolutionary theme was one of mobility: Epifaunal, grazers (sea-urchins) and predators (starfish, cephalopods, and gastropods—some likely as venomous as today's Indo-Pacific Conidae "cone snails" that kill fish, and on record 30 humans, almost instantaneously but painlessly with analgesics injected through hollow-harpoon tooth *slowly protruded* (so be warned, when collecting, put these, even if they seem dead, in a bucket—not your pocket) from a fleshy tube extendable far out of the shell's narrow end)⁷ diversified. Filter and mud feeders (clams, sand-dollars, worms) diversified as infaunal burrowers. Exceptions to the trend to motility are corals and bryozoans. These remain sessile benthonic.

The Jurassic saw the evolution of the clade of venomous anguimorphs (Gila Monster and Beaded Lizard), iguanians (Monitor Lizards and Iguania), and snakes from other lizards (some of which like snakes go legless but all have eyelids and ear openings absent in snakes—which cannot blink, are deaf, and most have one lung).⁸ Also then, birds diverged from among non-avian feathered dinosaurs.

Mobilities of marine invertebrates were survivor-traits of ancestors that had bested the long time of the Triassic when Pangea was mostly emergent and when its continentality and a single coastline was a guarantee of low diversity for shallow-water marine life that clung to it.

Any pretensions for greatness of the true-mammals was held at bay, throughout the Mesozoic, by true reptiles: extant orders—crocodiles, lizards (Squamata), Tuatara, turtles; and extinct orders—dinosaurs (Saurischian and Ornithischian), ichthyosaurs, phytosaurs, pleistosaurs, and pterosaurs. All the true reptiles had diversified from thecodonts, an order of the subclass Diapsida (**Figure h 1.1**) or “ruling reptiles.”

The supercontinent Pangea was the staging ground for the divergence of true mammals (shrew-like animals, subclass Prototheria) from the therapsids (an order of the subclass Synapsida,. The synapsids (mammallike reptiles) went extinct at the end of the Triassic. They had ranged Pangea and had been the dominant land life during the period.

Thecodonts in torrid climes and Therapsids that ranged into cold climes, were survivors (with destinies not to be guessed) of the extinction event (*see Topic i23*) that demarks the boundary between the Mesozoic and the Paleozoic. □

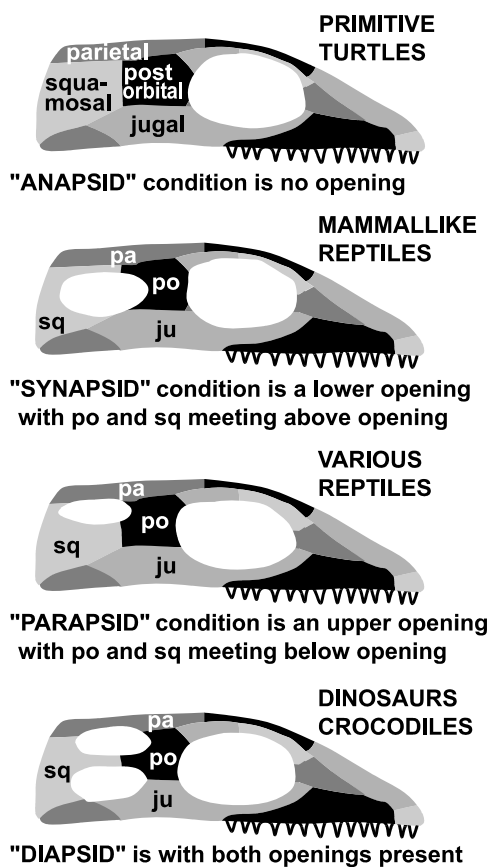


Figure h 1.1 after Fig. 132 in *Vertebrate Paleontology, 1955, by Alfred Sherwood Romer (1894-1973).*⁹

Diagrammatic side views of reptilian skulls to show the position of temporal opening that can be present (the primitive “anapsid” condition is no openings).

The openings developed in various reptilian orders to allow for the bulging of temporal muscles that work the jaws. Those muscles bulge inward as the reptilian skin over the head is a fairly inelastic tight fitting cap.



In the Henningian era much uncertainty attends the position of turtles amongst extant forms. In particular O. Rieppel and others have suggested that the turtles have lost both the upper and lower temporal fenestra and so are a sister clade to lepidosaurs.¹⁰

Cladogram of the Amniota after Michel Laurin & Jaques A. Gauthier *Tree of Life, 1996.*¹¹

