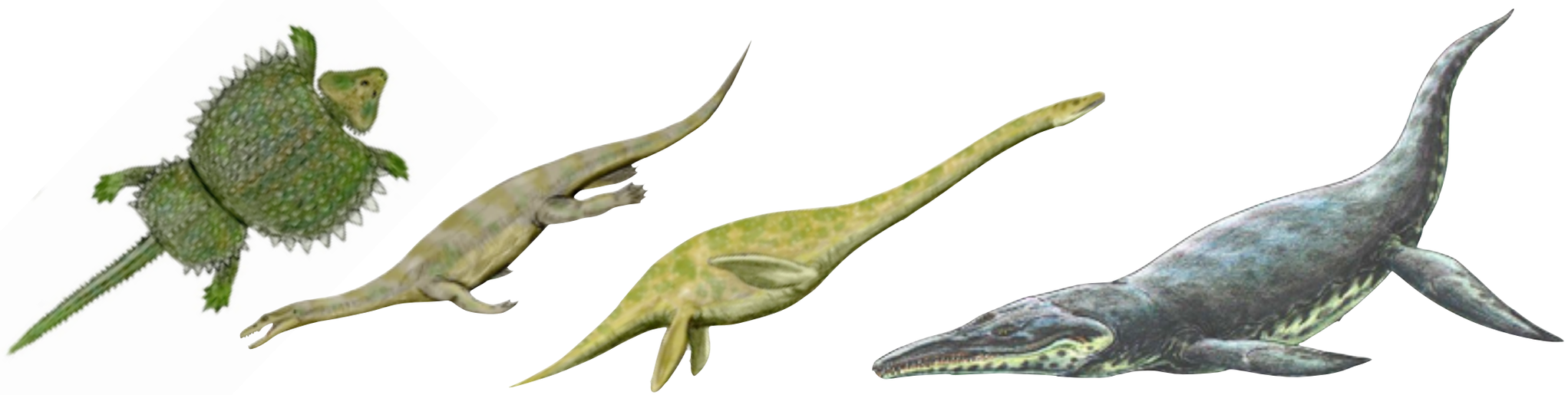
Ichthyosaurs:
Basal Lepidosaurs or sister taxa?

Lepidosaurs
- Lepidosauria
- Sauropterygia



Placodonts
Nothosaurs
Plesiosaurs
Pliosaurs

Ichthyoptygeria

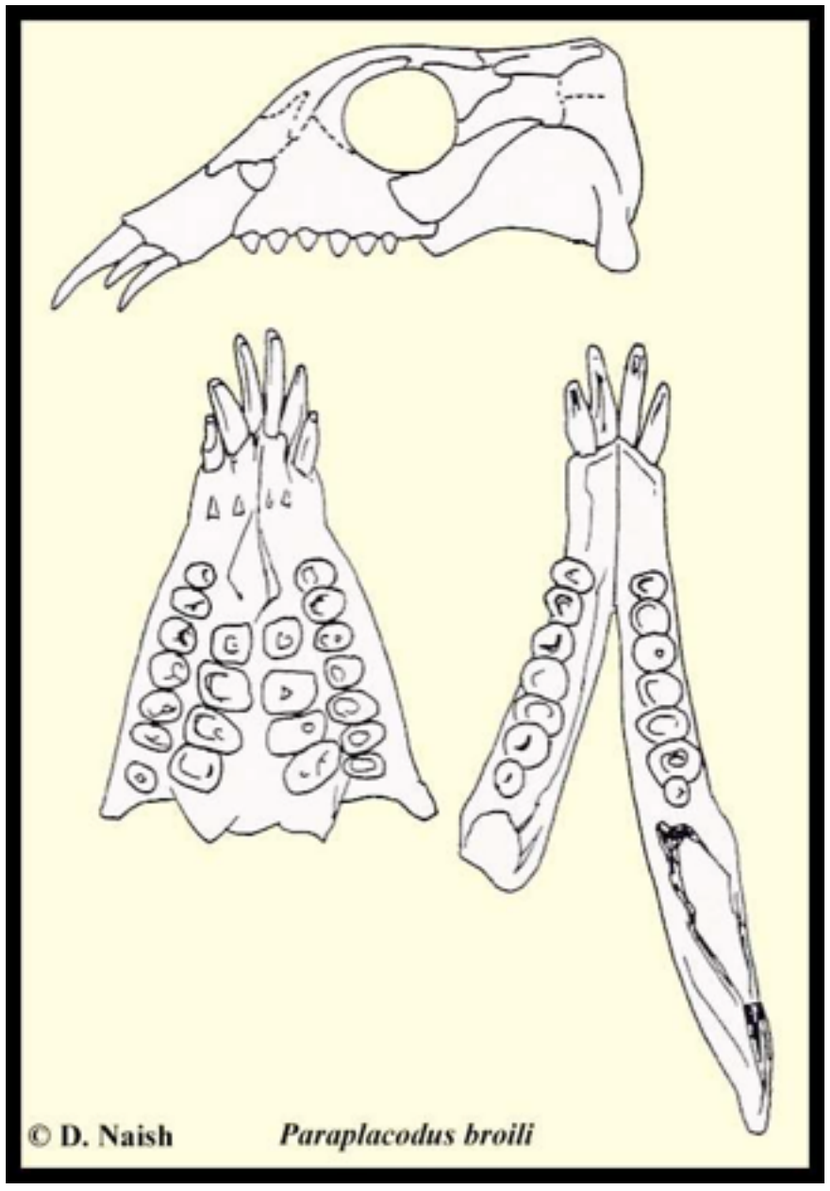
Archosaurs

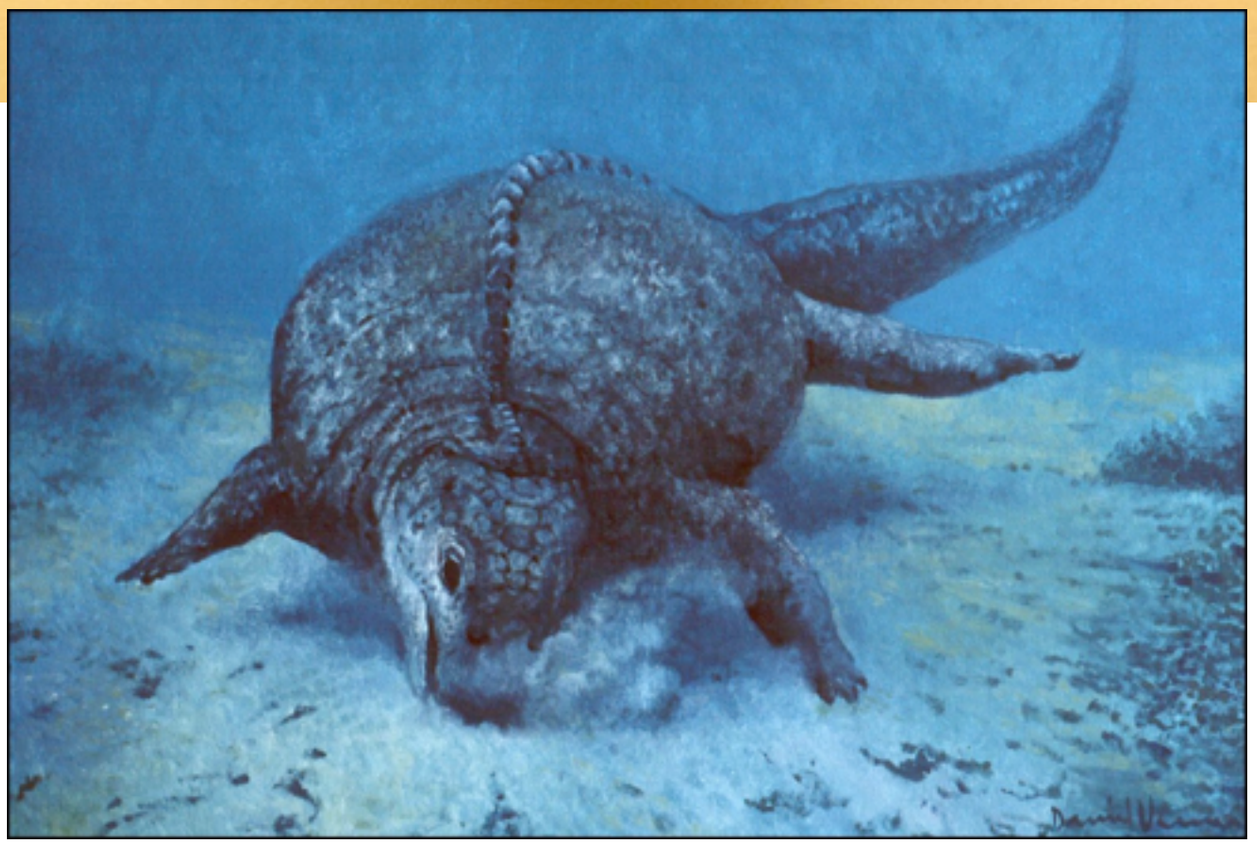
Sauropterygia

Lepidosauramorpha

Placodonts

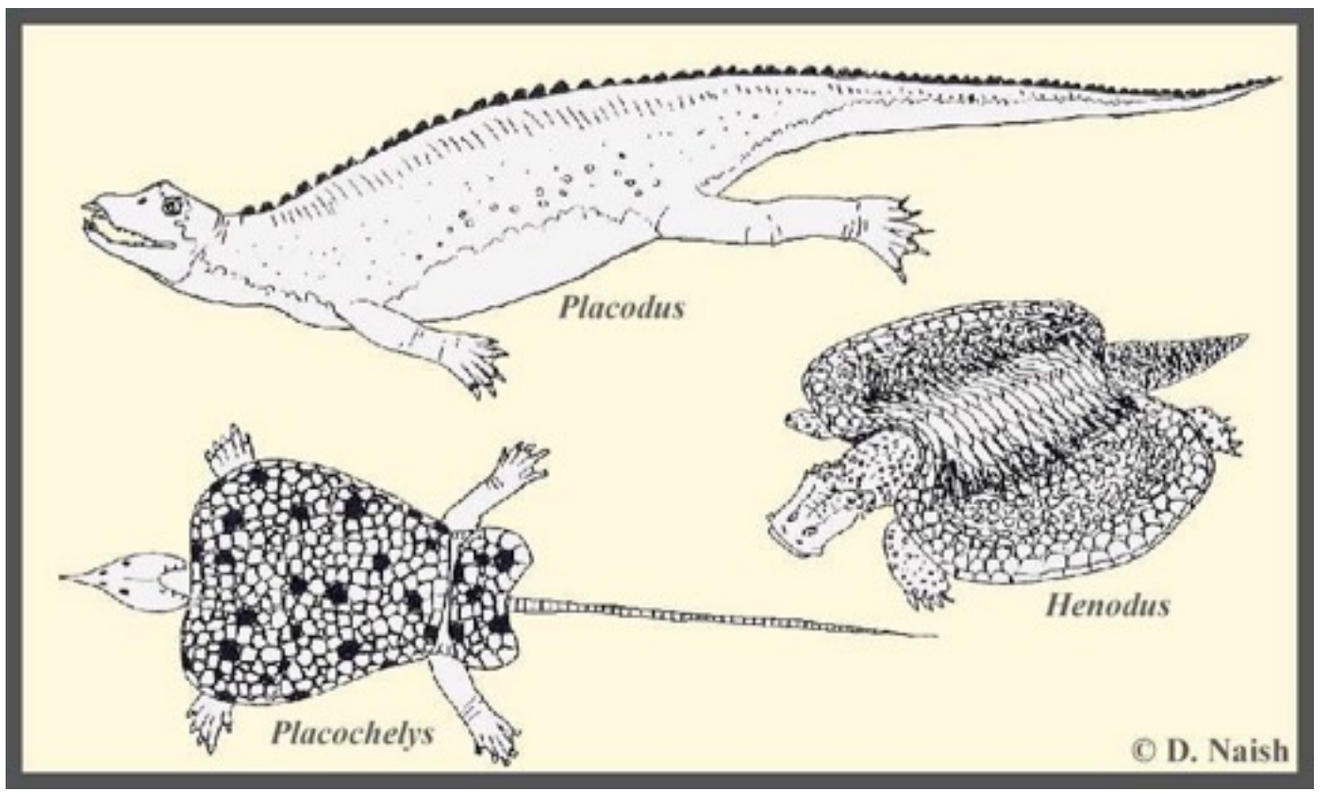
Boxy skull
Tooth comb, crushing teeth
Mollusk-strainer?





Placodonts

2 Major groups:
Placodontoids: unarmored
Cyamodontoids: armored



Nothosaurs

Triassic SEALS

<u>Attributes</u>:

Mid Triassic of Eurasia

Coastal environments

~ 12 ft long as adults

Long neck, streamlined body

Paddlelike forelimbs

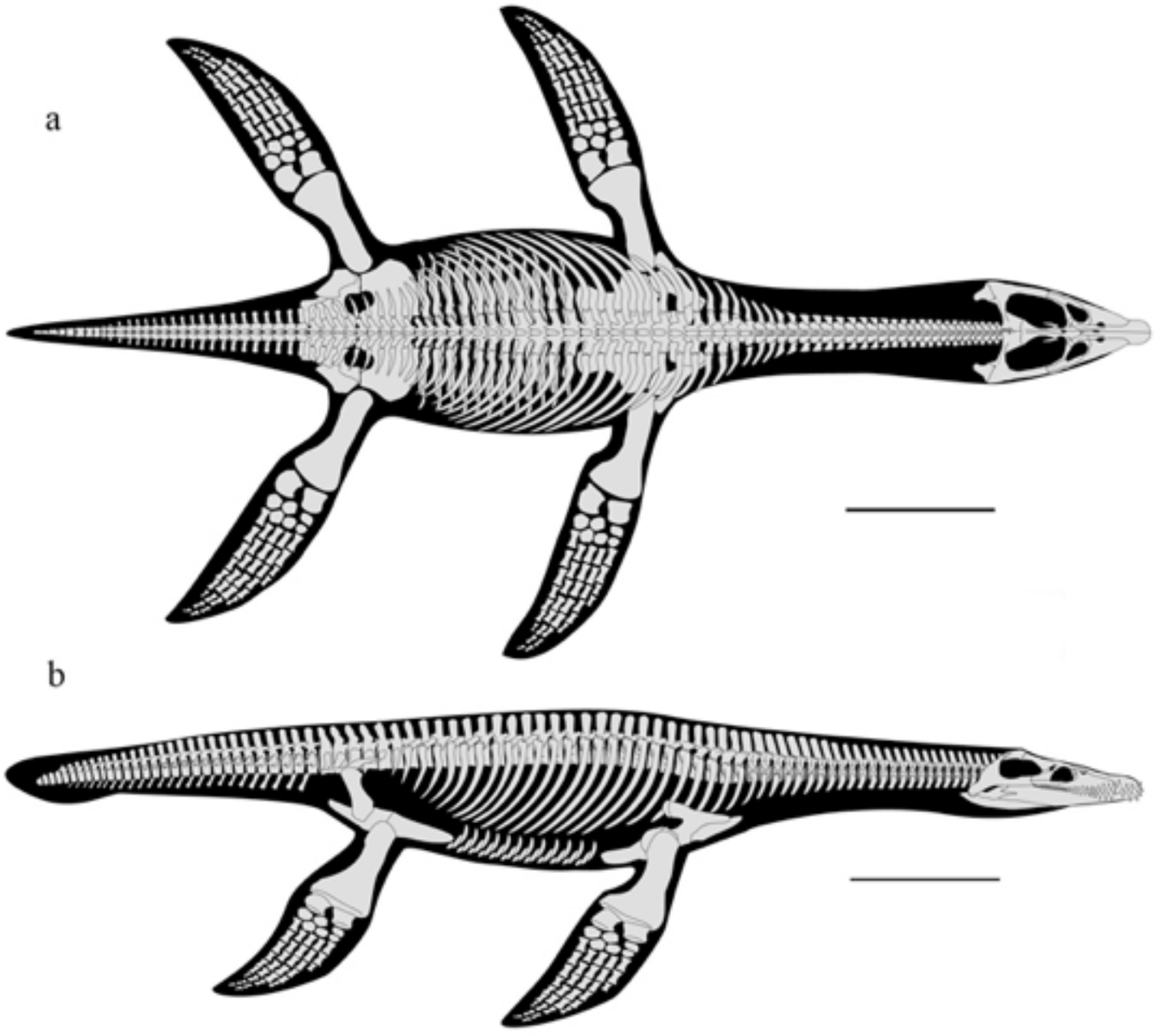
Reduced hindlimbs

Webbed feet

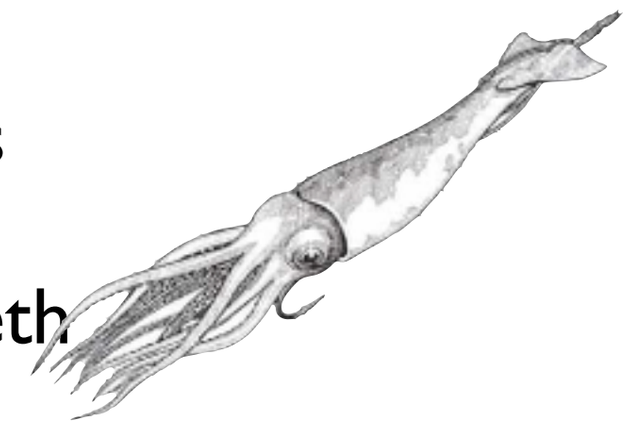
Small pointy teeth

Ceresiosaurus

Plesiosaurs



<u>Attributes</u>:
Early Jurassic to Late Cretaceous
Several Continents
Front and hind limbs modified to flippers
Stiff trunk, strong pectoral and pelvic girdles
Short, boxy body with massive ventral ribs
Long necks, short tails, small head, sharp teeth



Plesiosaurs

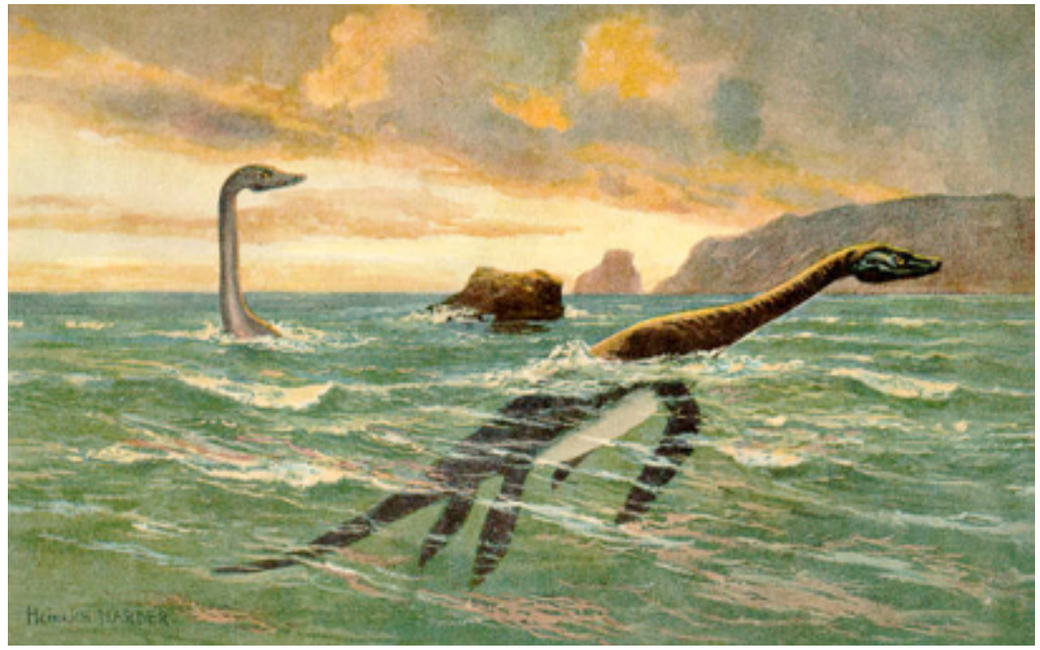
Locomotion

Likely slow swimmers

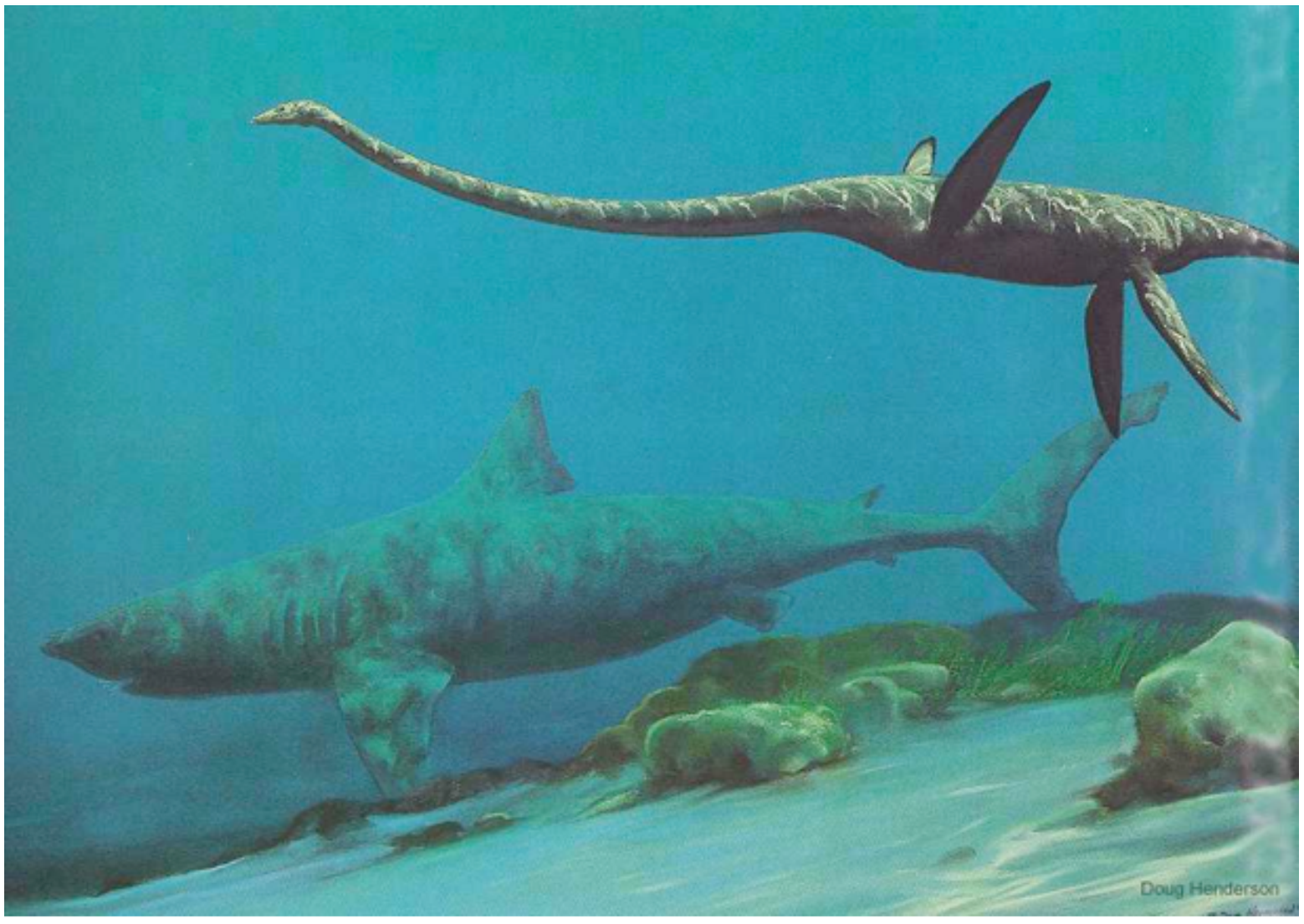
Cruised below the water surface and used long neck to grab prey from below

4-flipper setup would give them an amazing amount of maneuverability

Fins: <u>propulsion</u>



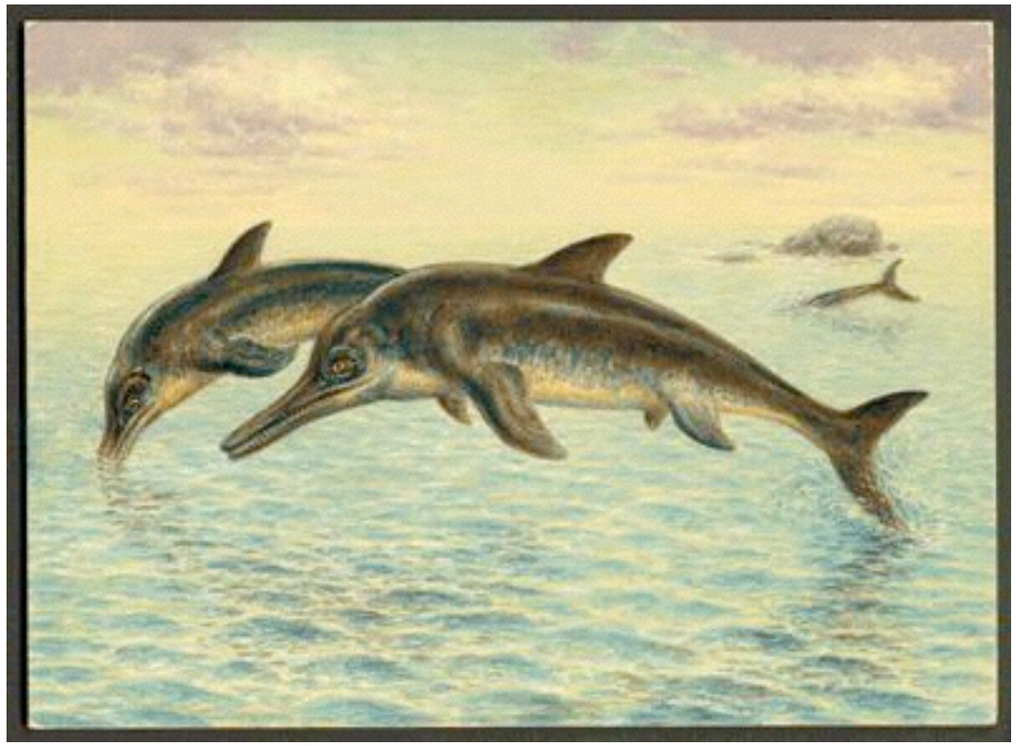
This would have been impossible

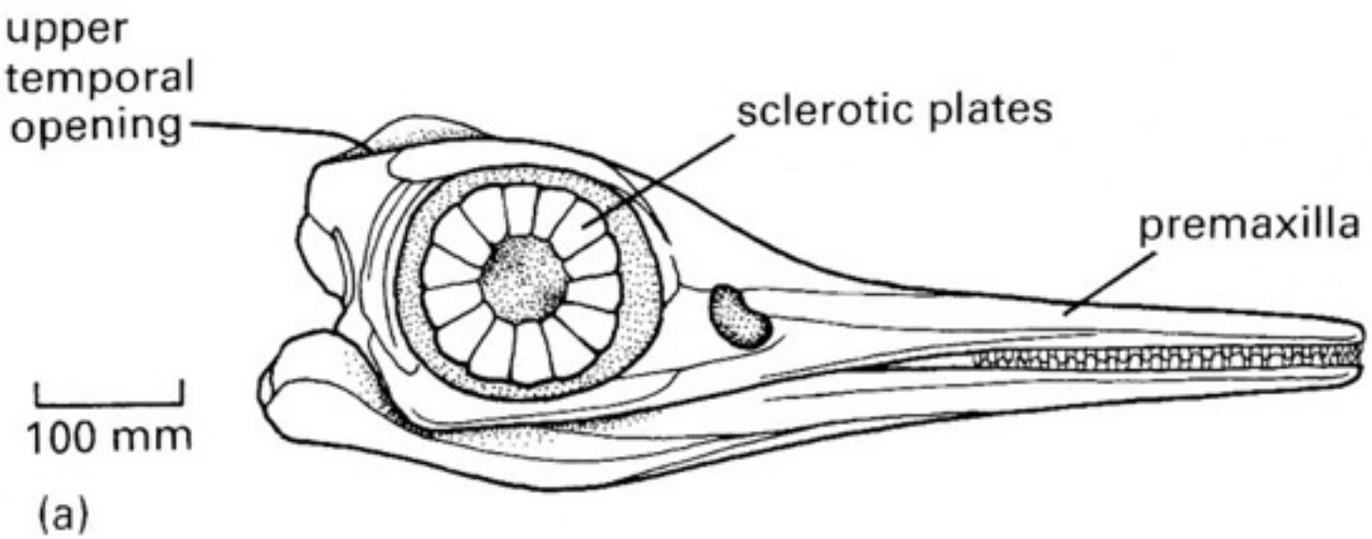


Pliosaurs

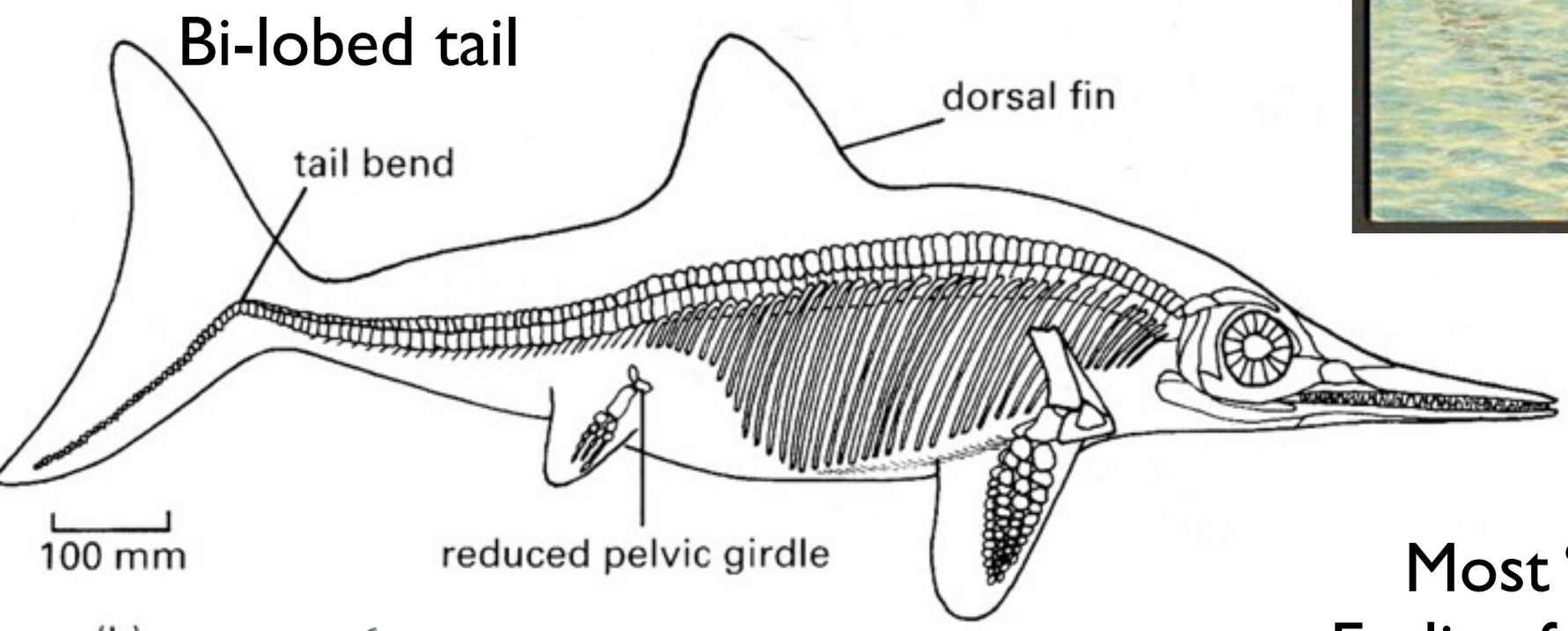
Whales of the Mesozoic!
Up to 40 feet in body length
  The skull was 1/3 of this length!
Large and faster than Plesiosaurs
Large, conical teeth

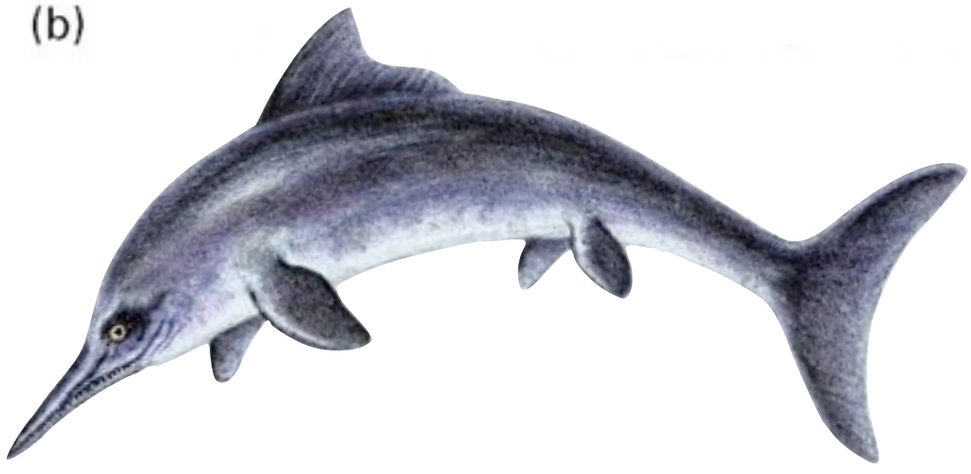
Ichthyosaurs





Bi-lobed tail





<u>Attributes</u>:

Most ‘fish-like’ marine reptile

Earlier forms had longer bodies

Cretaceous forms are more dolphin-like

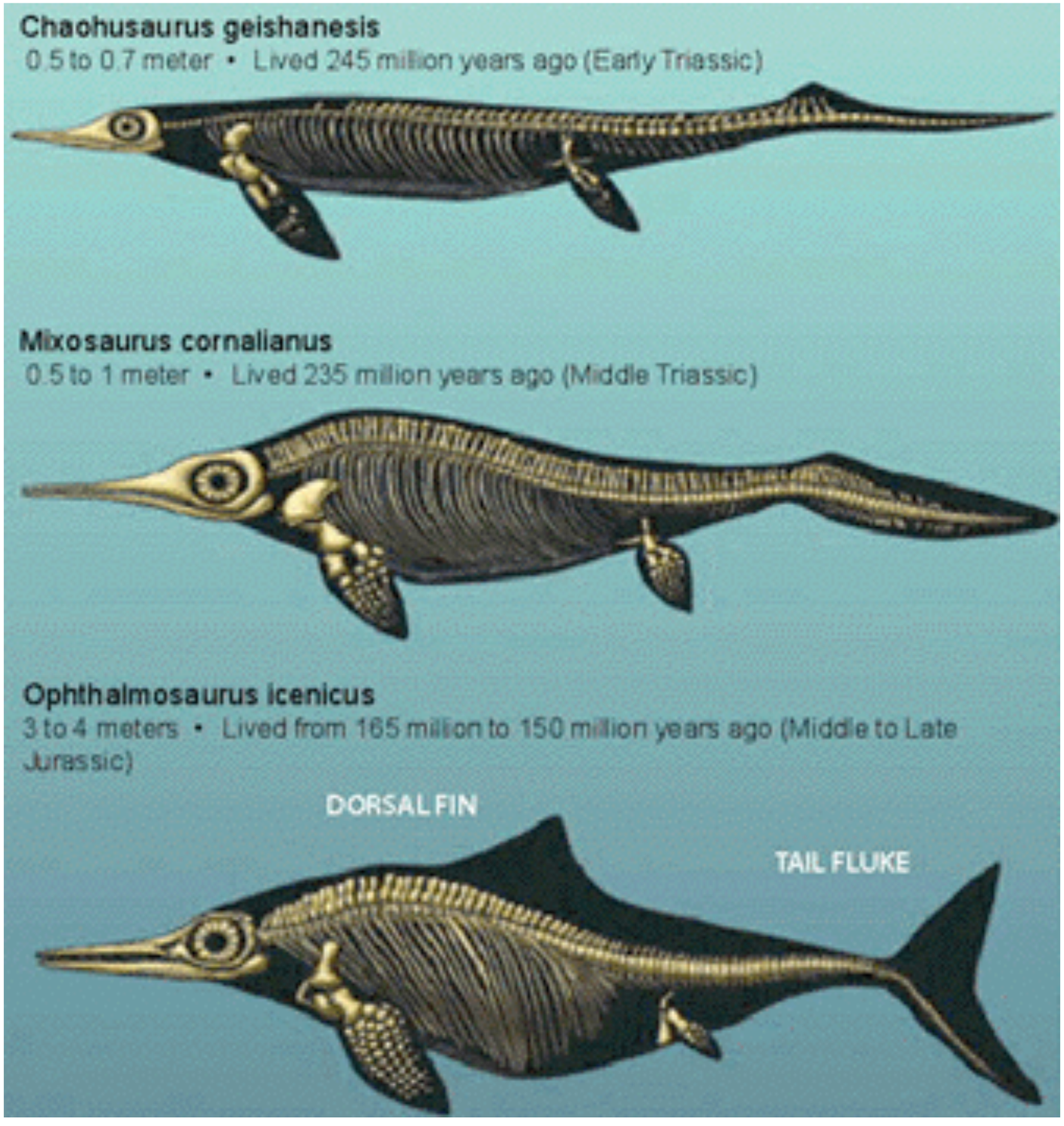
Up to 50 ft in length!

Forelimbs modified into flippers

Reduced hindlimbs, reduced pelvic girdle

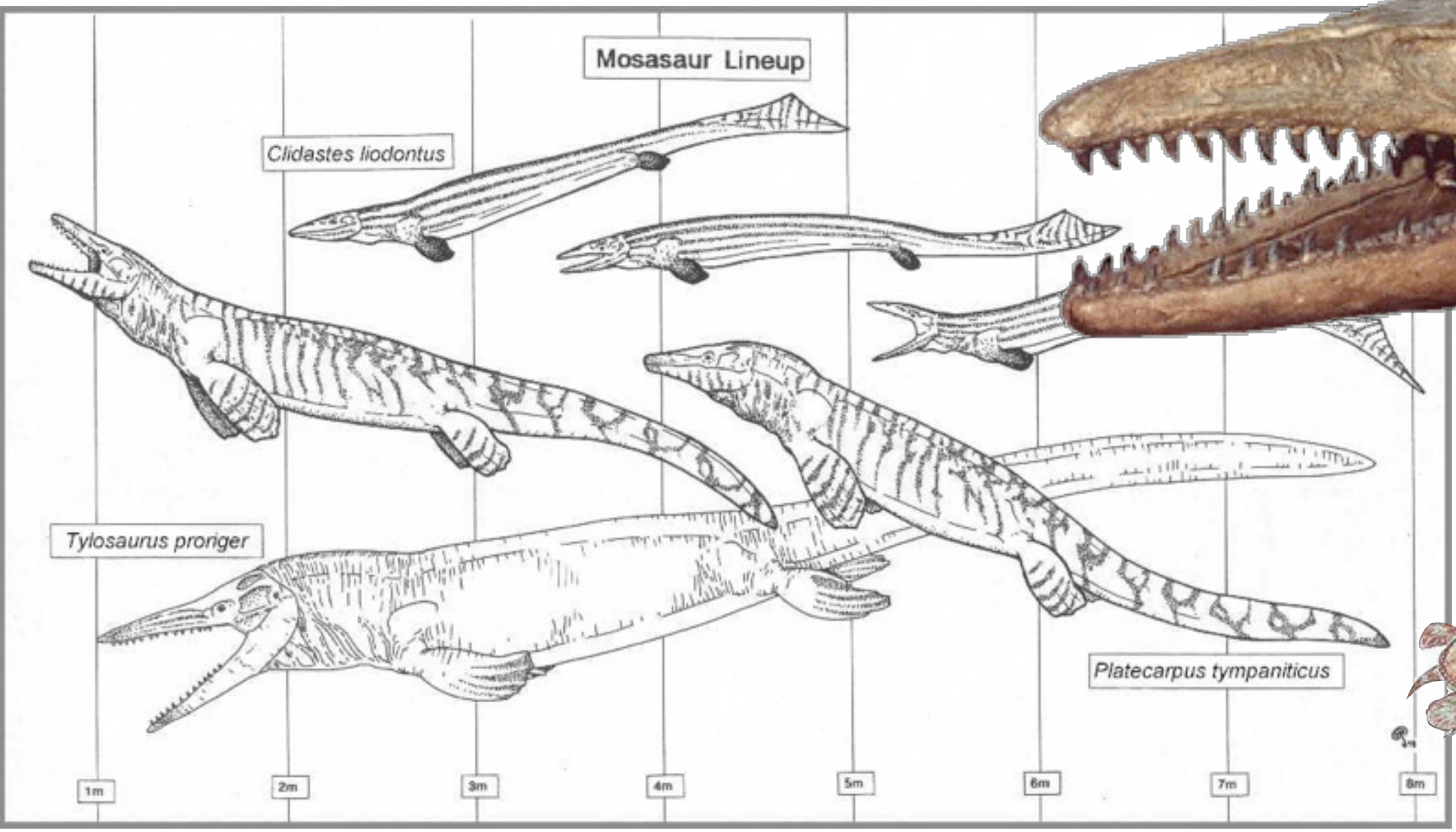
Ventrally-tipped tail and dorsal fin

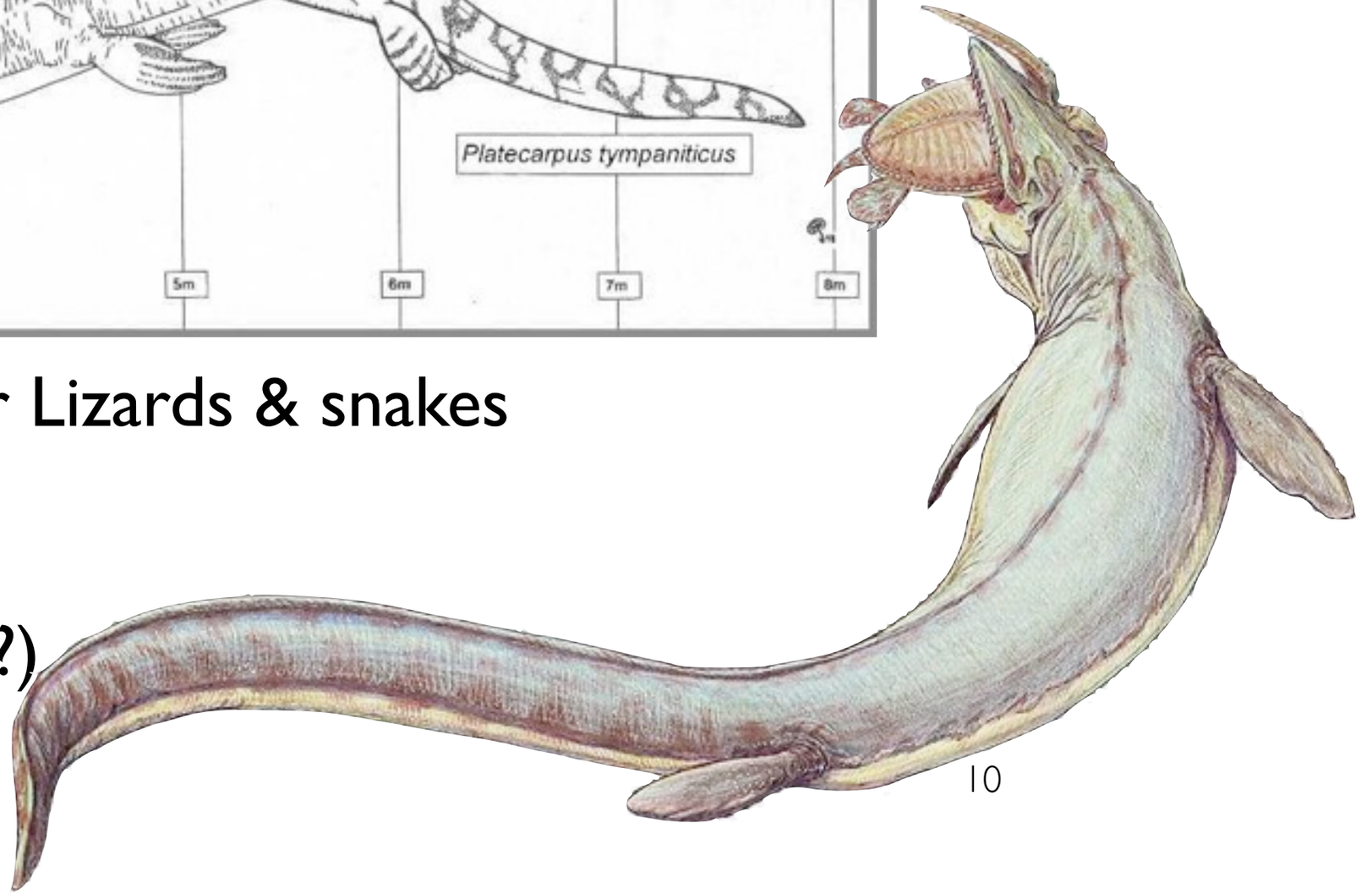
Ichthyosaurs



Early Triassic to Mid Cretaceous

Mosasaurs!

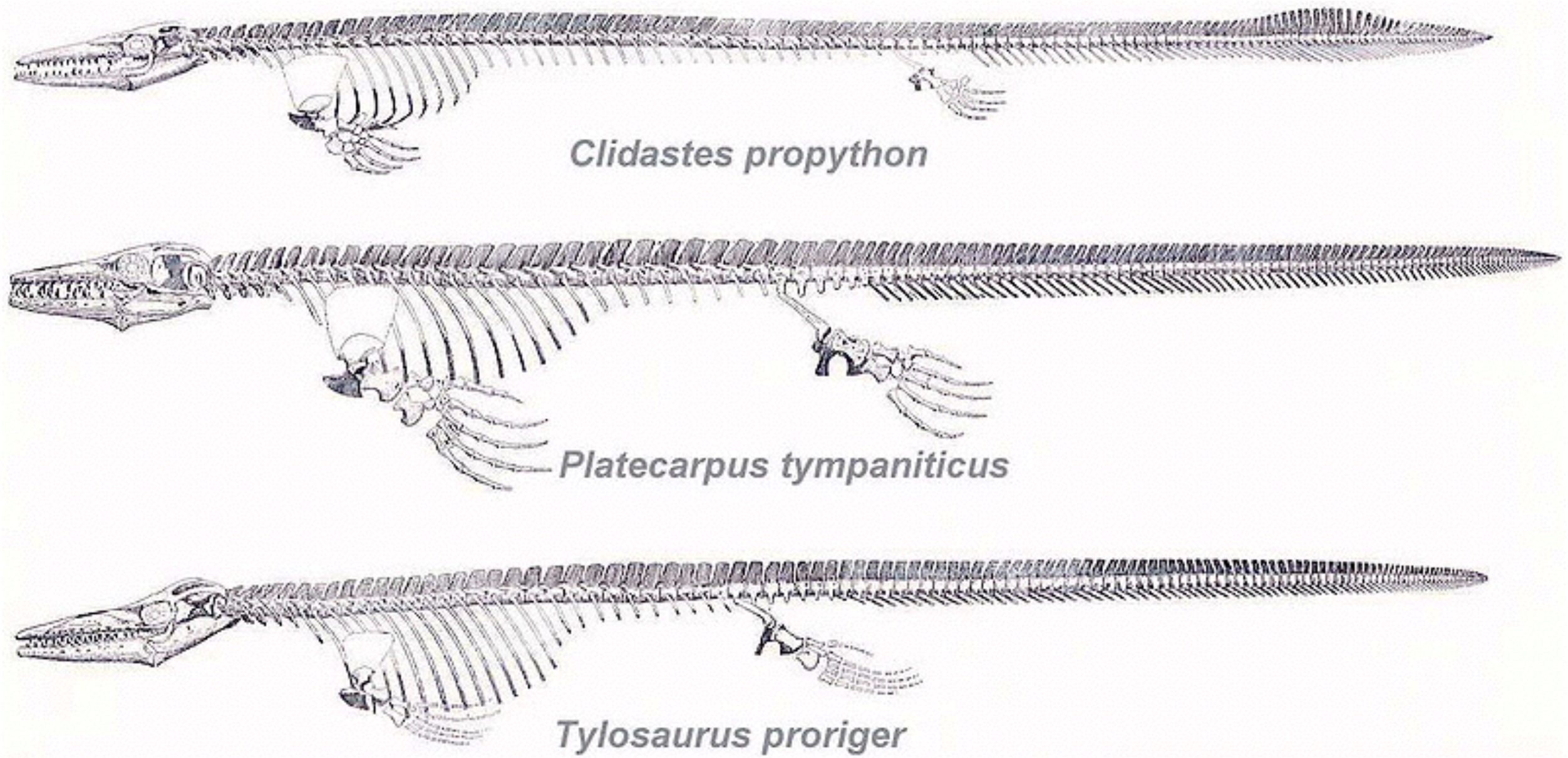


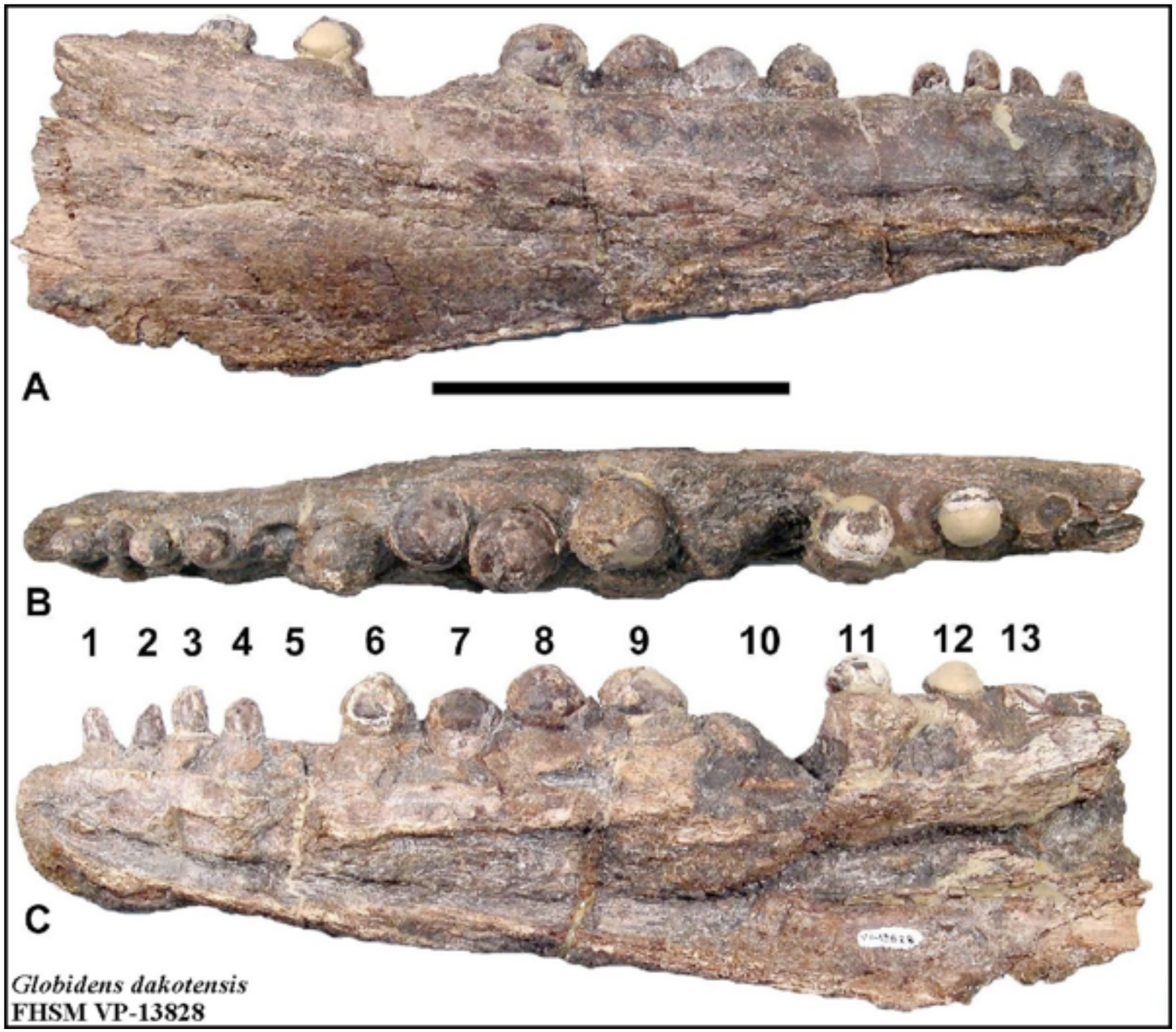


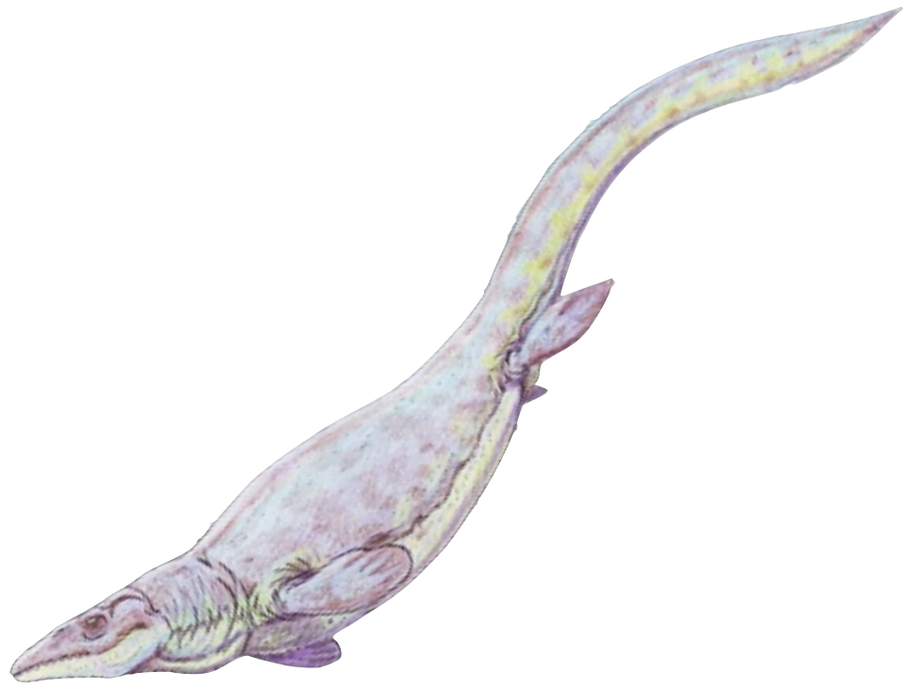
Closely related to Monitor Lizards & snakes
5 to 45 feet long
Long and slender
Blunt snouts (for ramming?)
Large eyes, stout teeth
APEX predator

Mosasaurs!

Early to late Cretaceous
Superseded Ichthyosaurs and Pliosaurs as the dominant Apex Predators



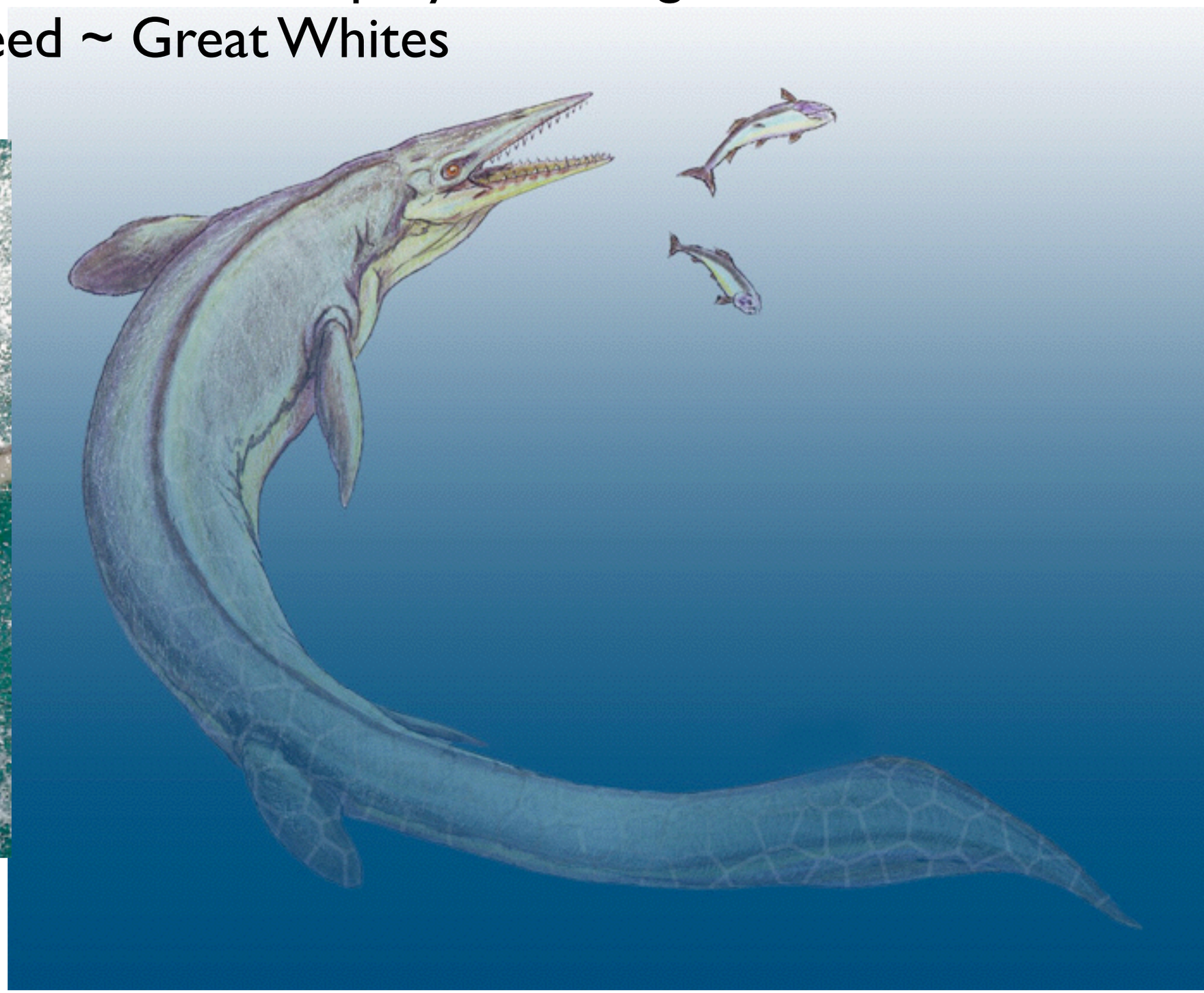




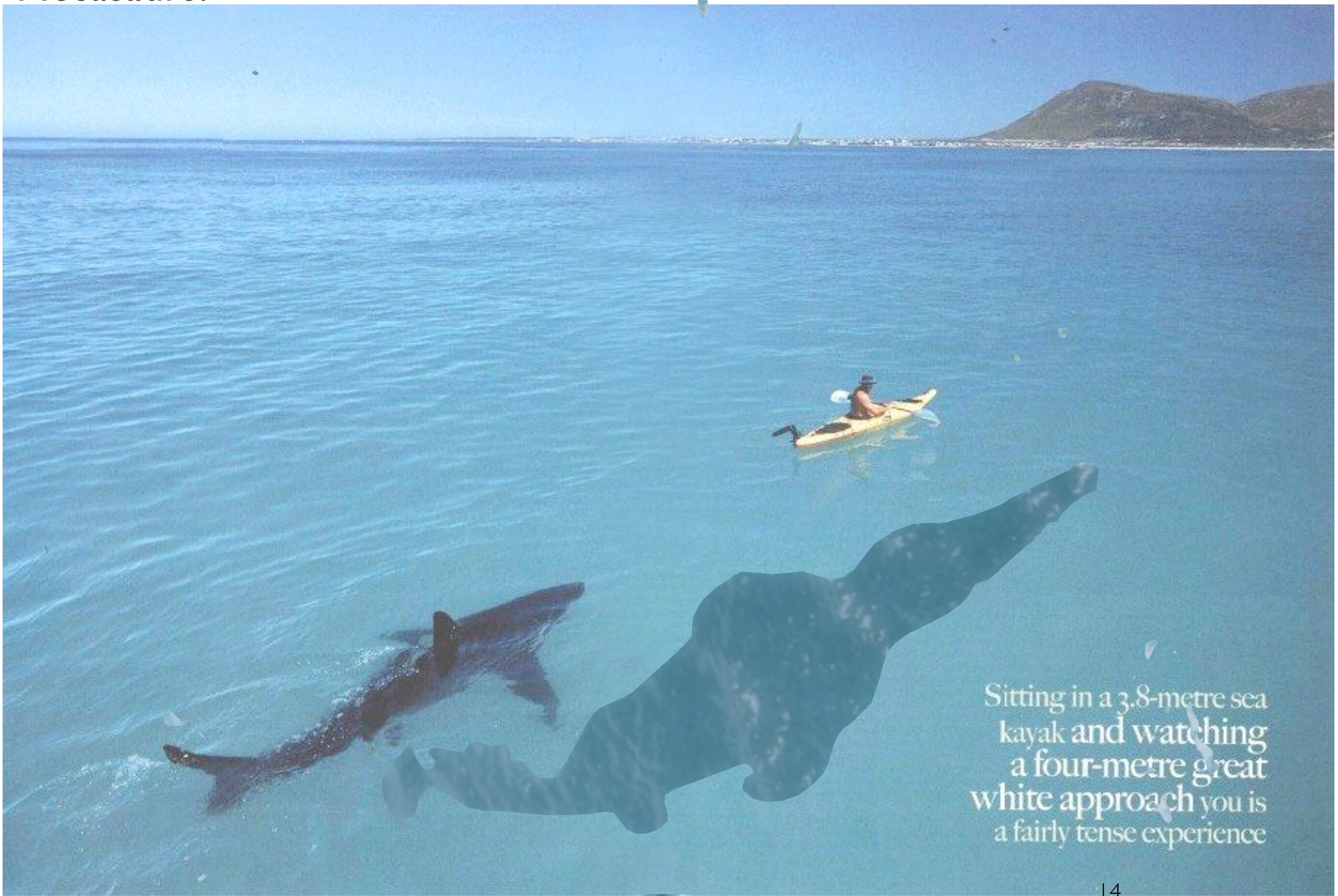
Carinodens & *Globidens*: smallest, earliest mosasaurs (11 ft)
Likely ate mollusks, small to medium arthropods
~ Shell crackers (blunt teeth)

Mosasaurs!

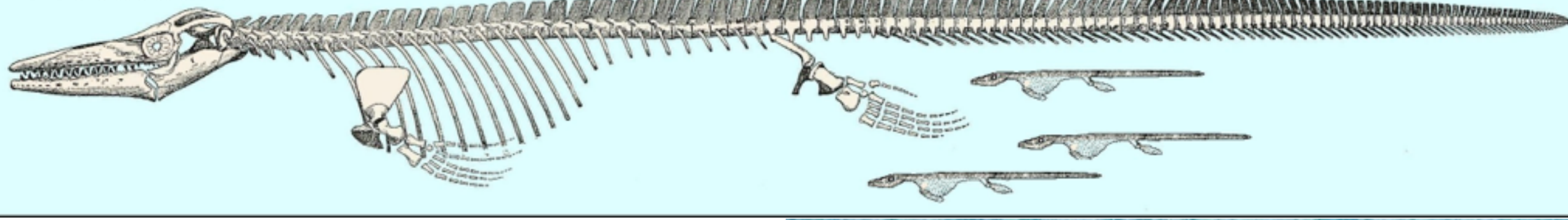
It's body plan suggests that it stalked prey, attacking in short, powerful bursts of speed ~ Great Whites



Mosasaurs!


Sitting in a 3.8-metre sea
kayak and watching
a four-metre great
white approach you is
a fairly tense experience

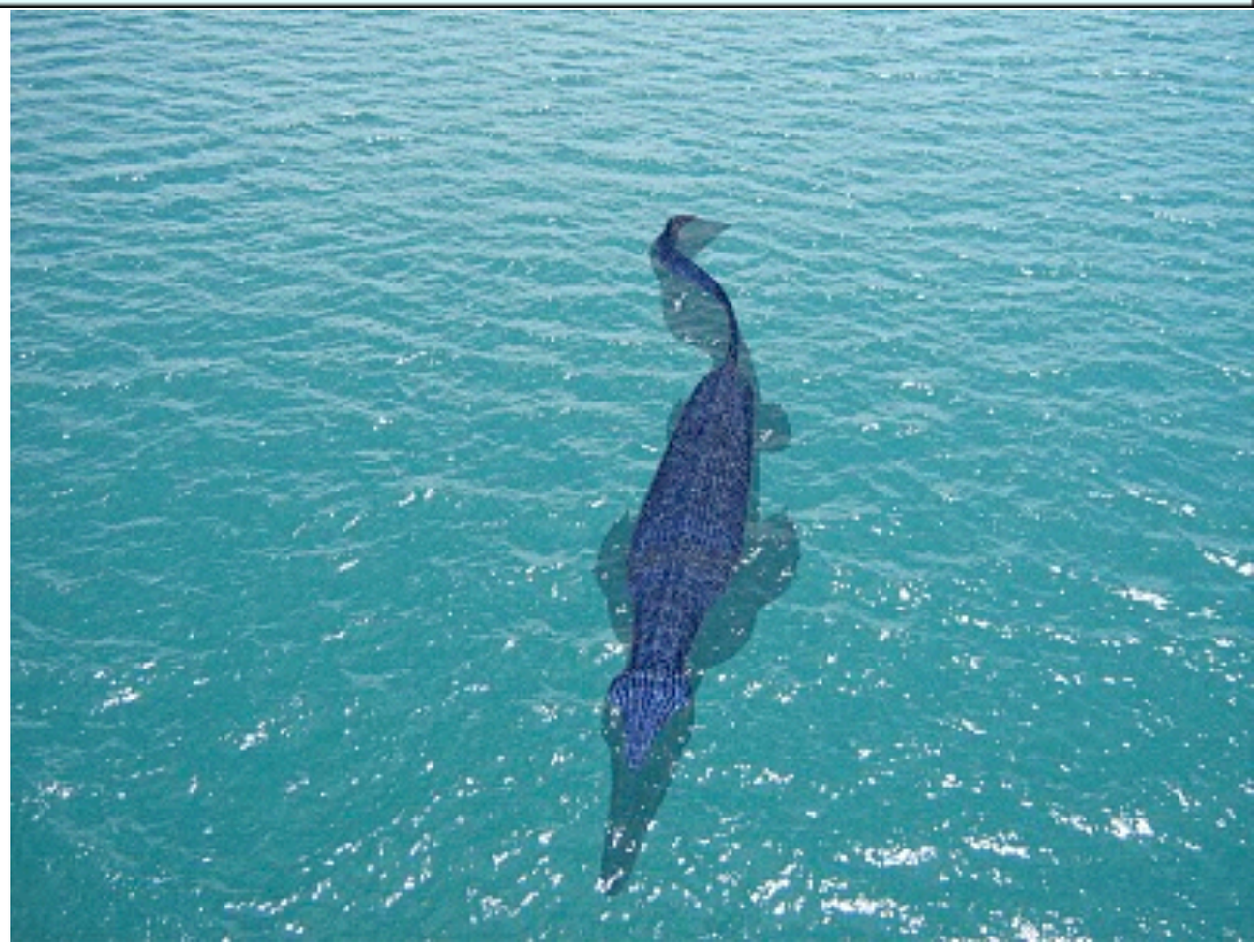
Mosasaurs!

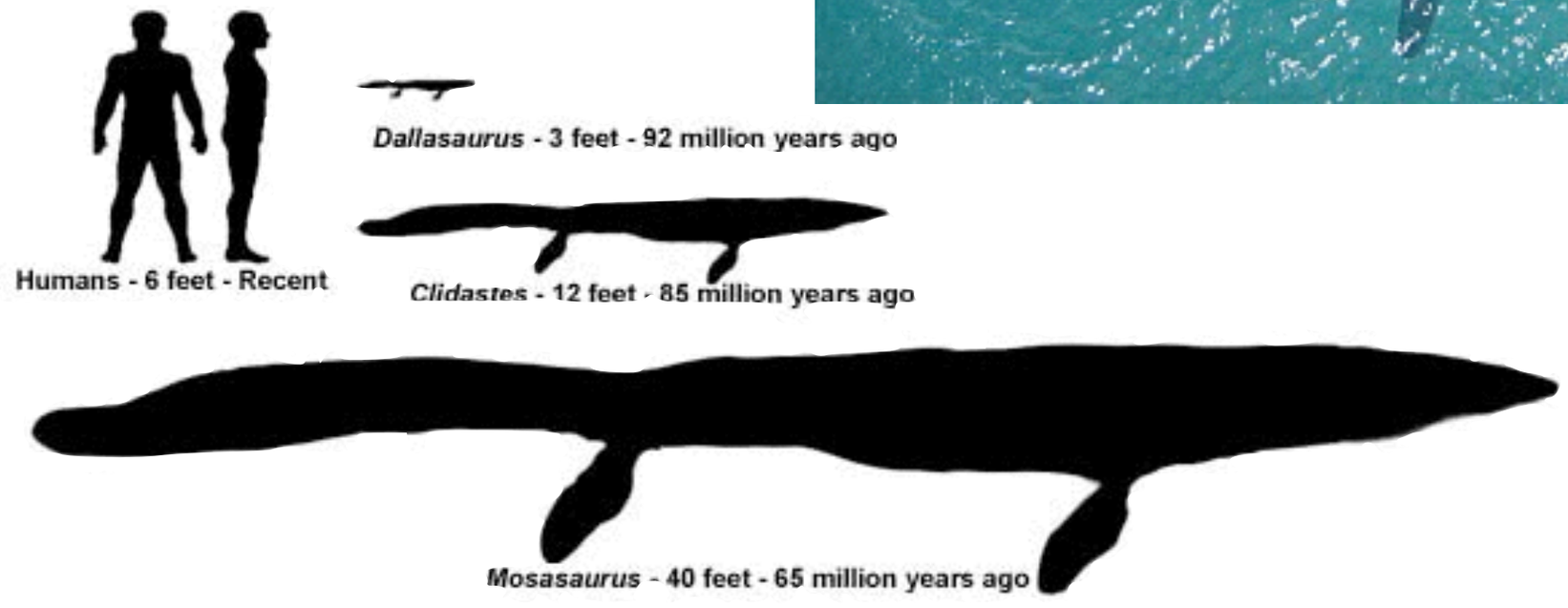


Derived Mosasaurs had double-hinged jaws ~ allowed them to swallow prey whole

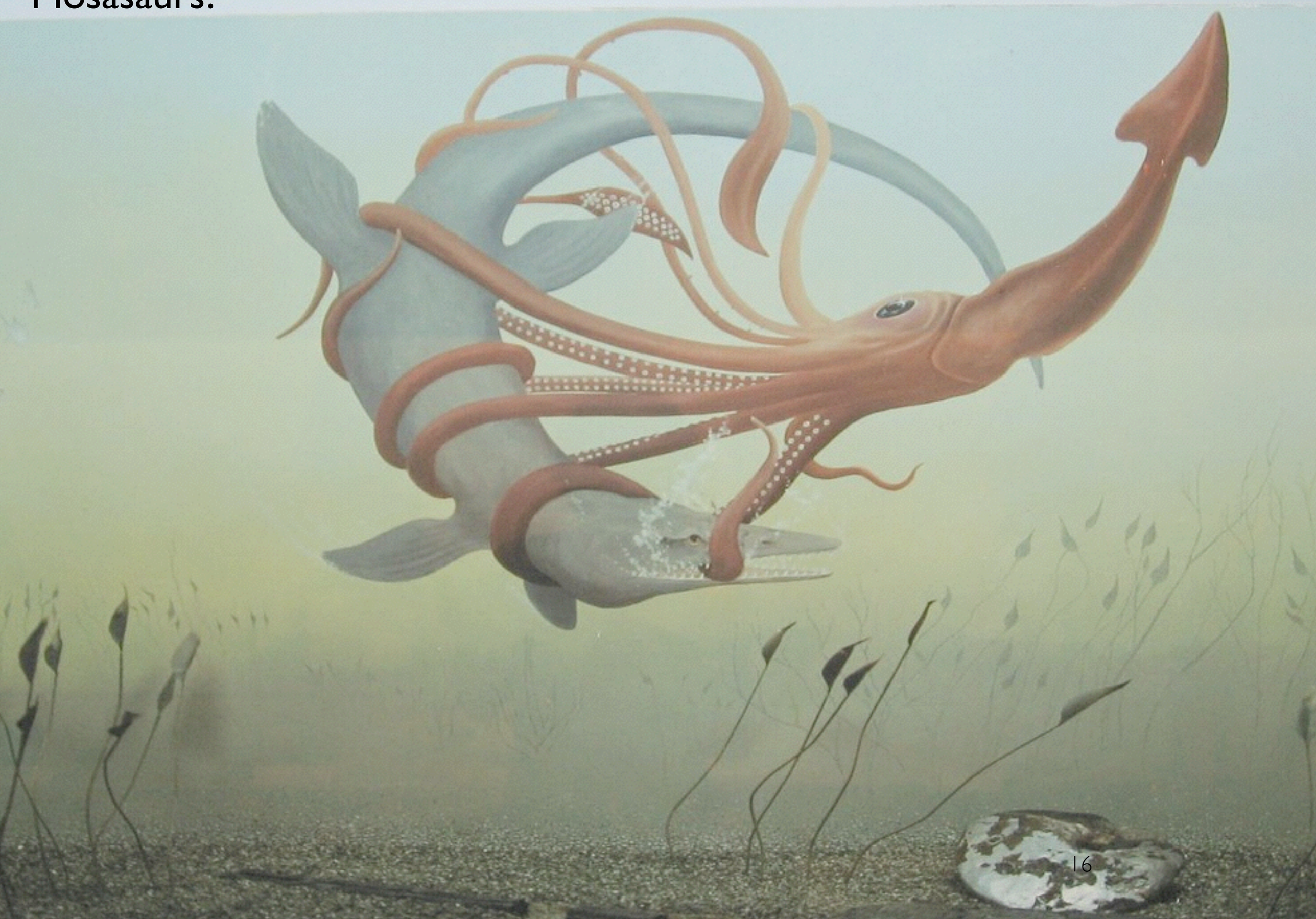
Mosasaurs have been found with large sharks in their 'stomachs'

Covered in overlapping scales; keeled scales on the upper body and smooth scales on the lower body





Mosasaurs!

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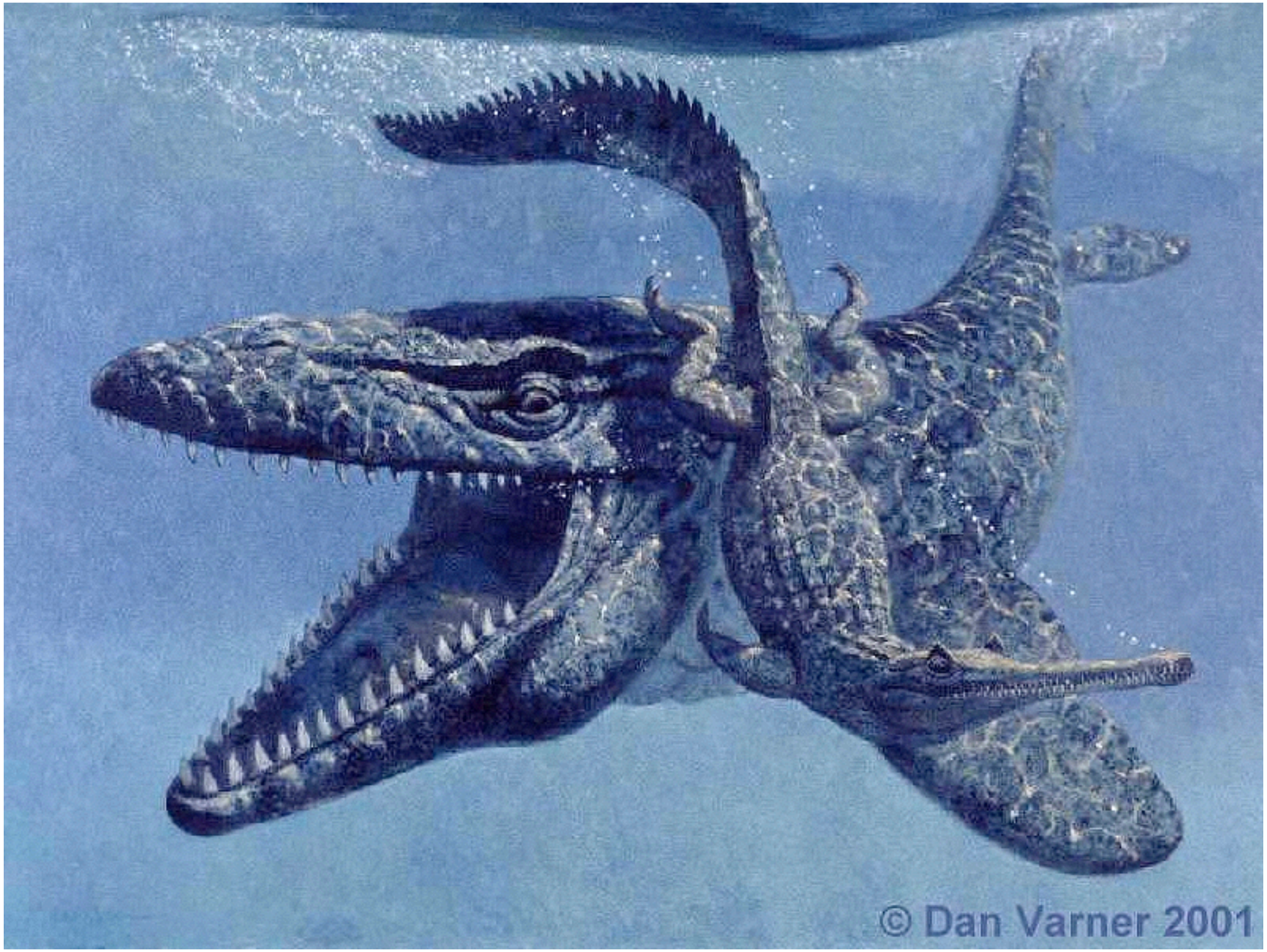
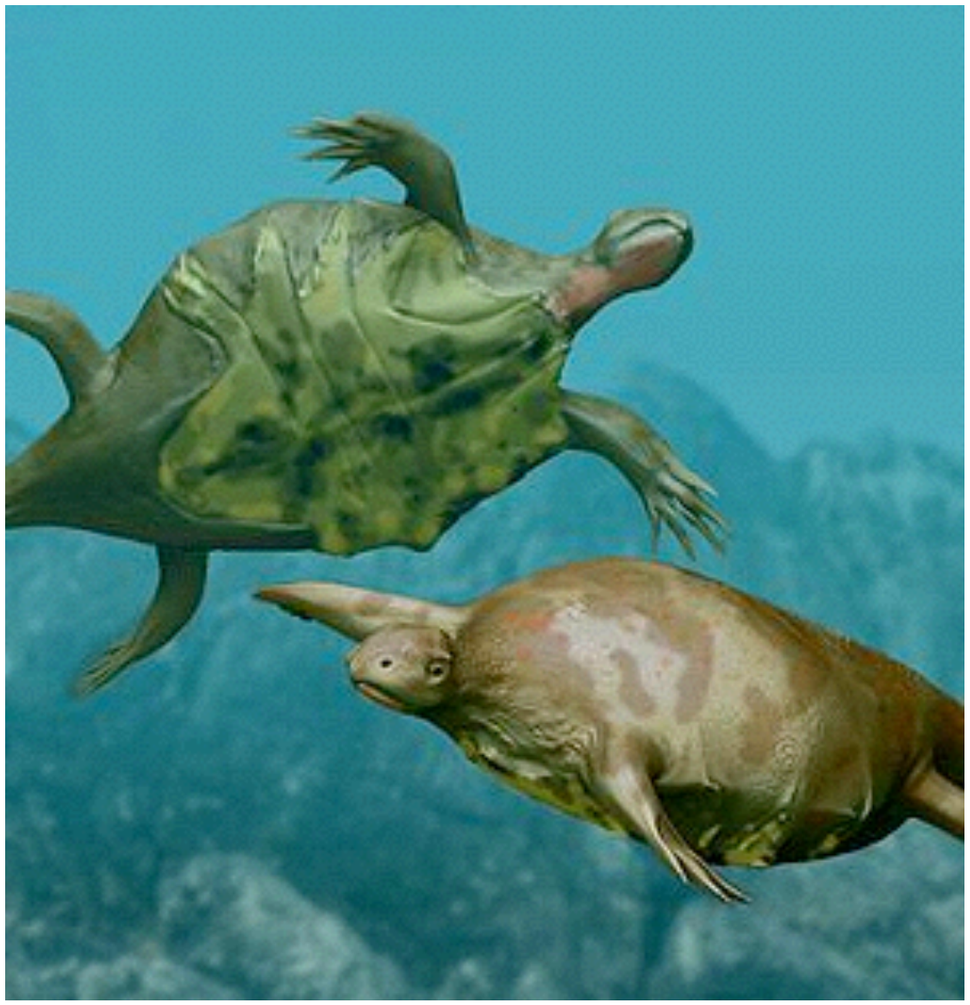
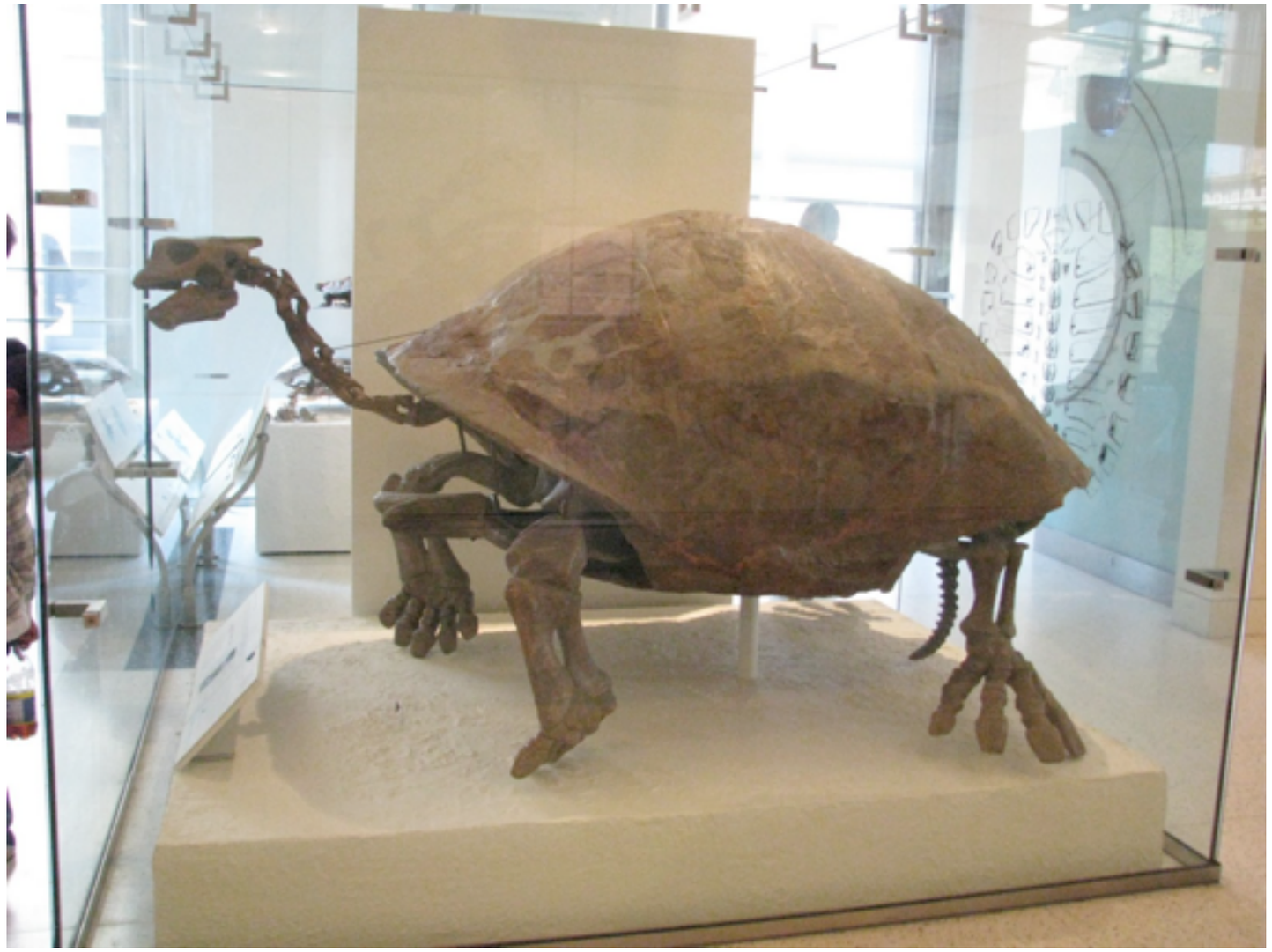
Turtles & Crocodiles

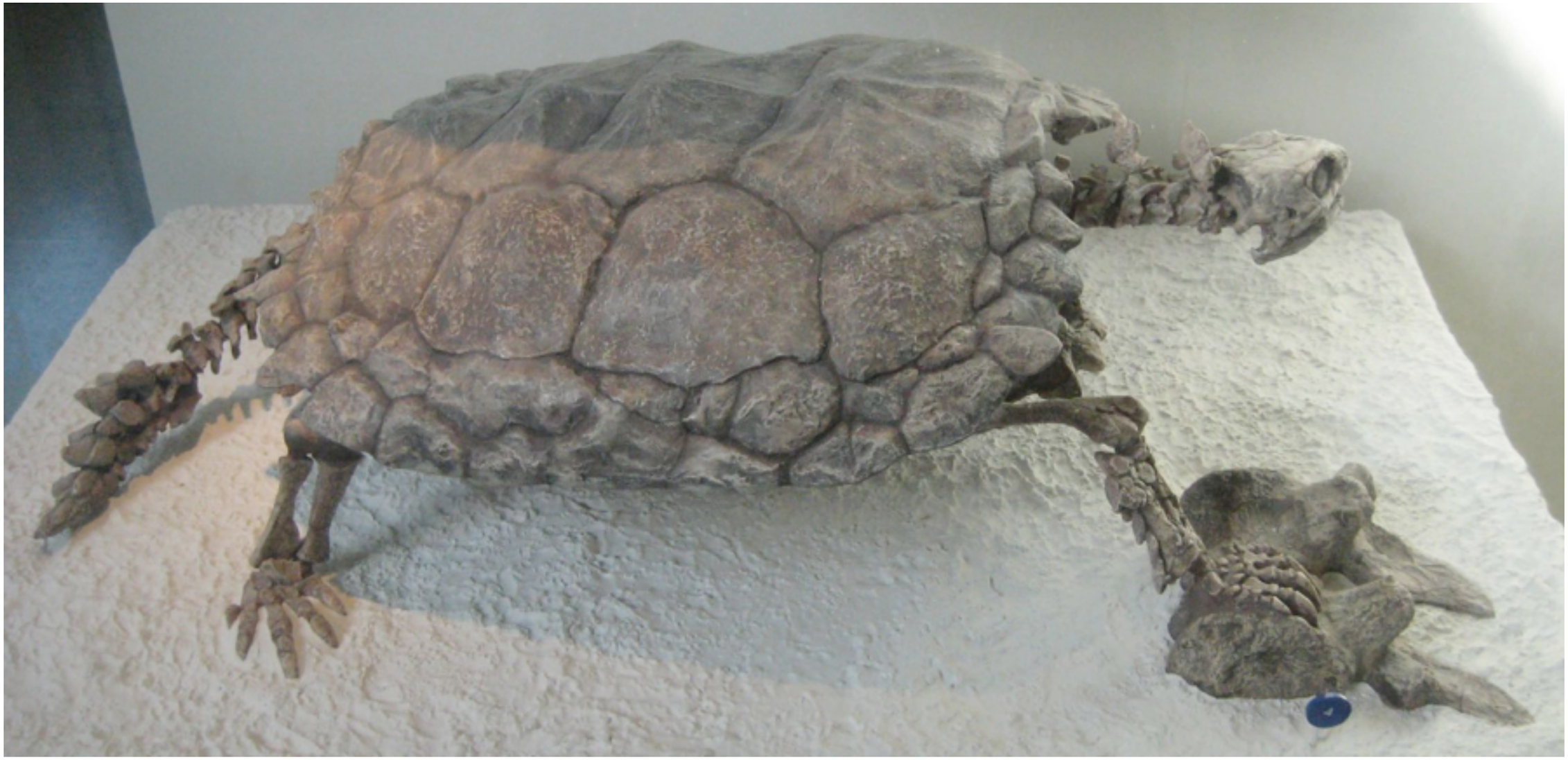


Turtles
Triassic - Present





Odontochelys
Had teeth
Aquatic
Did not yet have a solid carapace, as do modern turtles

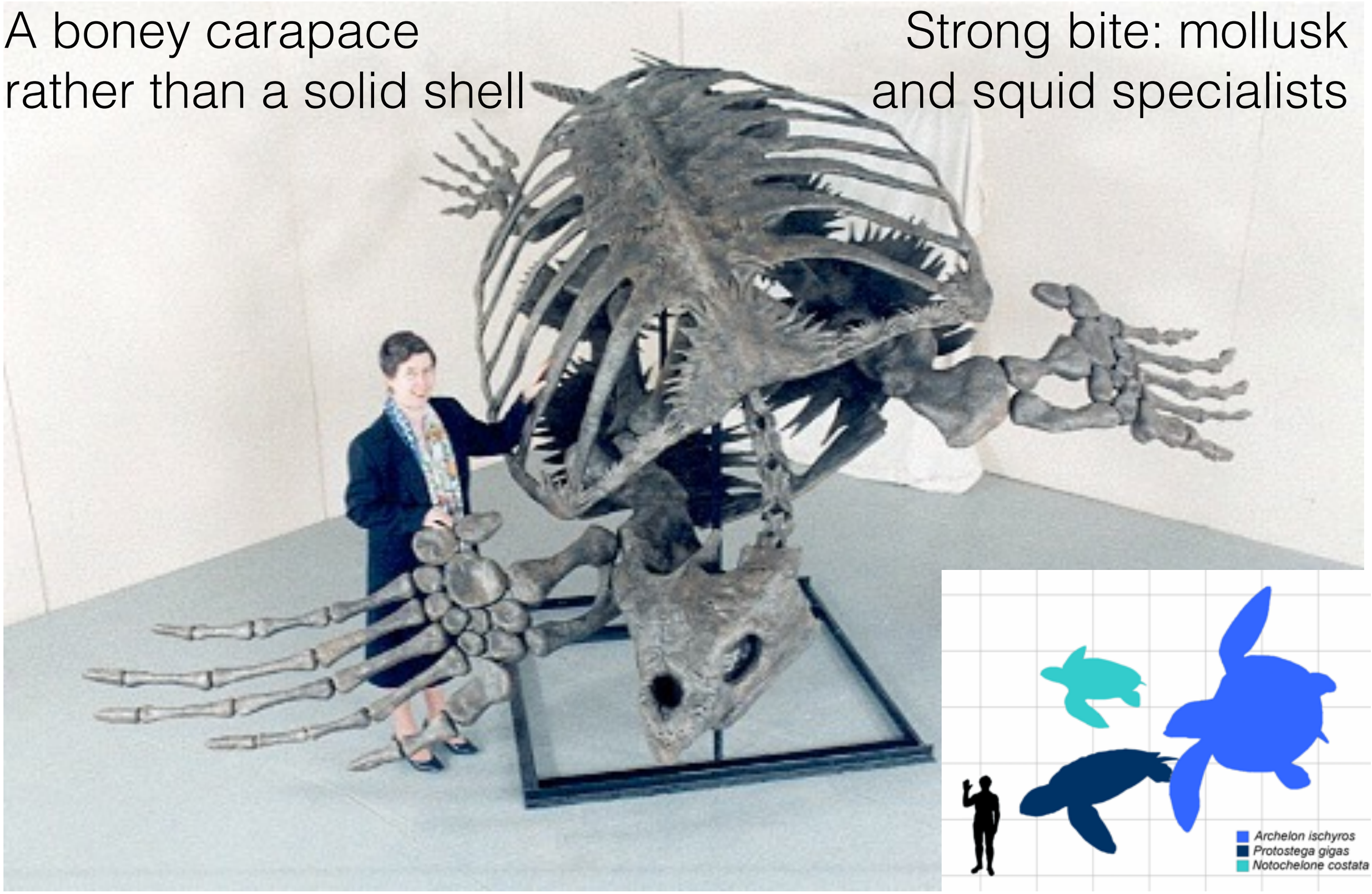


Proganochelys

First fully shelled turtle, Late Triassic

A boney carapace
rather than a solid shell

Strong bite: mollusk
and squid specialists

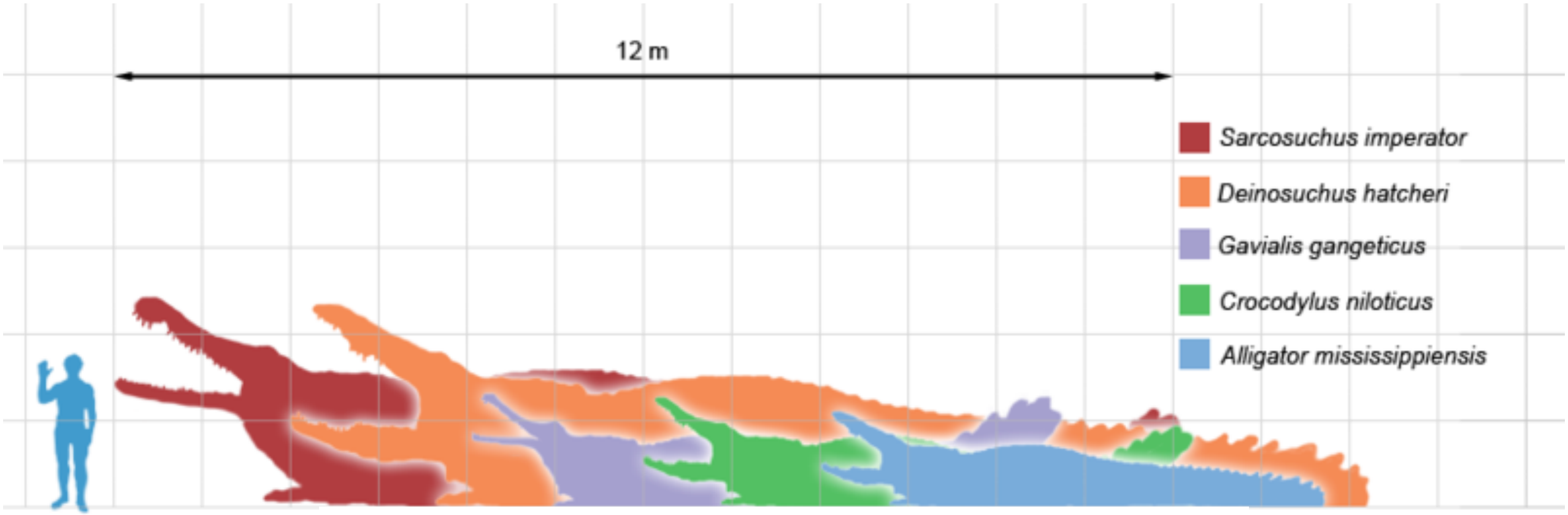


Archelon (late Cretaceous)

True Crocodiles:
Late Cretaceous to present

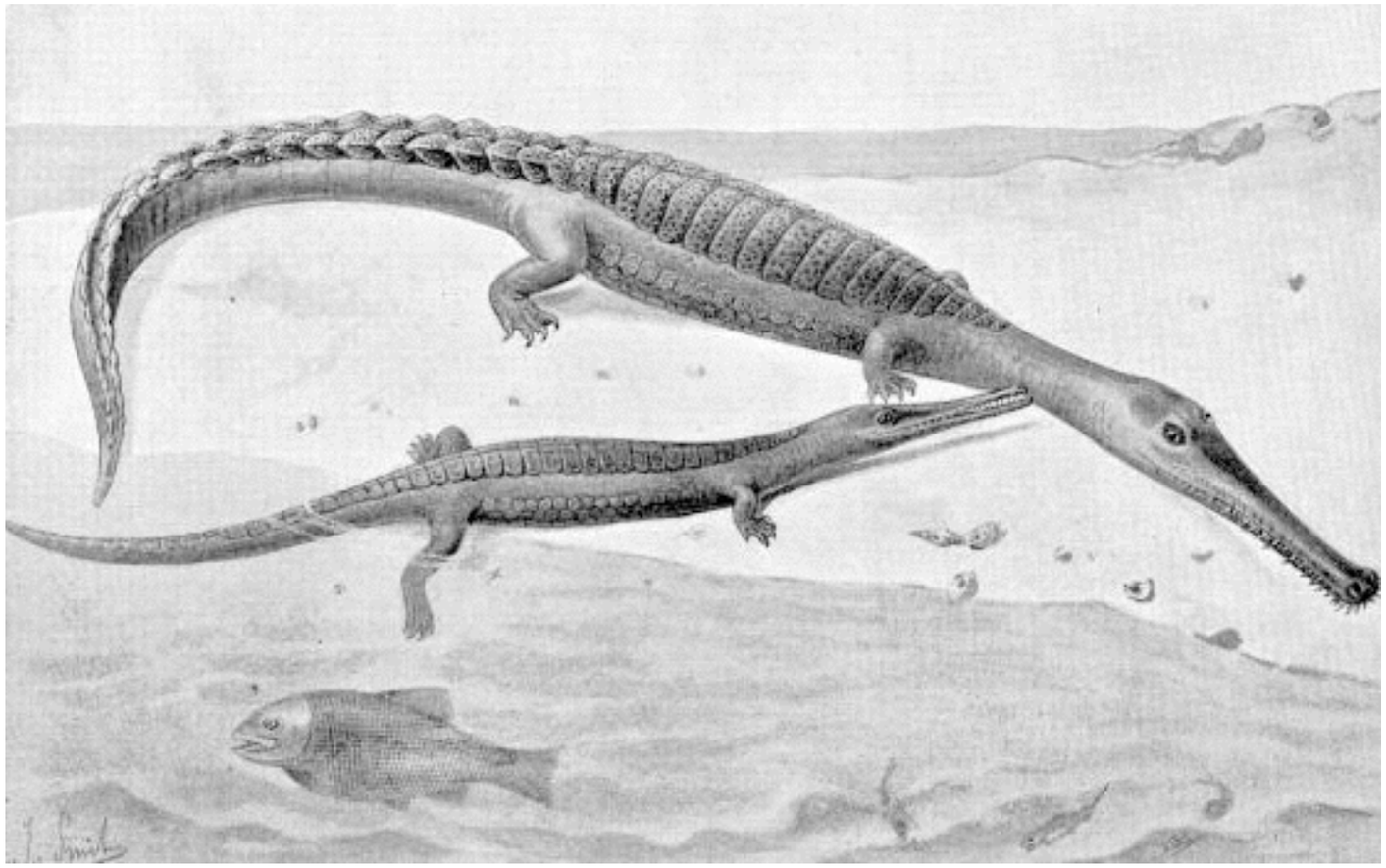
Crocodylomorpha (Archosaurs)
mid-Triassic to present

<u>Marine Crocs:</u>
Teleosaurids
Metriorynchids



<u>Teleosaurid Crocs</u>
Early Jurassic to Early Cretaceous
Long snouts (Piscivores)
Very crocodile-like
Worldwide distribution

Mystriosuchus



Teleosaurus

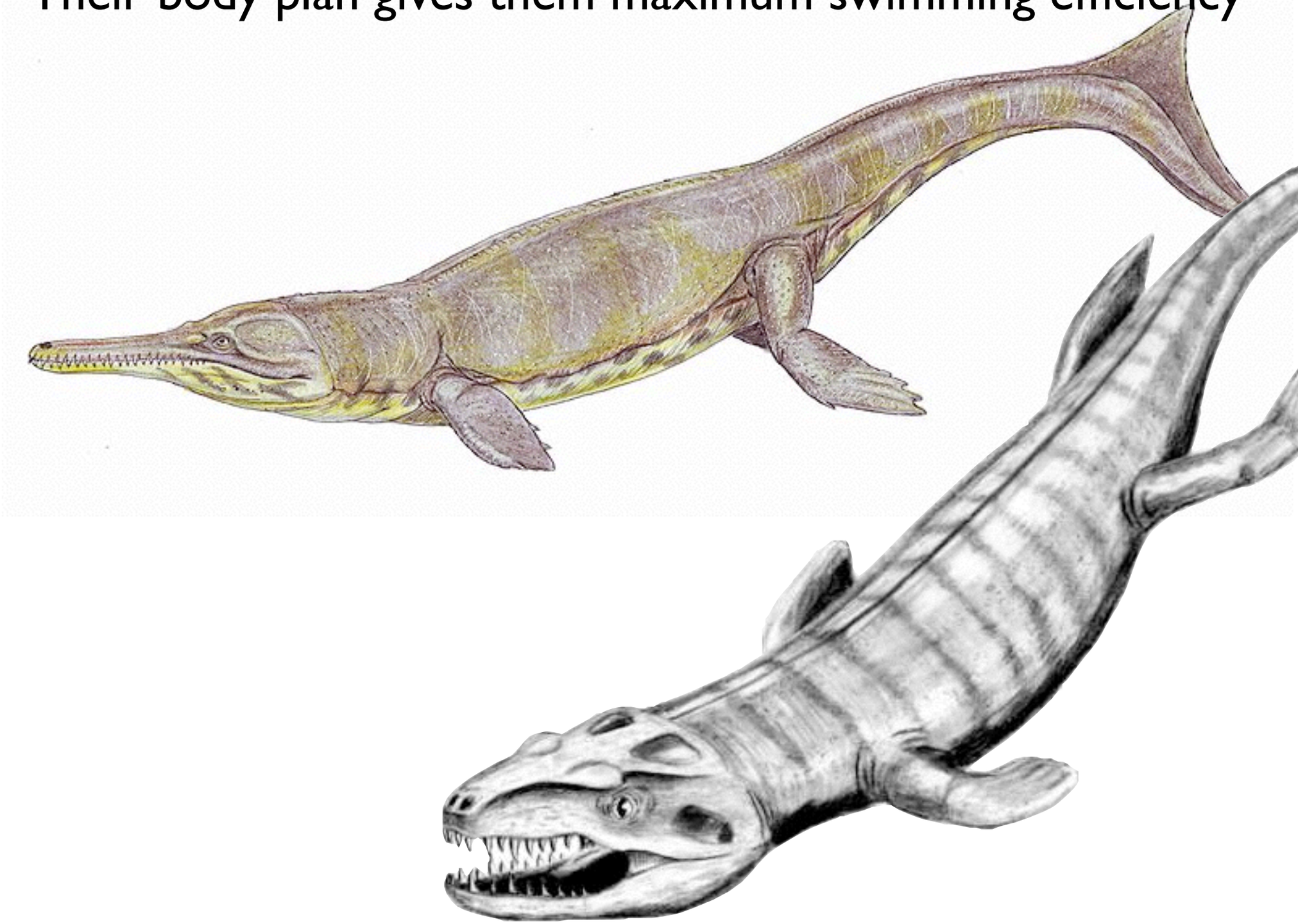
<u>Metriorynchid Crocs</u>

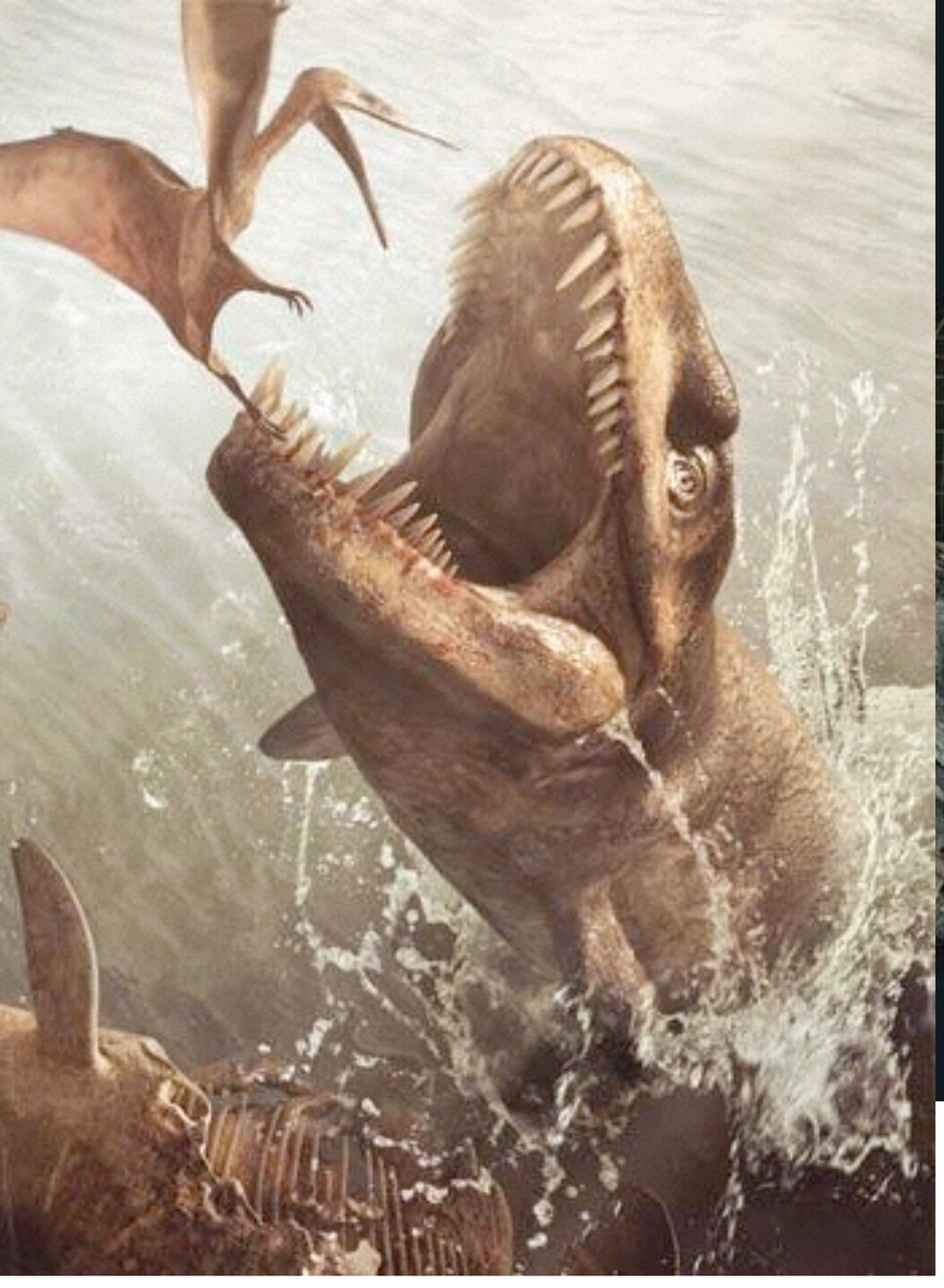
Mid Jurassic to Early Cretaceous

Fully aquatic- evolved fish-like fins

Lost their osteoderms

Their body plan gives them maximum swimming efficiency





Dakosaurus

Flattened, serrated teeth
Teeth analogous to Killer Whales
Had salt glands in skull to deal with ocean water

From the oceans to freshwater habitats