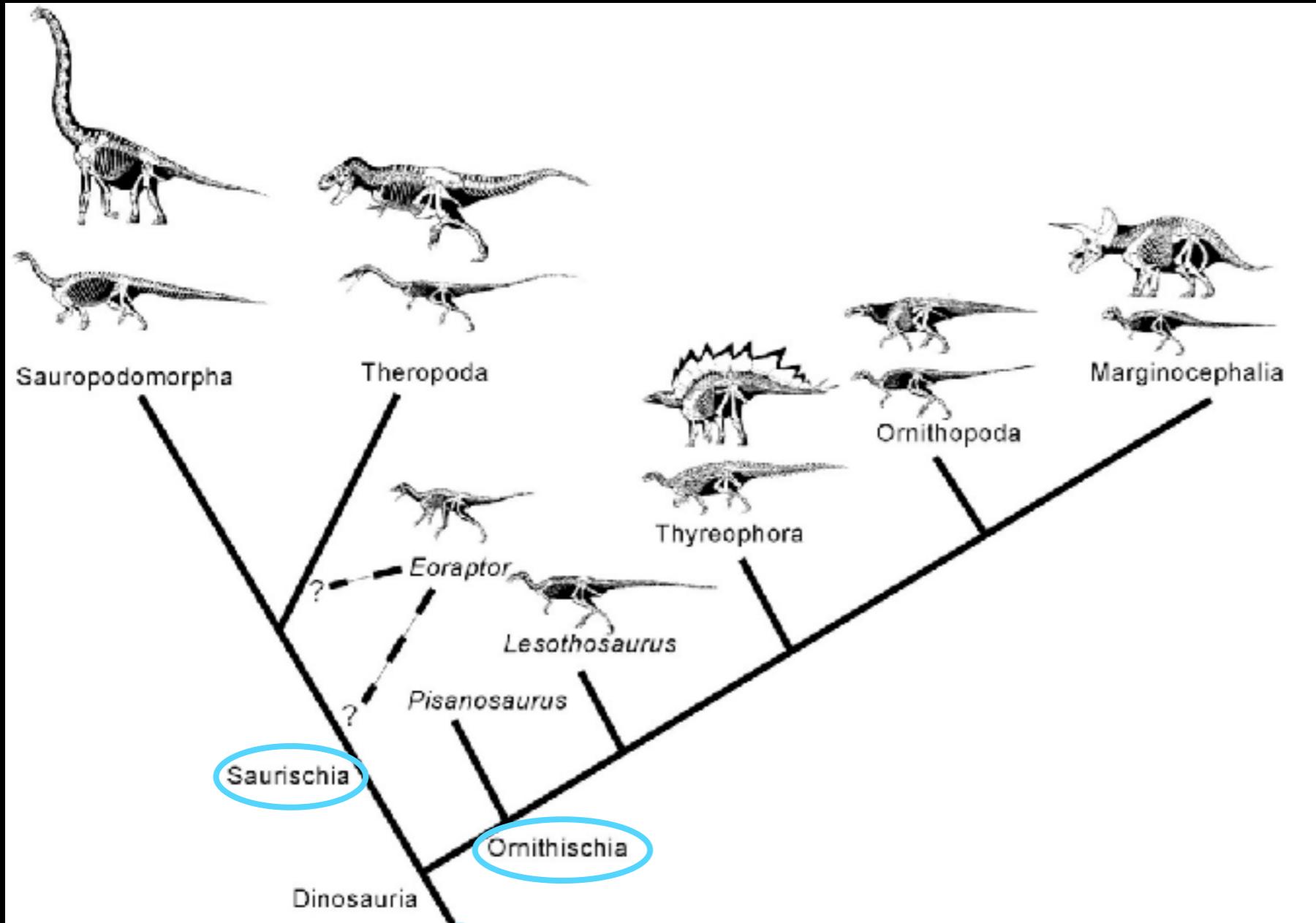


Exam 1 will cover:

Chapter 10: The shield-bearers

DINOSAURS

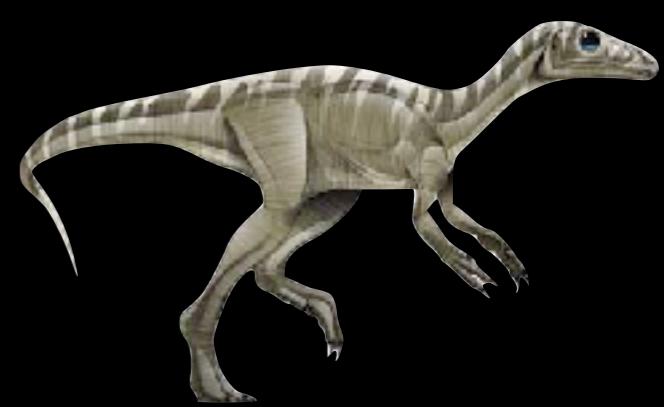
Basal Dinosaurs



Lesothosaurus



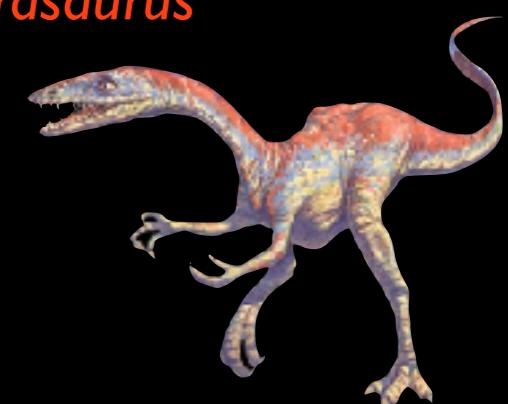
Pisanosaurus



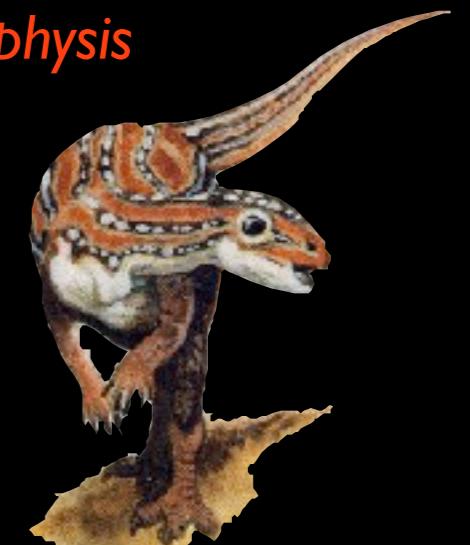
Eoraptor



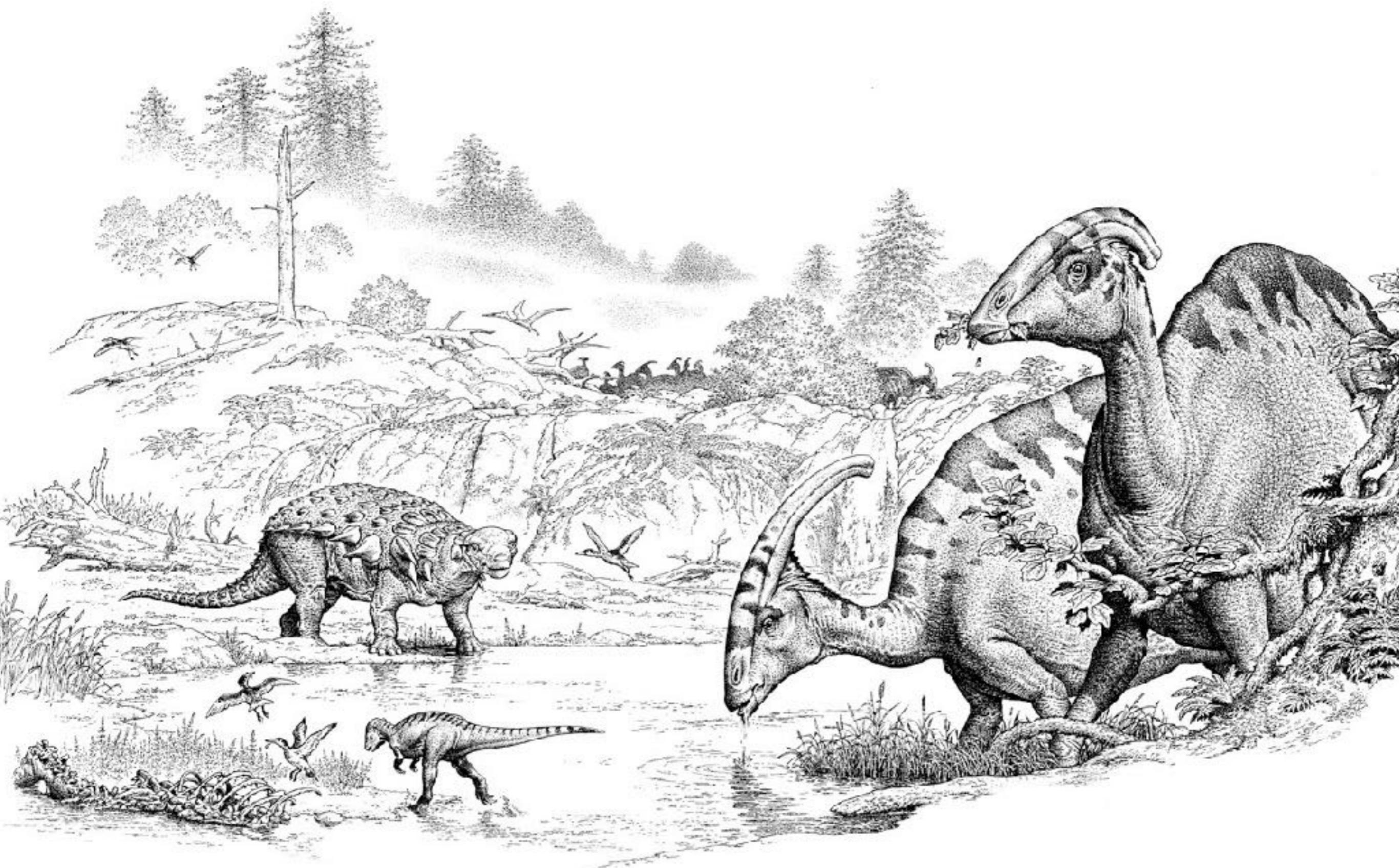
Herrerasaurus

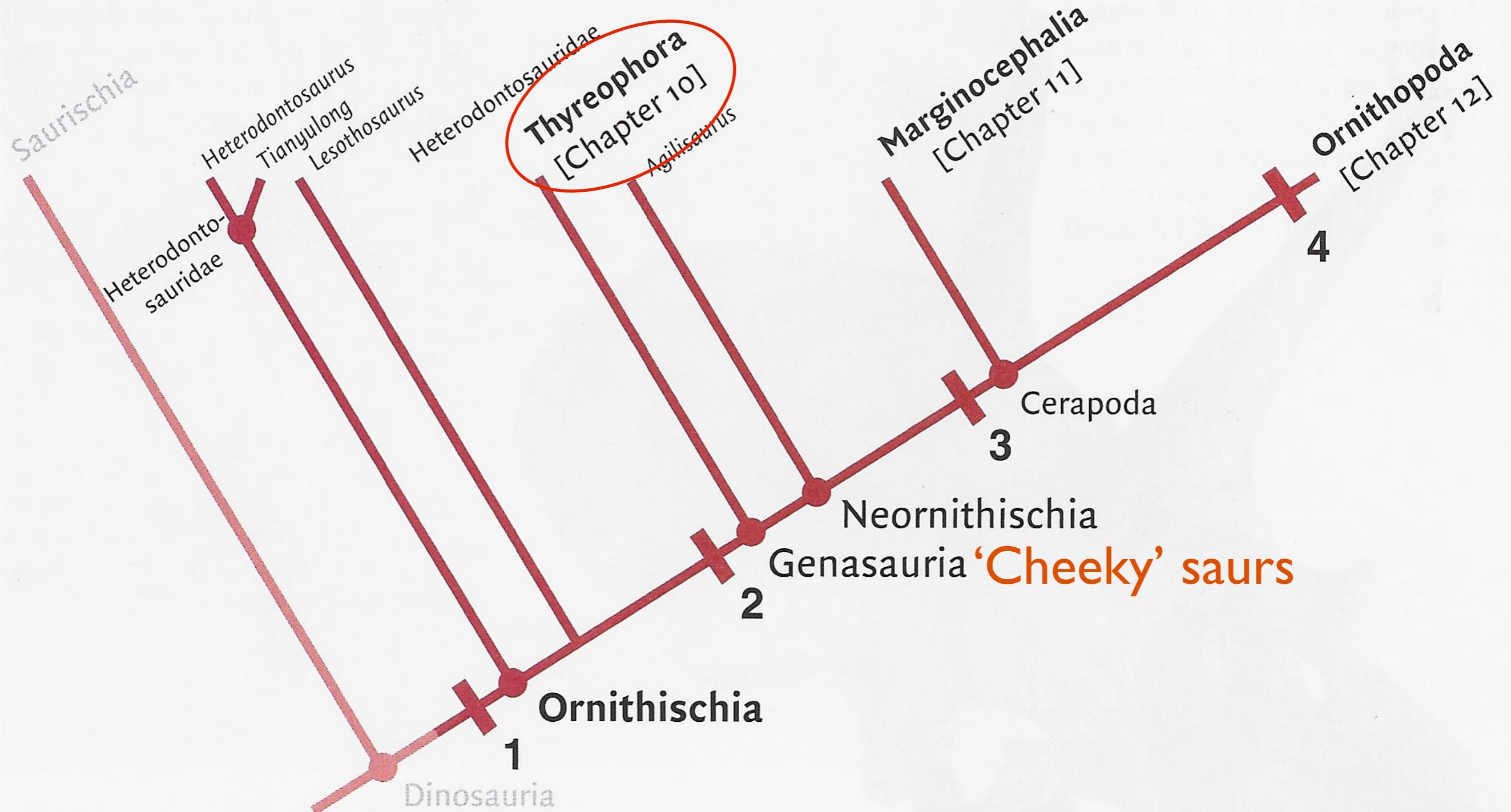


Coelophysis



Ornithischians!





Genosauria

Thyreophora

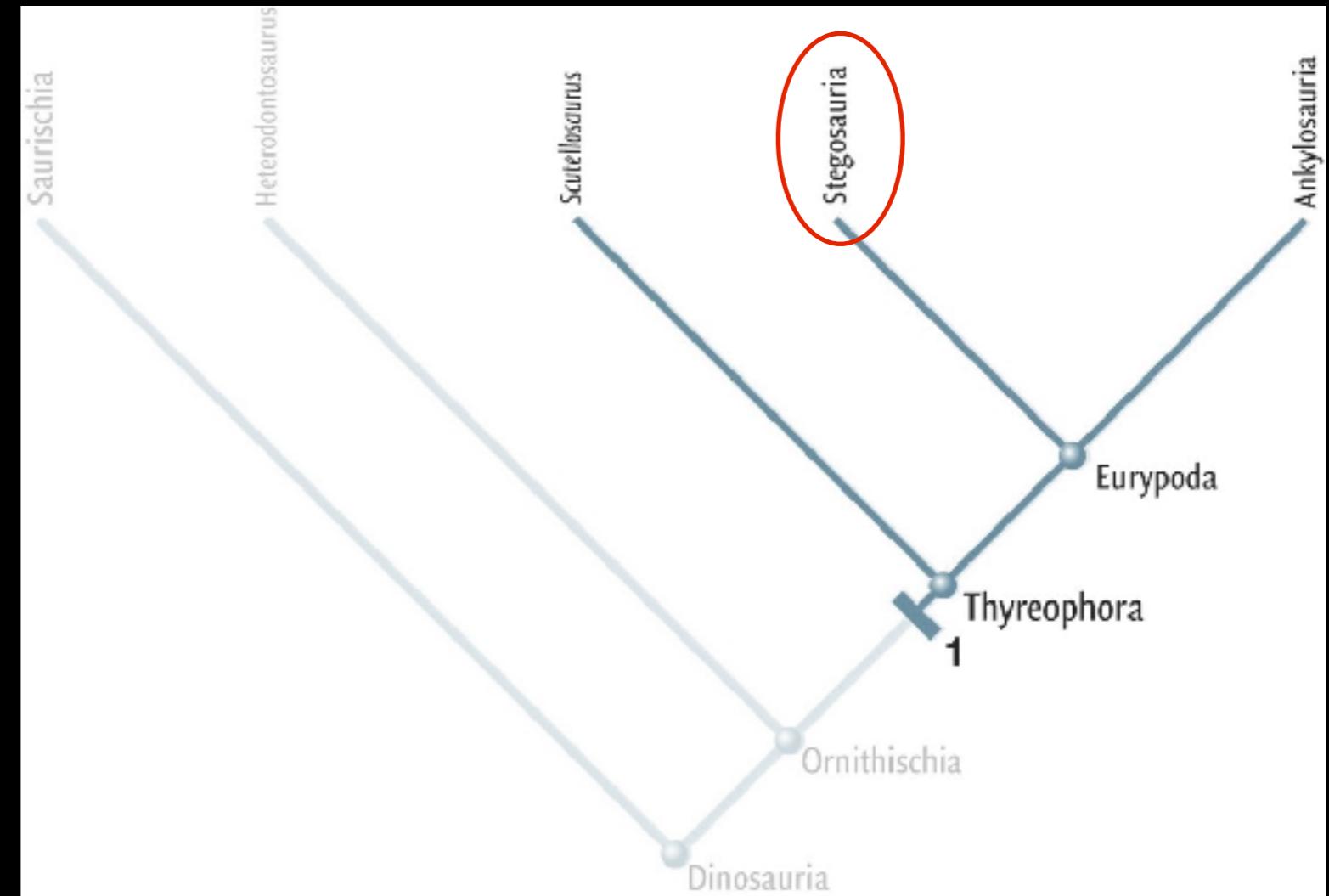
Stegosauria

Basal Thyreophorans

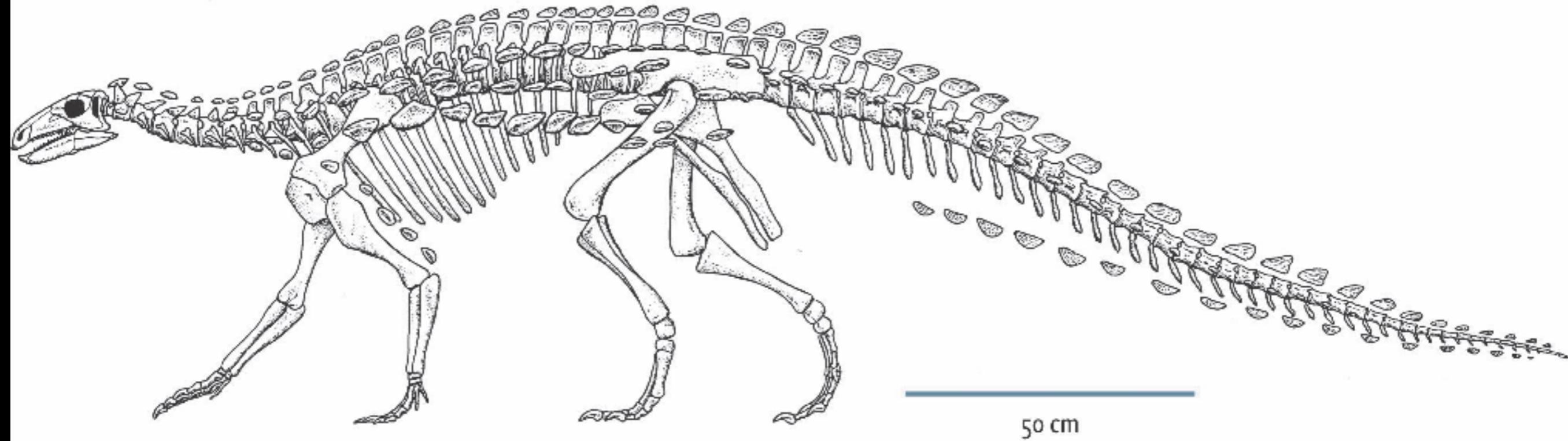
bipedal to quadrupedal
osteoderms



Scutellosaurus
4 ft long
Early Jurassic, North America

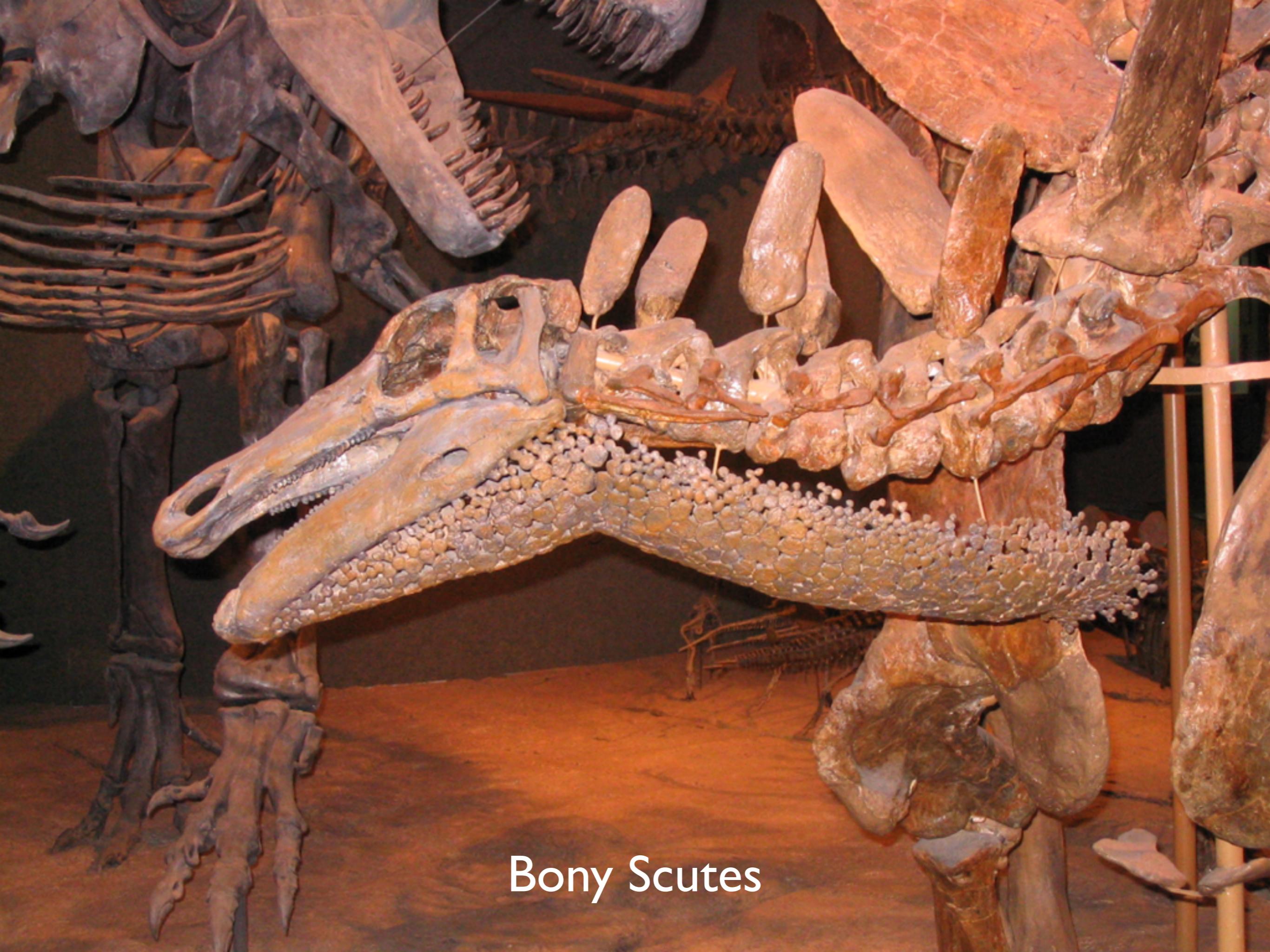


Scelidosaurus
13 ft long
Early Jurassic, England



Bony Scutes (Osteoderms)

Scelidosaurus
13 ft long
Early Jurassic
England



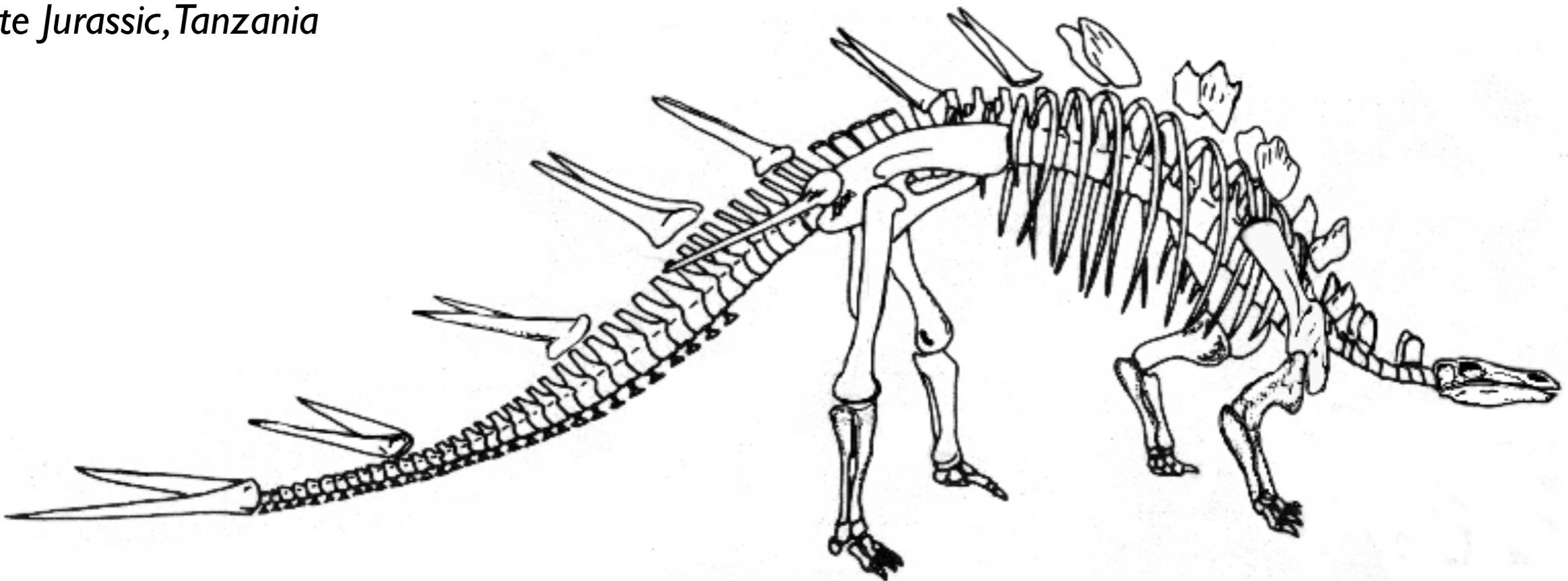
Bony Scutes

Shared, derived traits of Stegosauria

Kentrosaurus

15 ft long

Late Jurassic, Tanzania



- Loss of ossified tendons
- Rows of osteoderms over body
- Plates/Spines
- Hooved Feet
- Tall thoracic vertebrae

Basal Stegosauria

Parascapular spines

Thagomizer

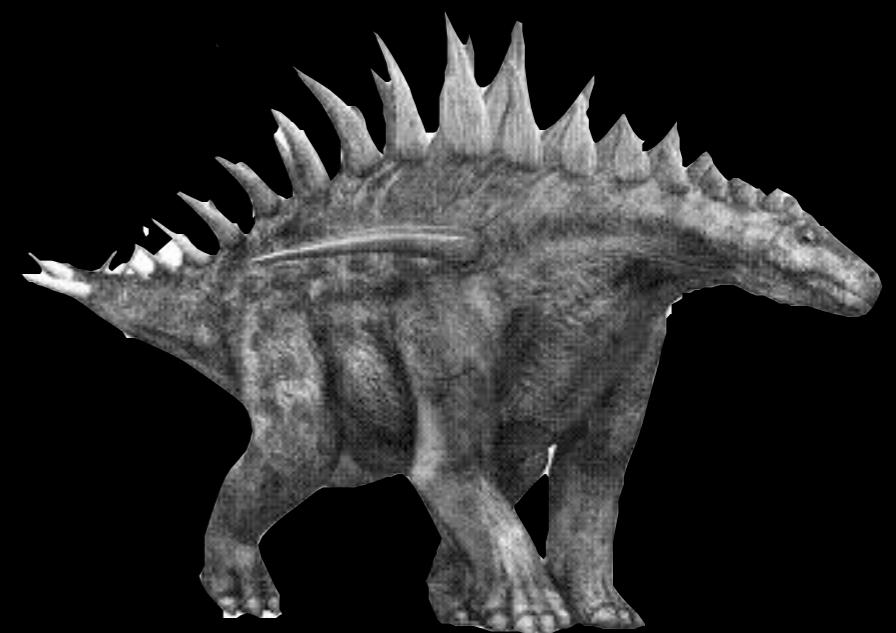
Plates

Osteoderms



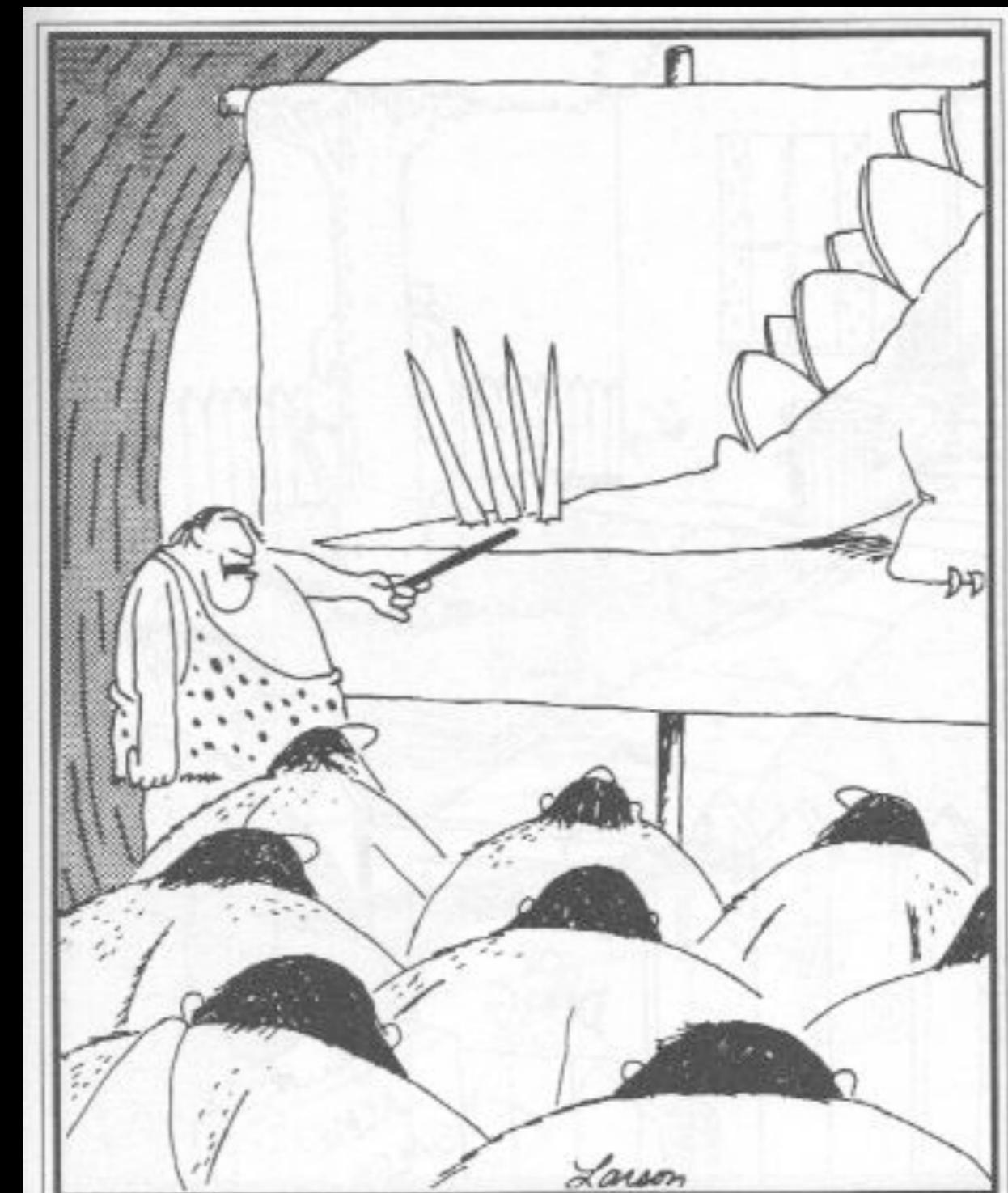
Huayangosaurus

15 ft long



Dermal Armour?

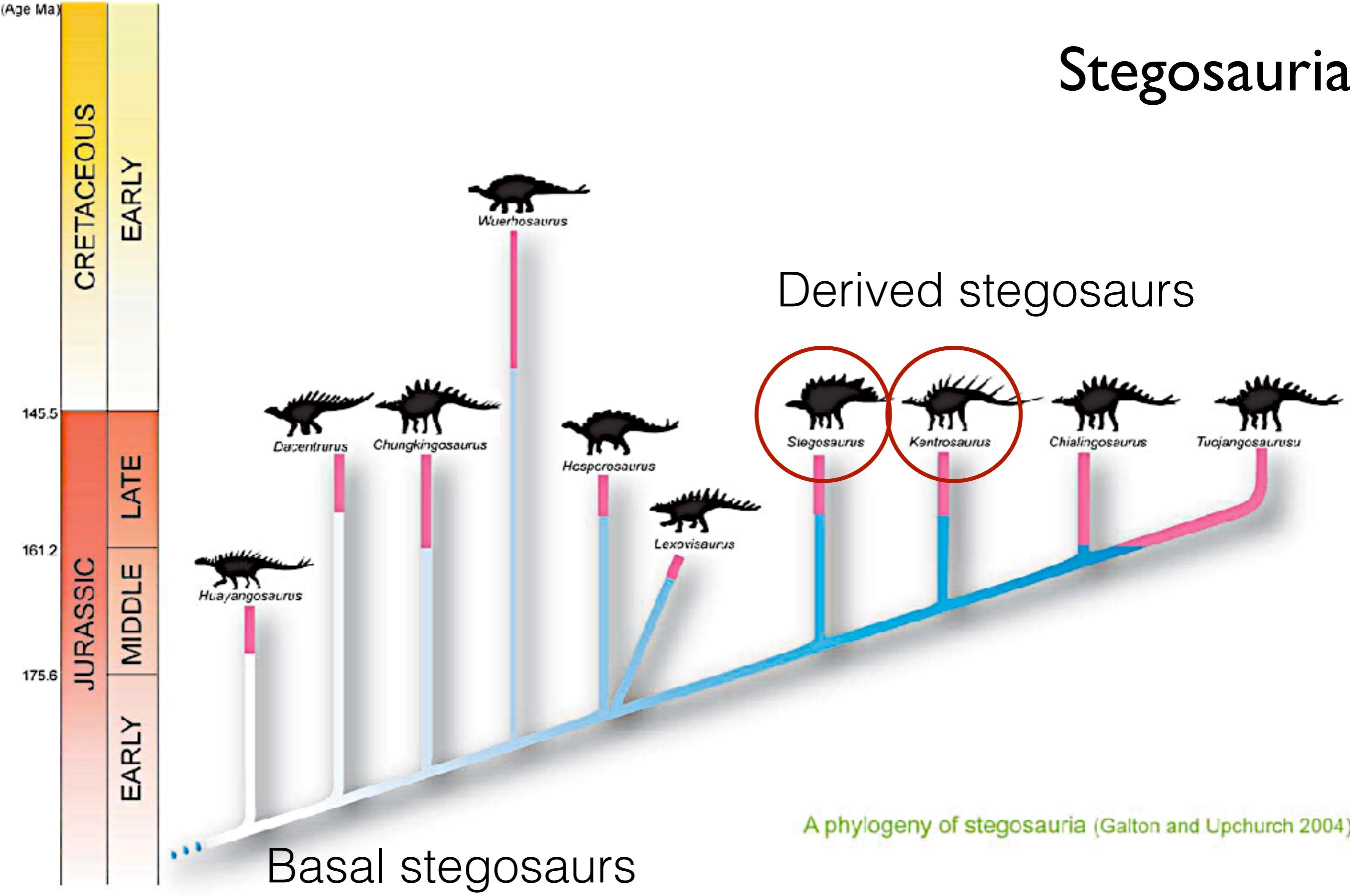
The Thagomizer

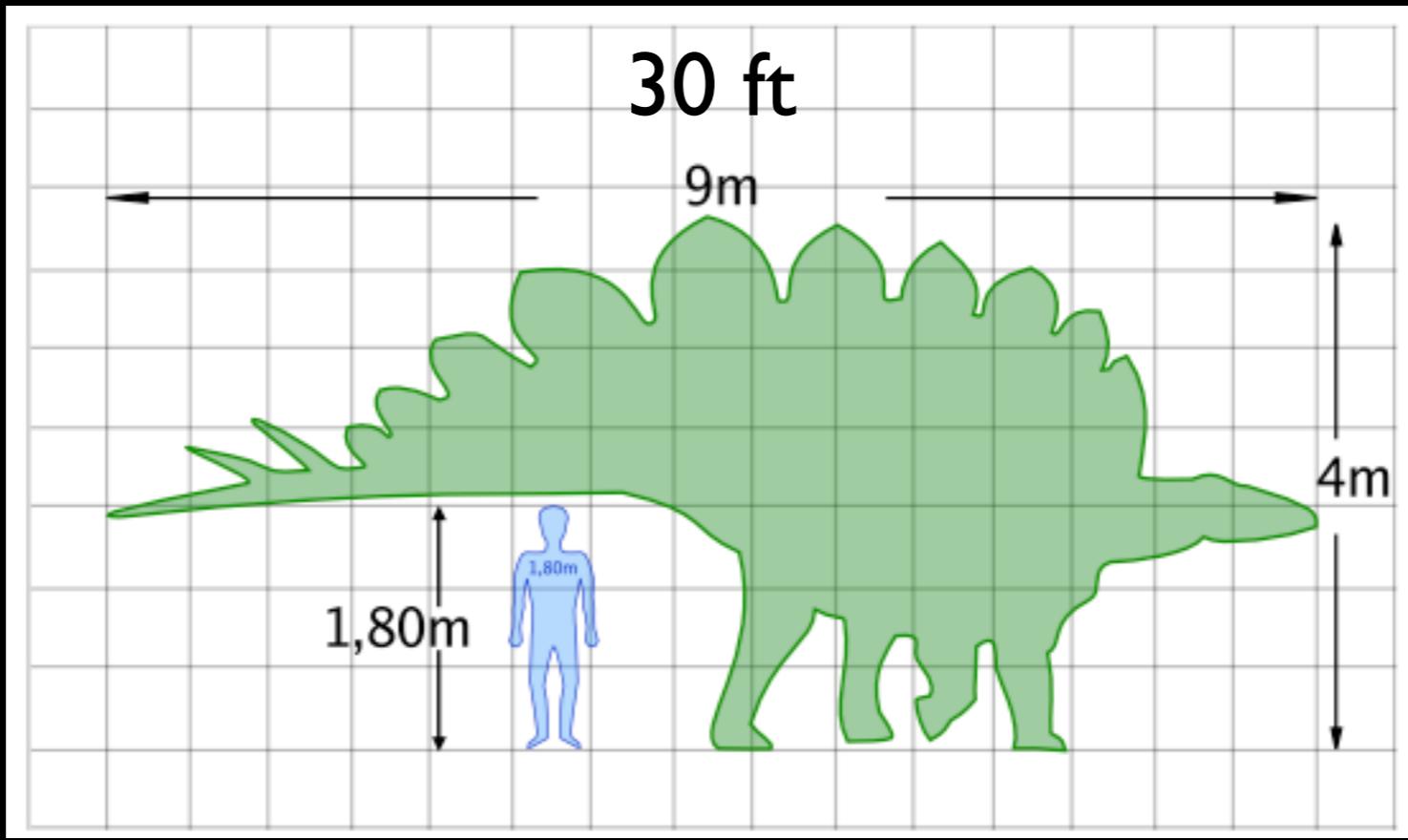
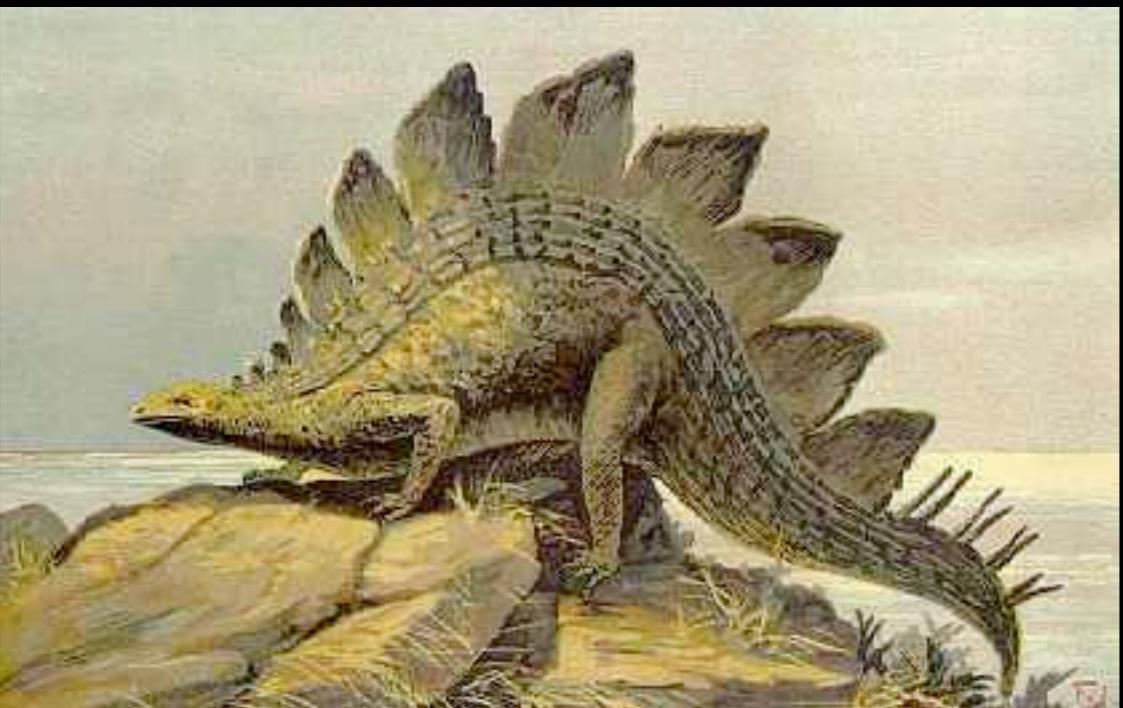


"Now this end is called the thagomizer . . . after the
late Thag Simmons."

(Age Ma)

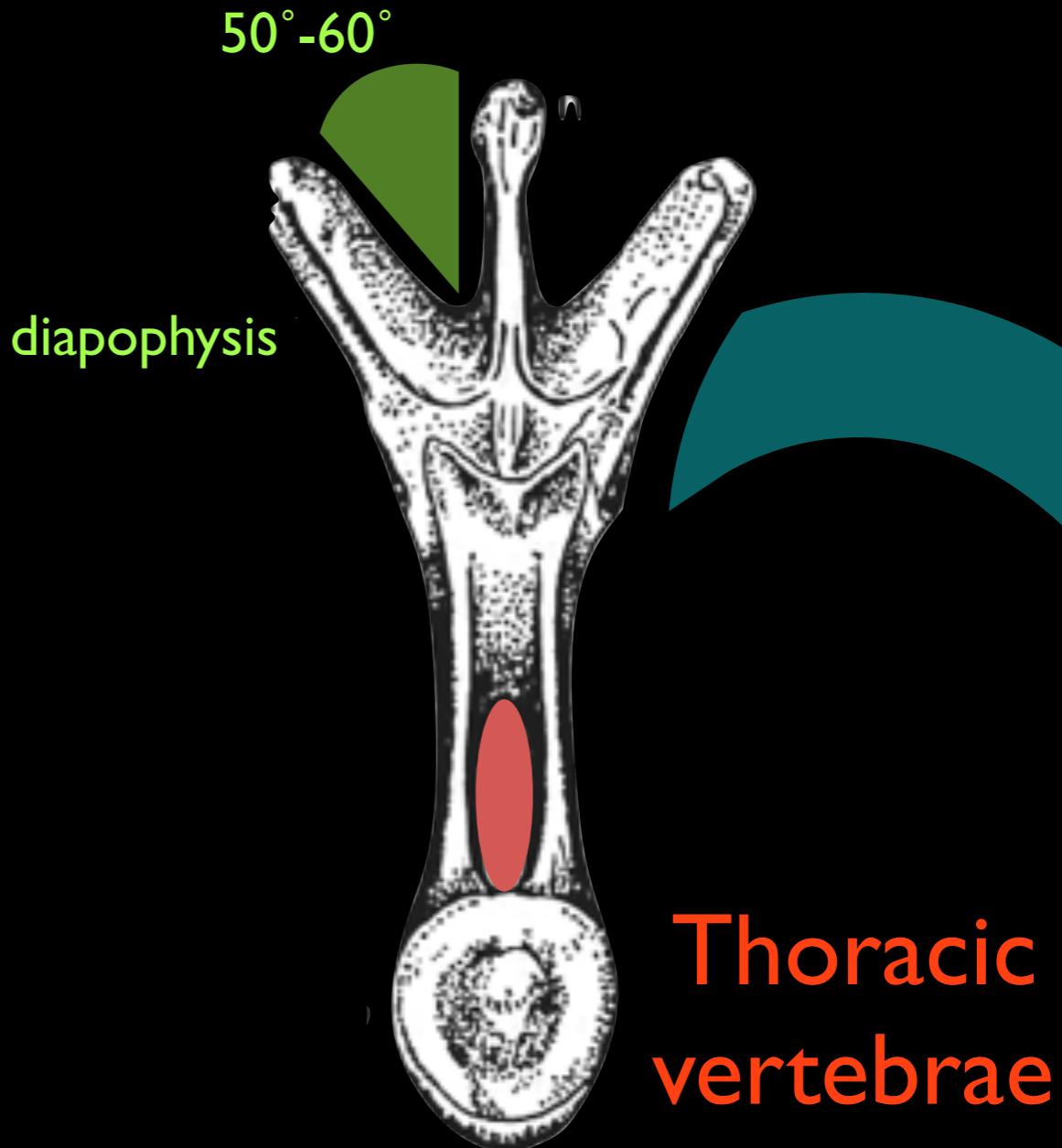
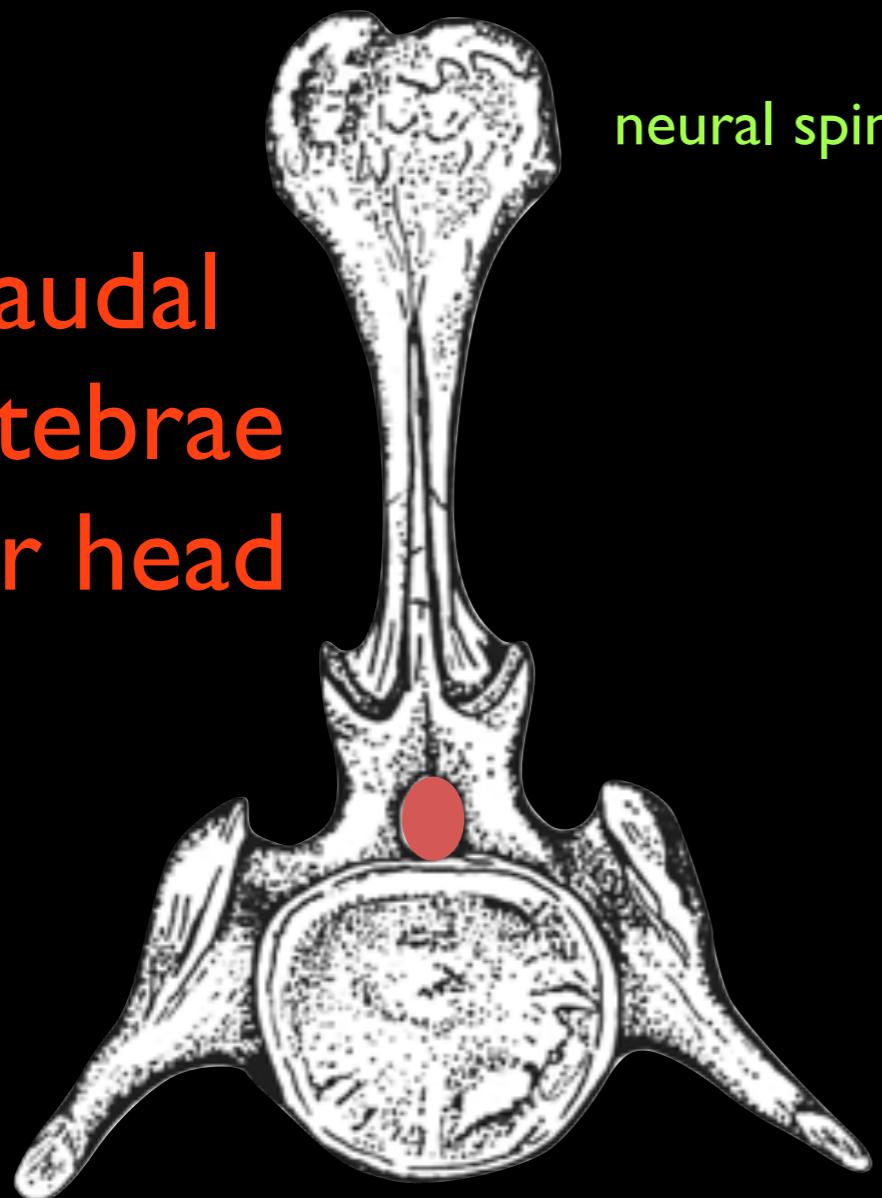
Stegosauria





Lost World Clip
22:15-

Caudal
vertebrae
near head



Expansion of gut cavity provided by dorsally elongated vertebral centrum

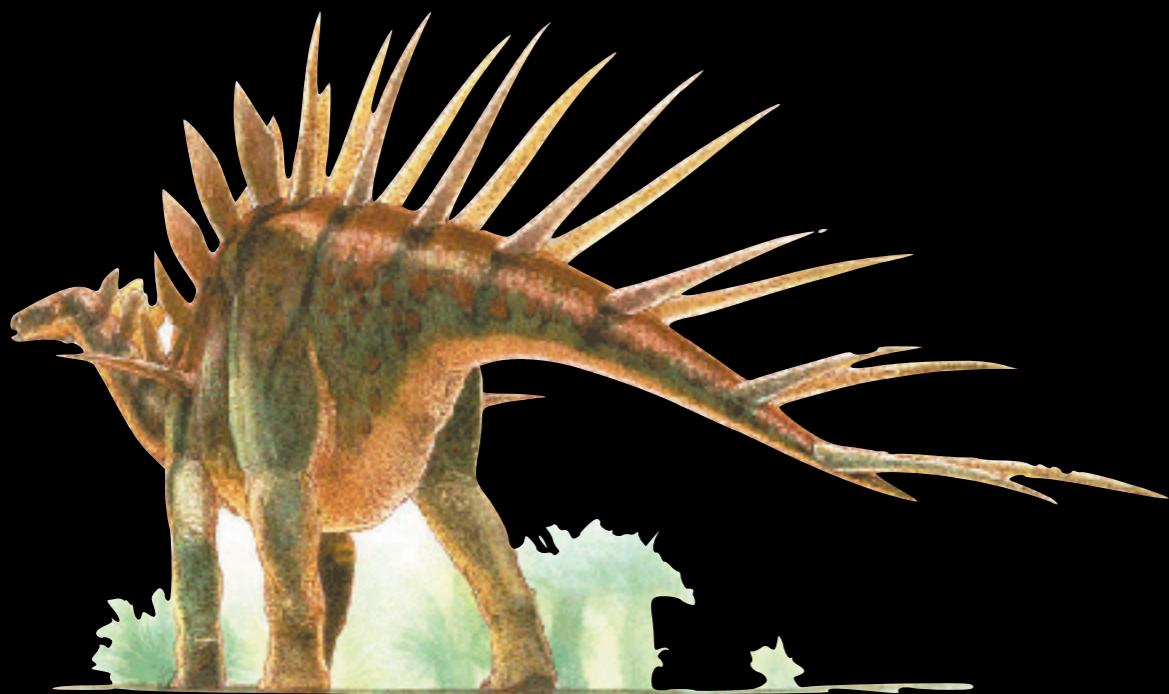
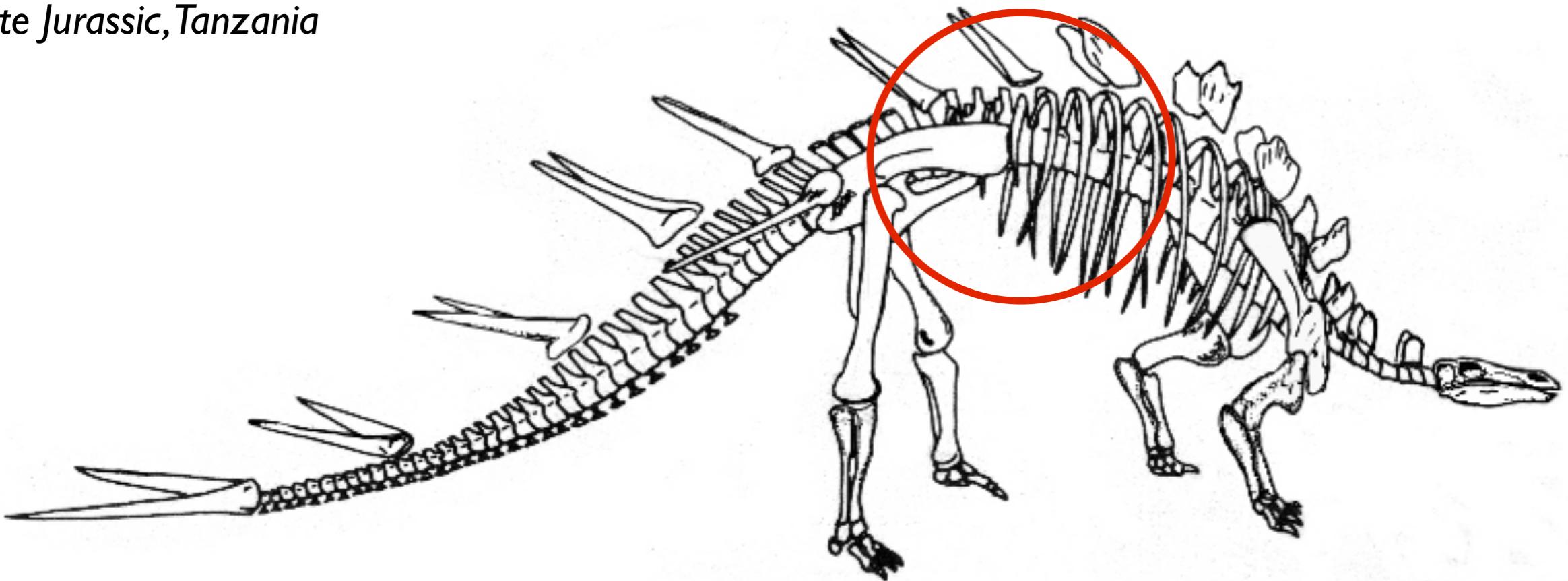
This also provided support for osteodorms and for the hip, as the femur was elevated above the shoulders and supported most of the weight

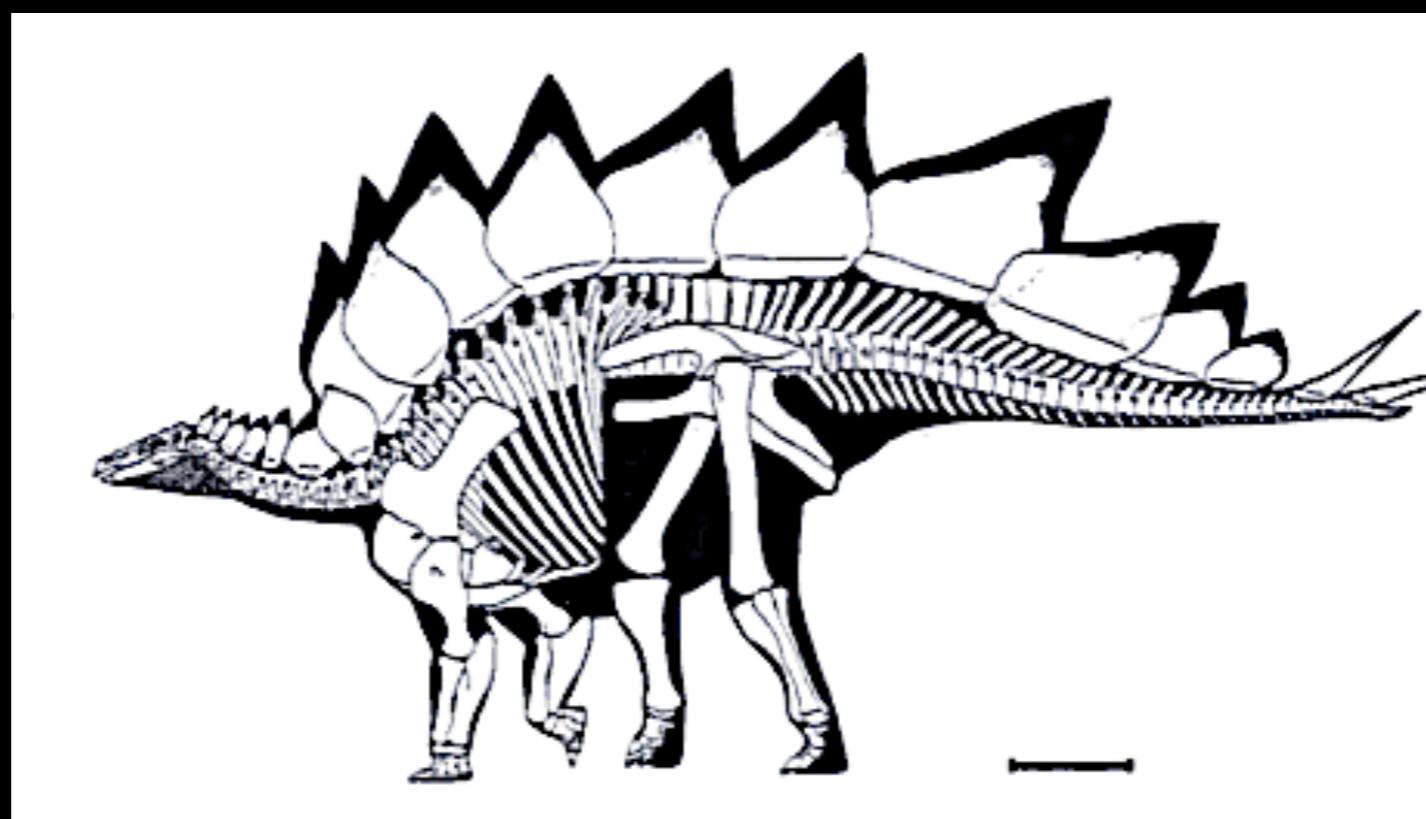
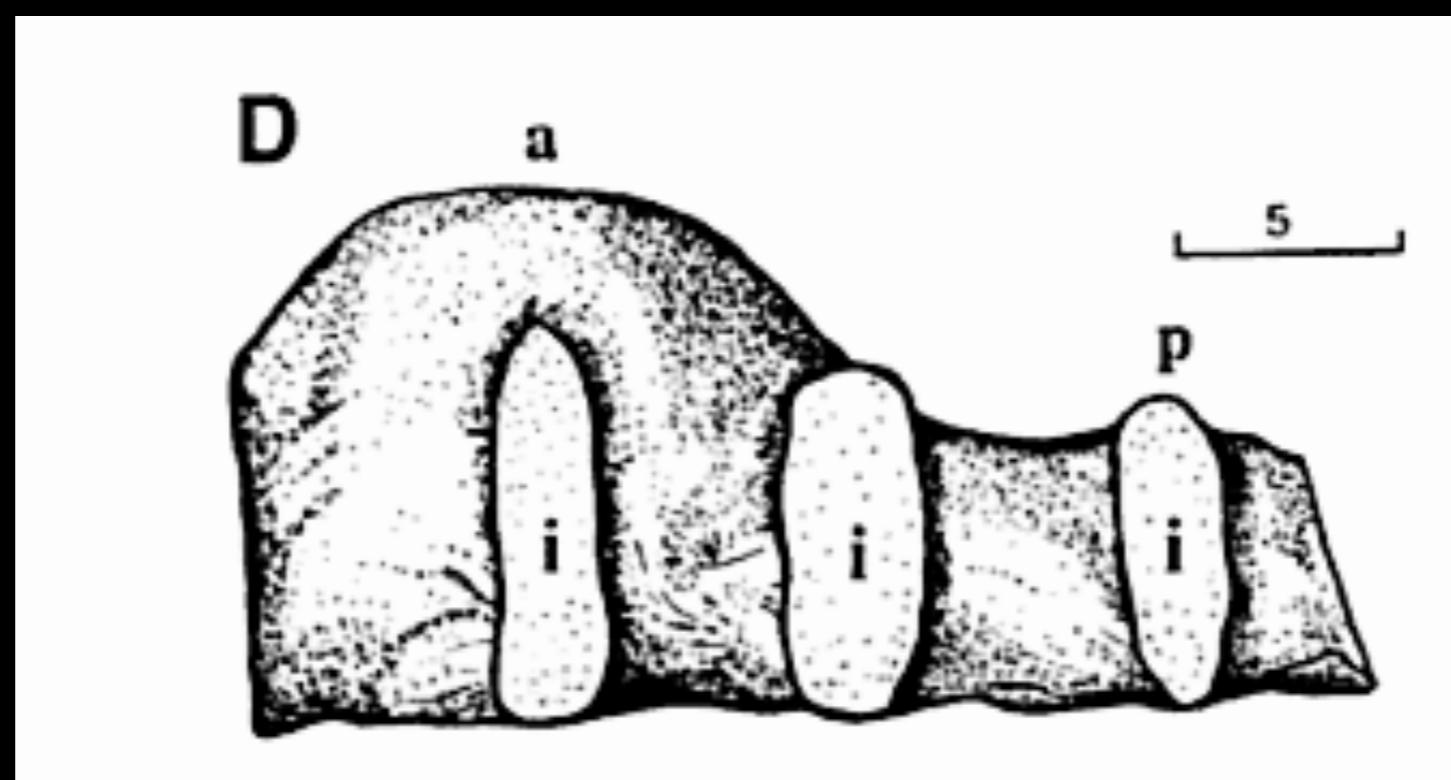
Shared, derived traits of Stegosauria

Kentrosaurus

15 ft long

Late Jurassic, Tanzania





Diet



Stegosaurus



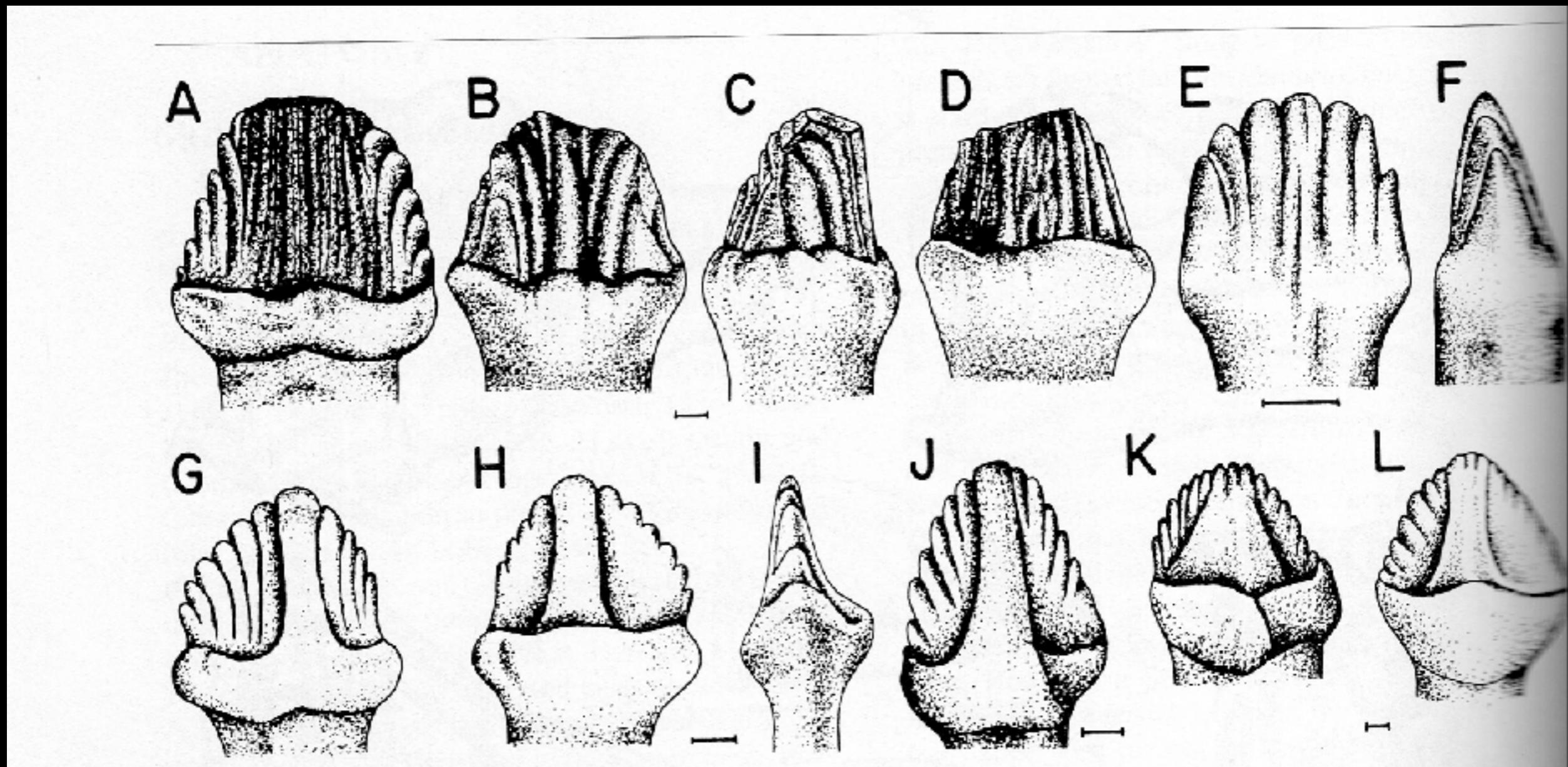
Inset tooth row: implies cheeks ~ it's a Genosaur!

Low coronoid process

Teeth are small, simple, triangular

Spaces btw teeth... not an efficient grinder

Teeth lack regular worn surfaces



Teeth of stegosauran dinosaurs

-basal ornithischian (as opposed to derived ornithischian)

-a small cry from carnivorous ancestors



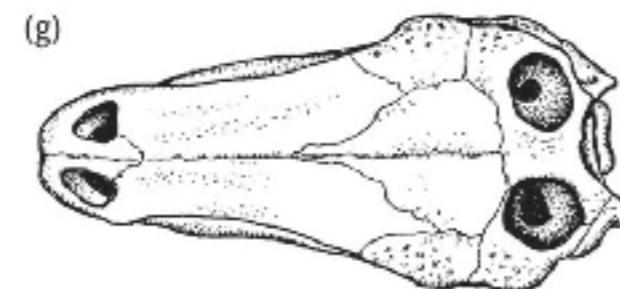
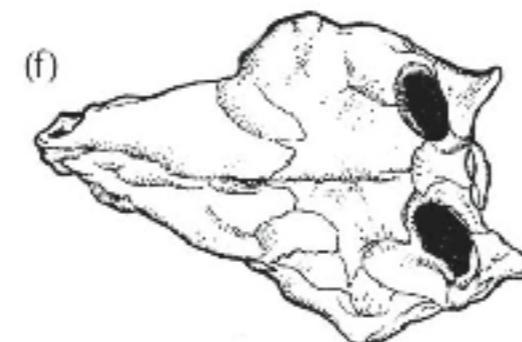
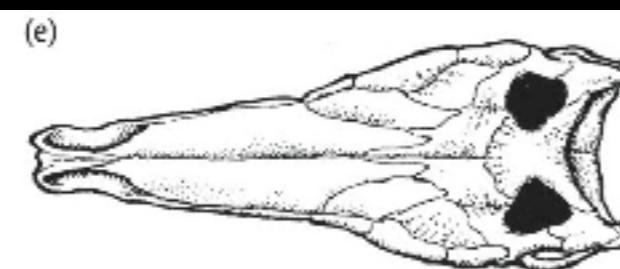
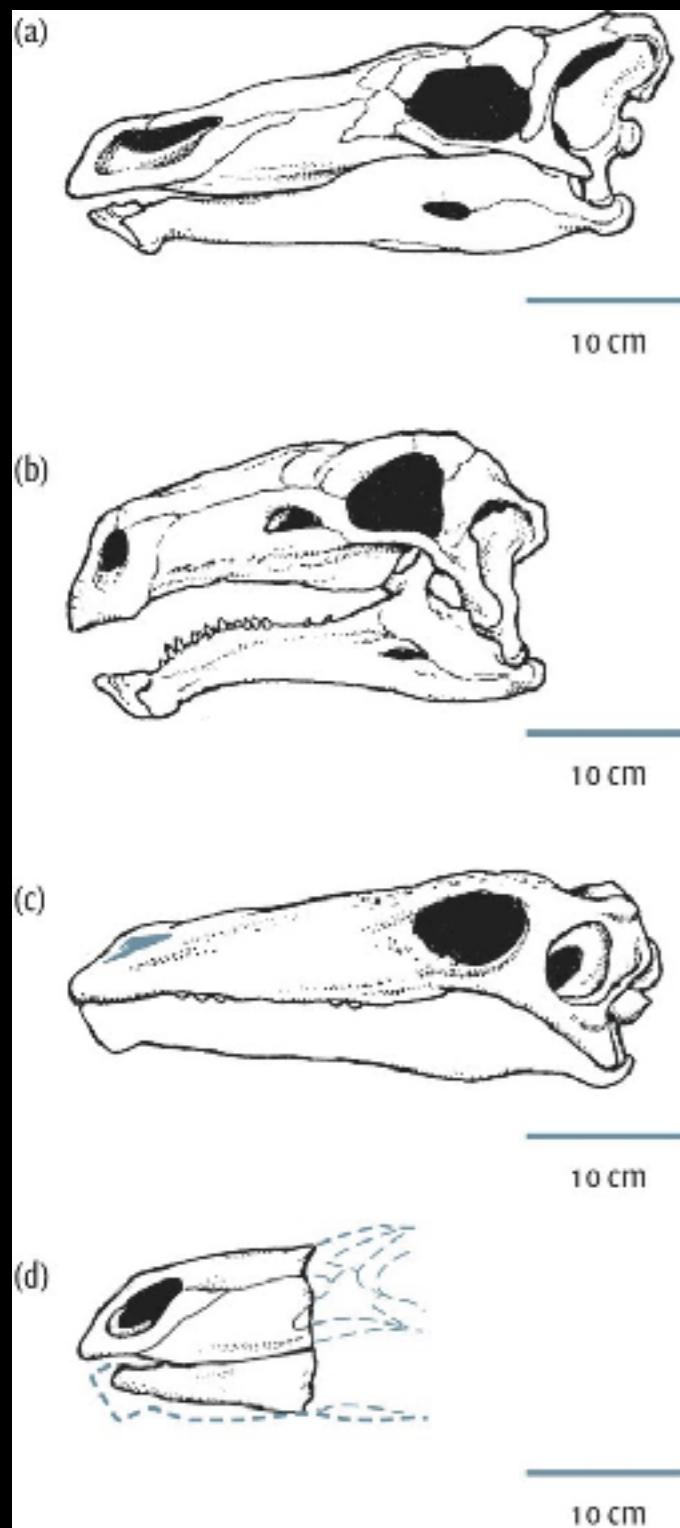
Small modifications

Diet



*The story gets stranger yet...
If they didn't chew, maybe they processed it all in their gut.
Typically, you find gastrolithes with dinosaurs that process their
food this way.... but no gastrolithes
So what did they eat?*

Diet



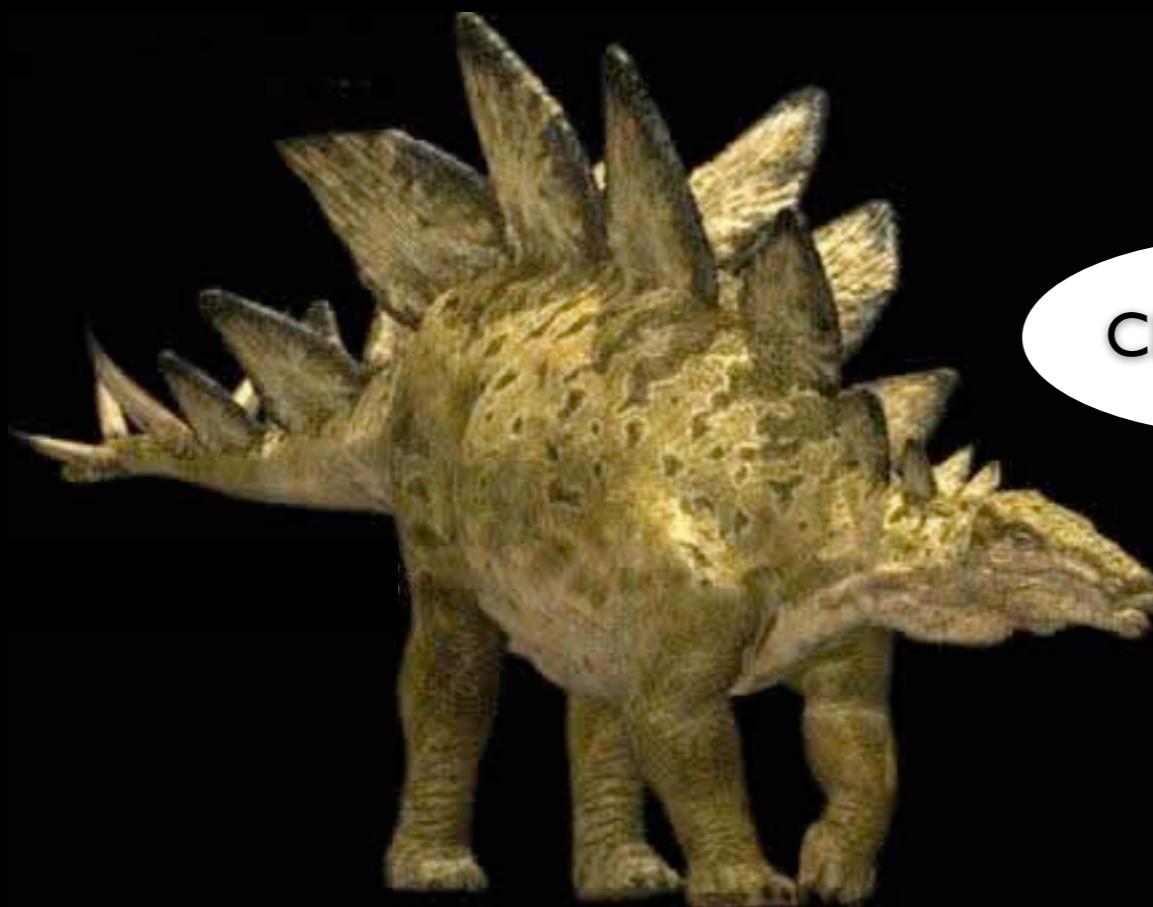
Narrow jaws => selective feeding
Wide jaws => generalist feeding



'Black' Rhino

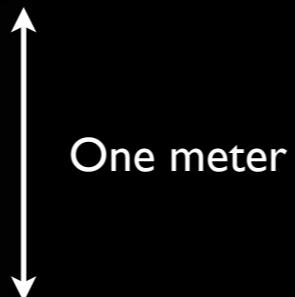
'White' Rhino

Diet



Stegosaurus

Clever girl...



Kanyesaurus westicus



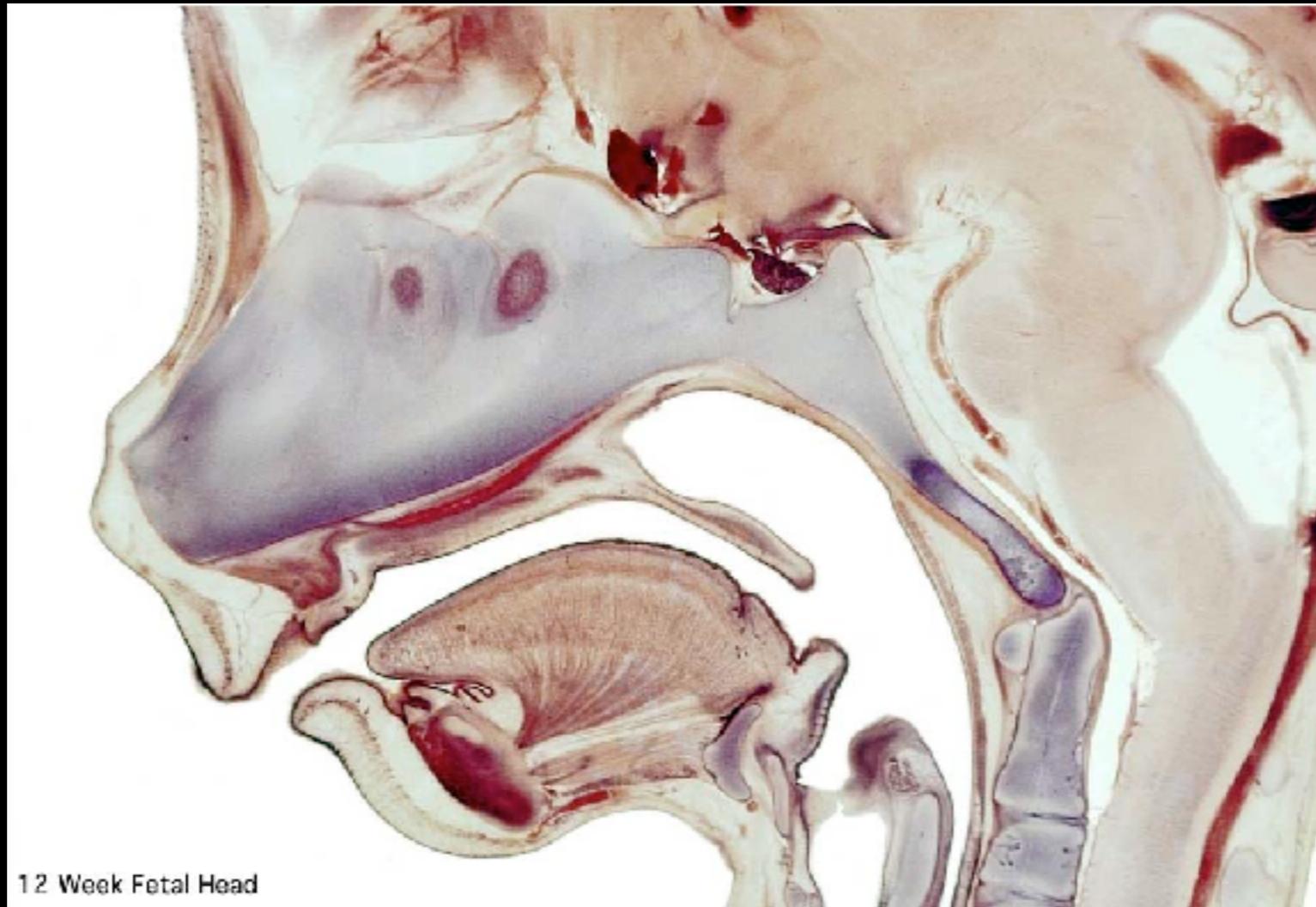
Likely low-browsers

Ferns, cycads, herbaceous gymnosperms

This is just based on 'height'

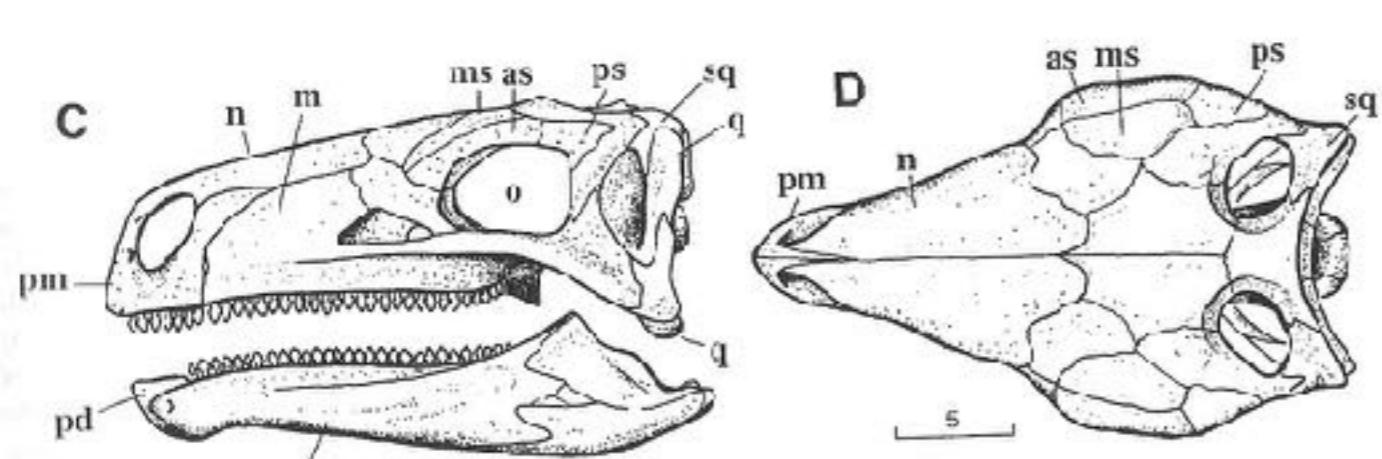


Medial Plane

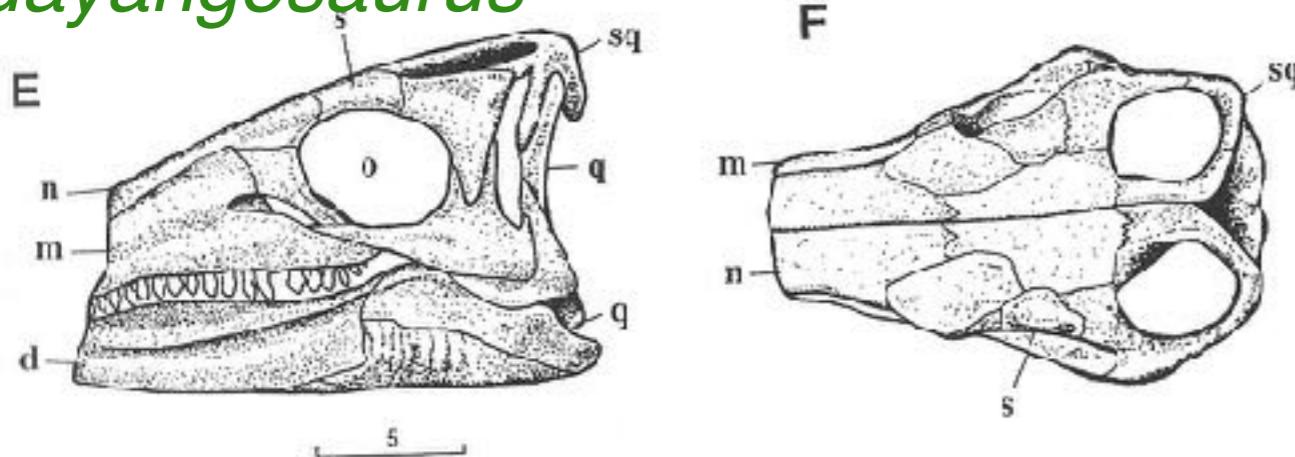


12 Week Fetal Head

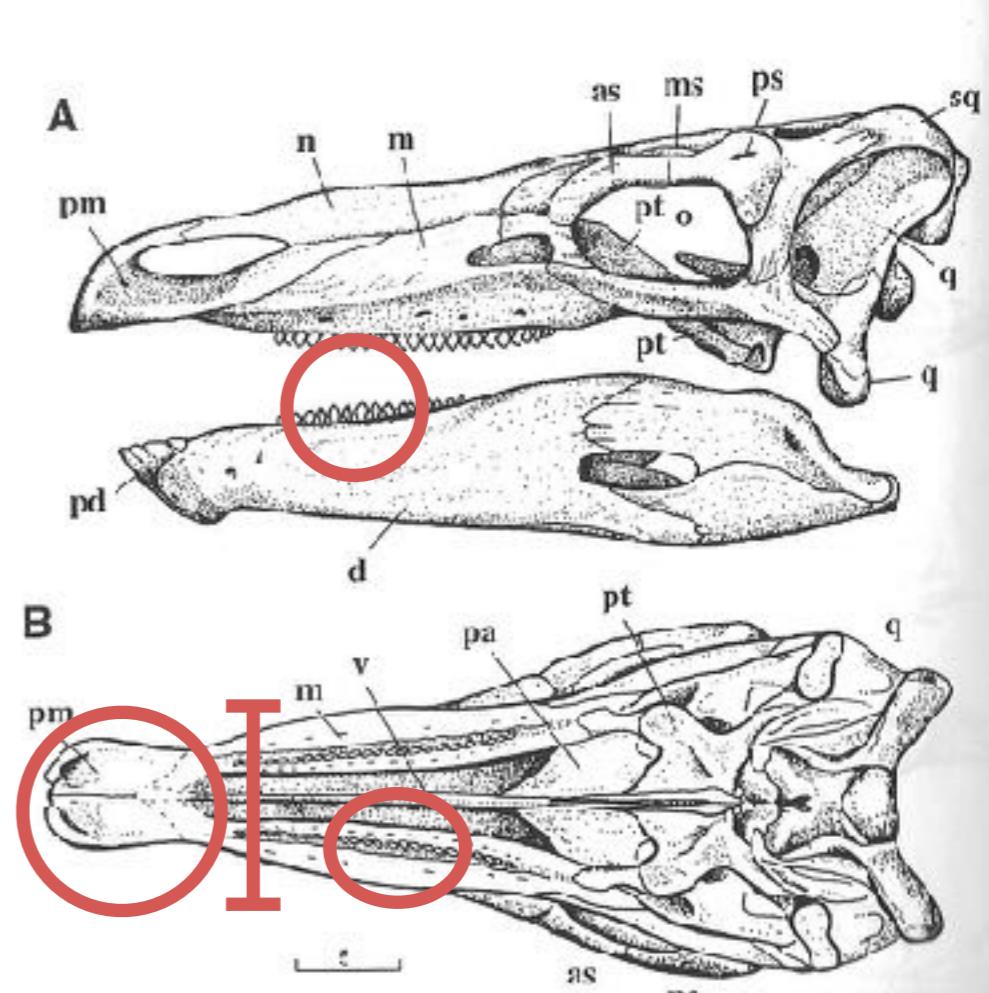
*Median keel along the length of the palate
probably supported a soft secondary palate; may
have separated the dorsal nasal passages from the
mouth- **breathe while you chew!***



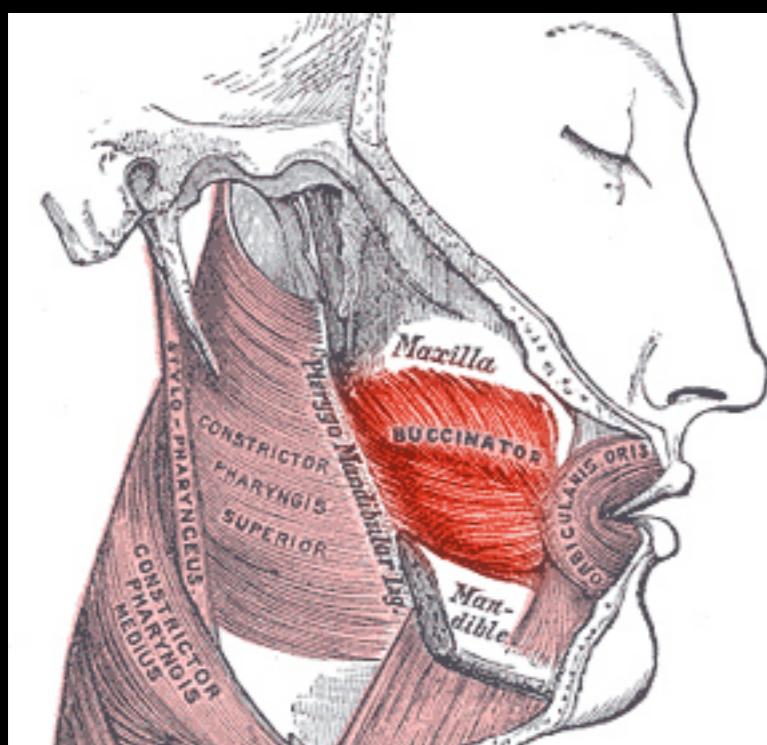
Huayangosaurus



Scelidosaurus

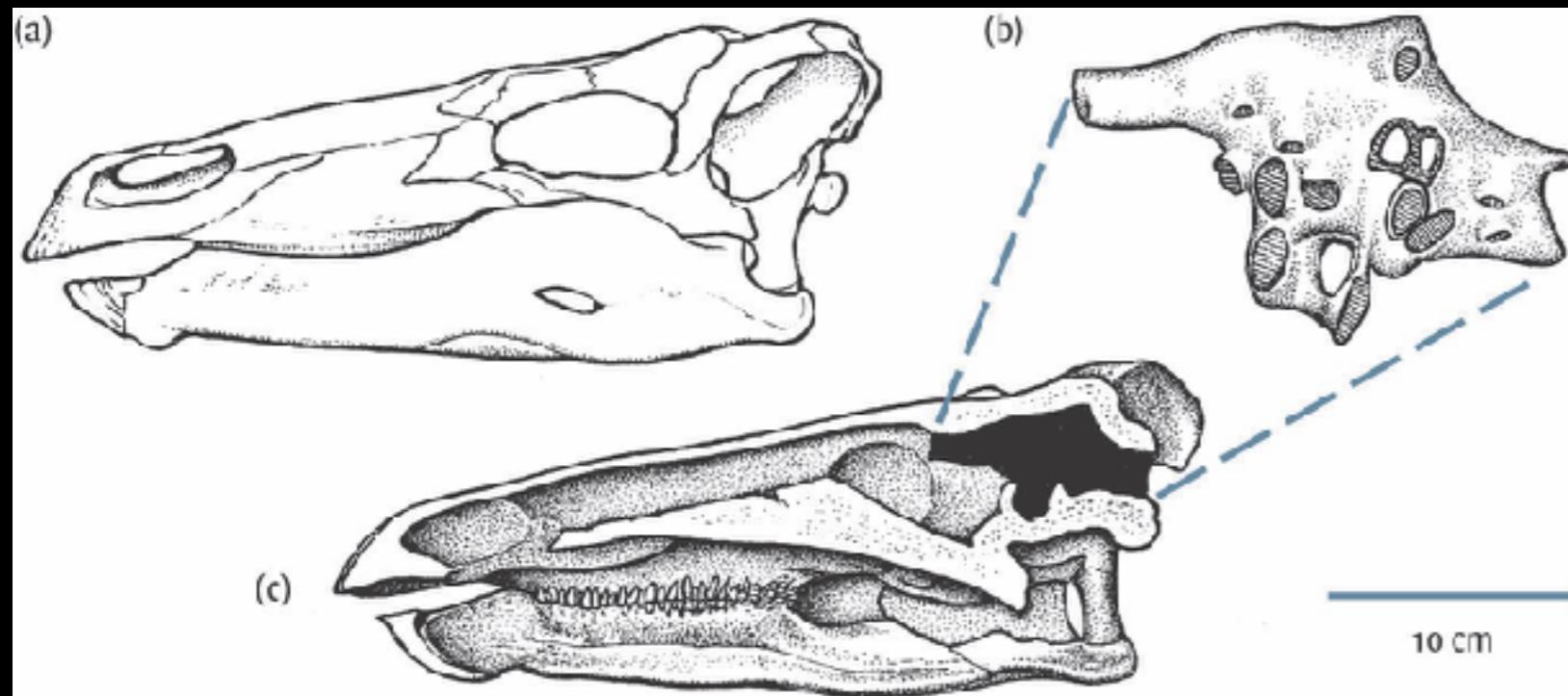


Stegosaurus



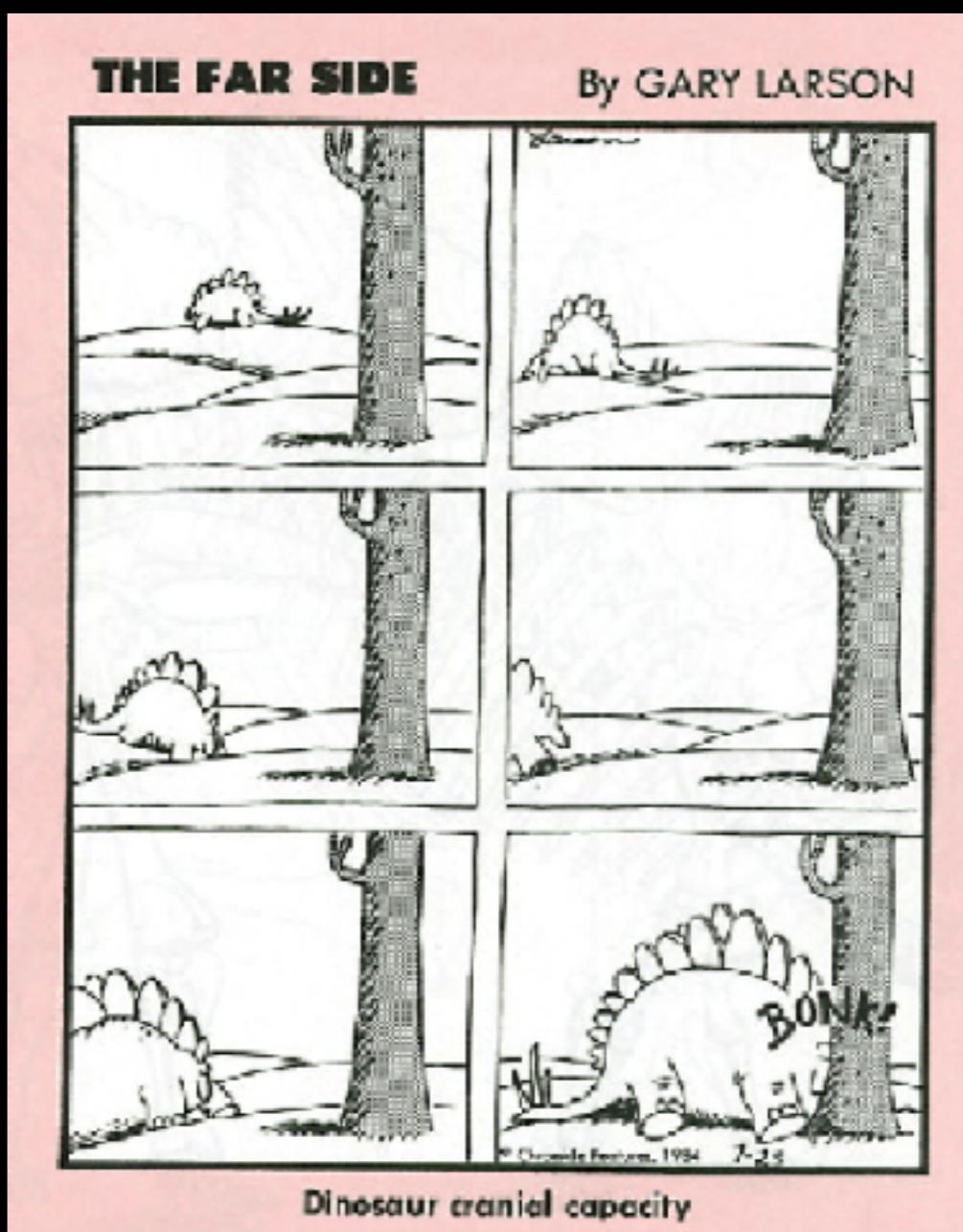
Cheeks:
No reptile has ever had a 'buccinator' muscle
Answer: highly flexible tongue

Brains

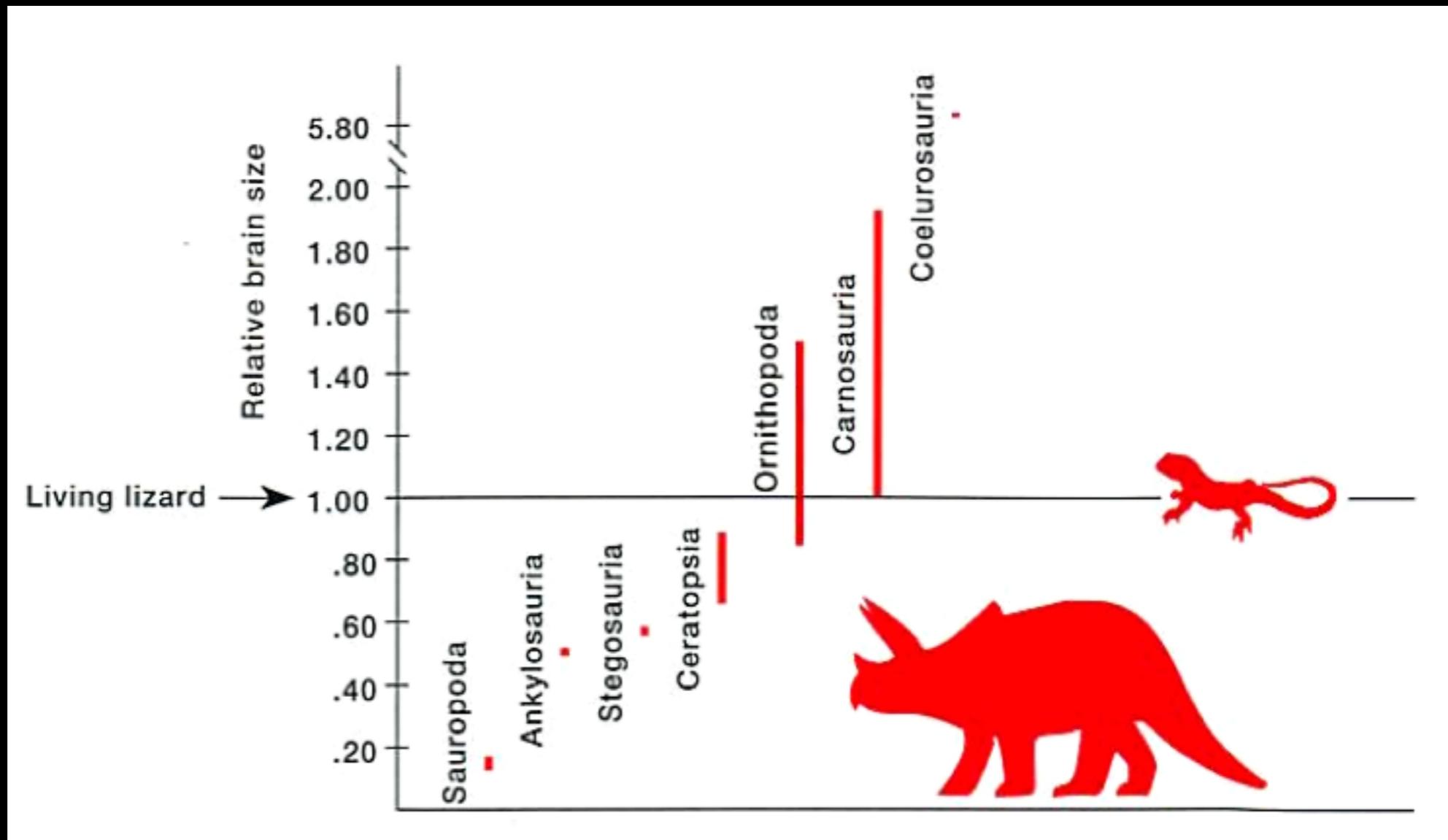


0.001% of stegosaur body weight

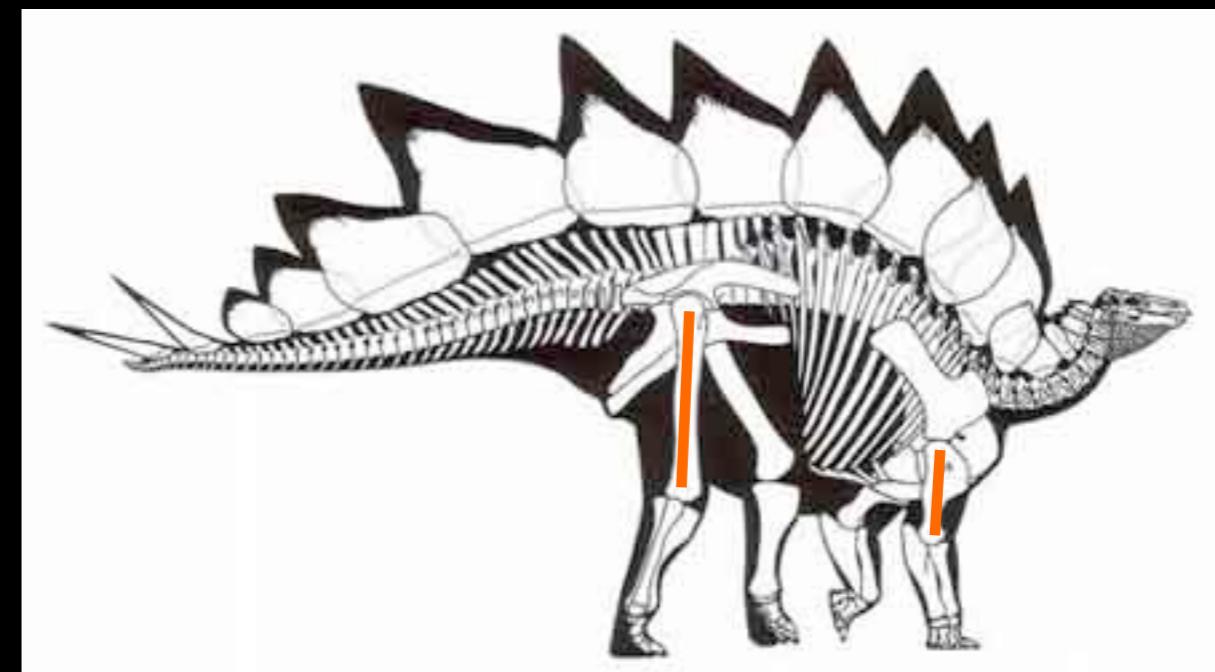
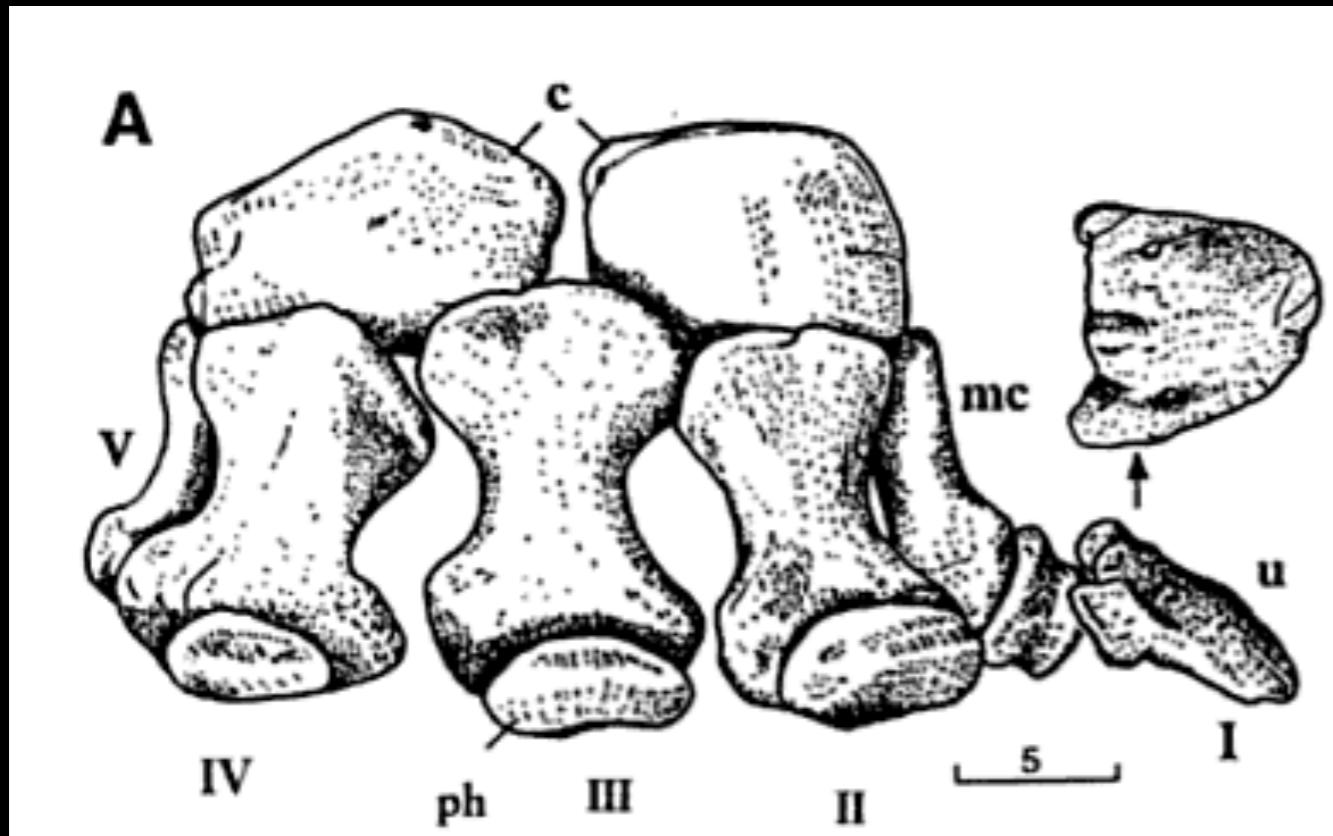
Compared to 1.8% in humans (1000x larger per unit body weight!)



Encephalization index

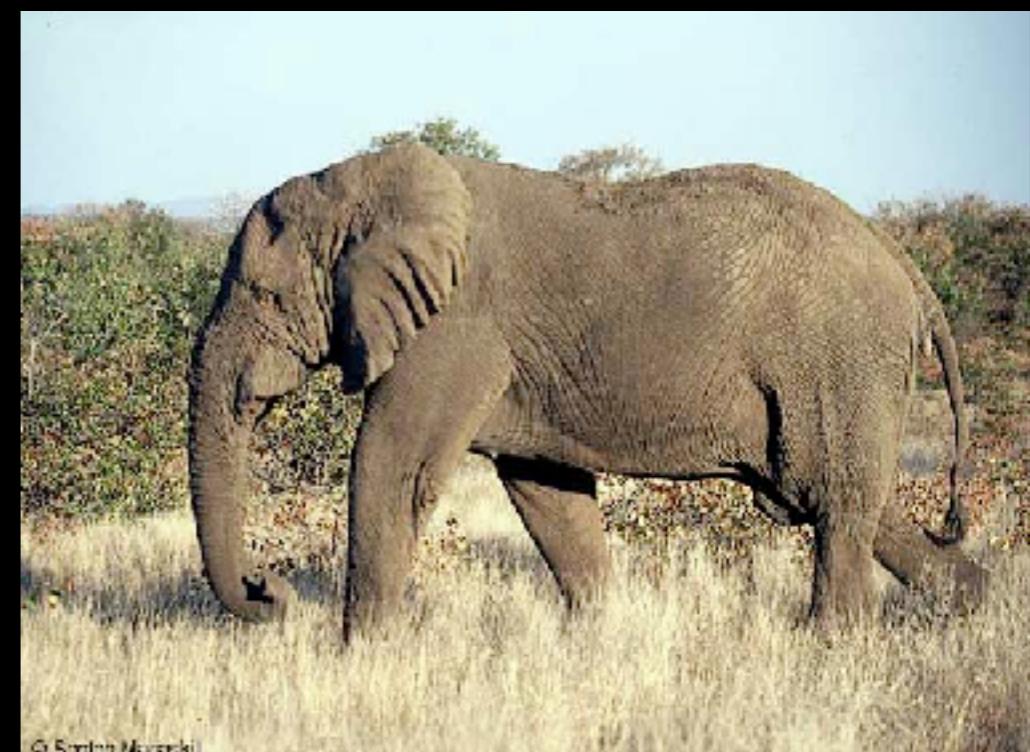


Locomotion



*Elephantine hind feet
Shin bones fused with astragalus/
calcaneum (ankle bones)
Femur: Long compared to humerus
Columnar*

*Facultative Tripodality?
Stocky forelimbs- could be used
for turning/posturing (Bakker)*





Dermal Armour?

Pattern of plates and spines is species-specific

Plates paired or staggered (*Stegosaurus*)

Plates were probably not for defense... not tough enough

Rotation? Surface markings => symmetrical.

Rotation unlikely

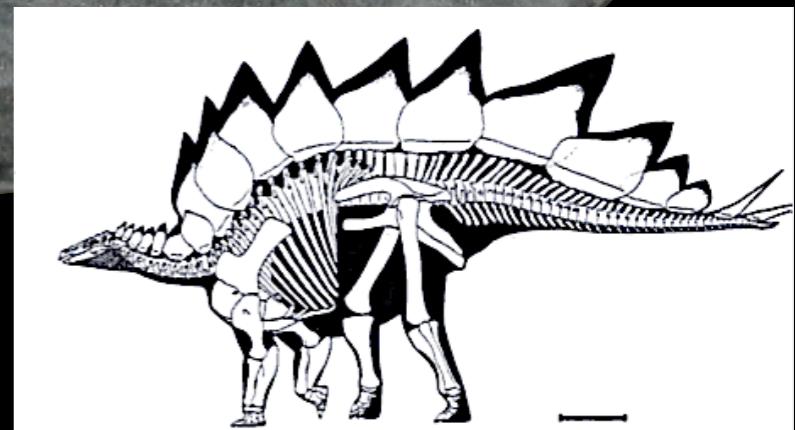
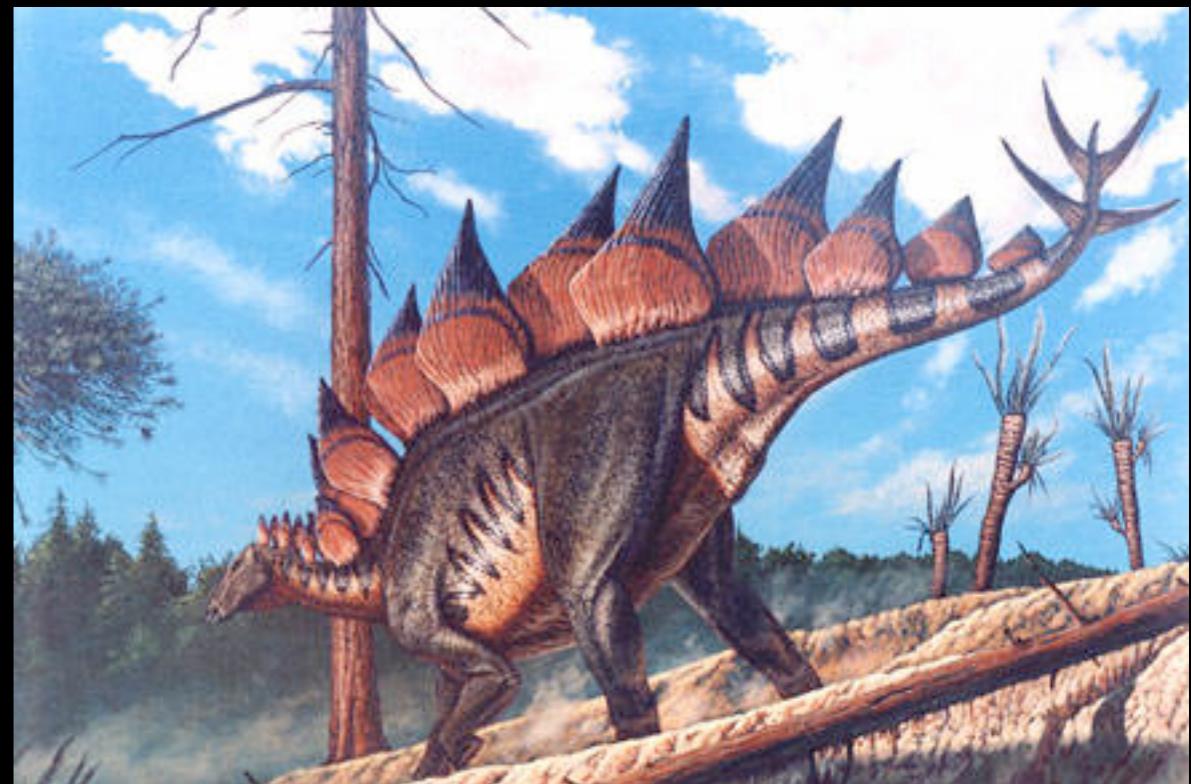
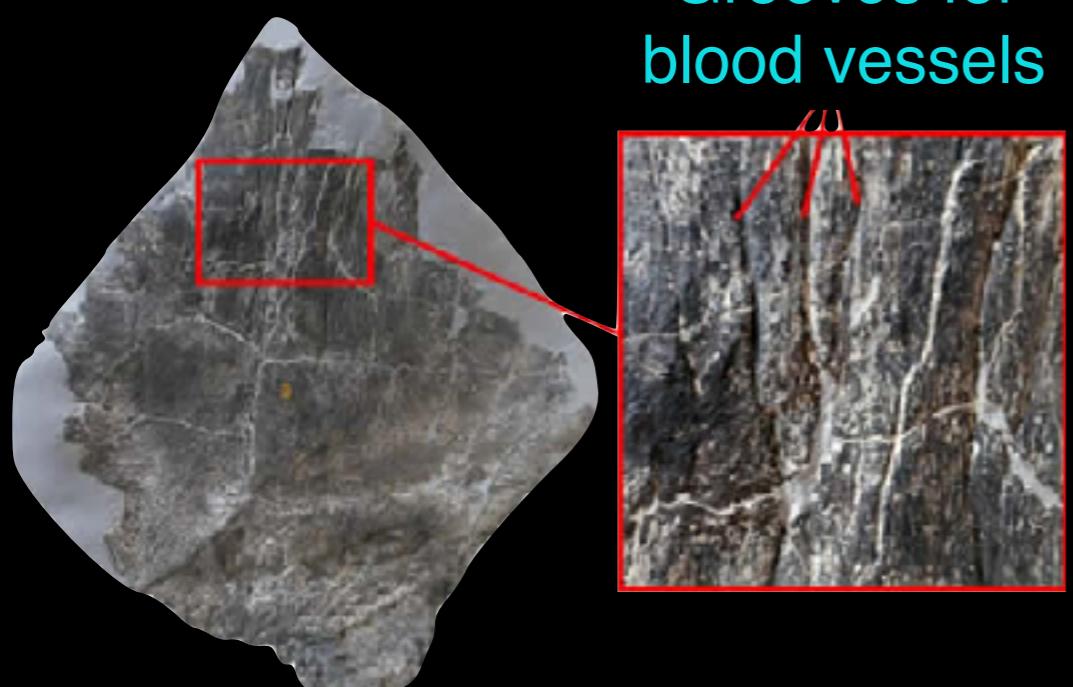
Potential uses:

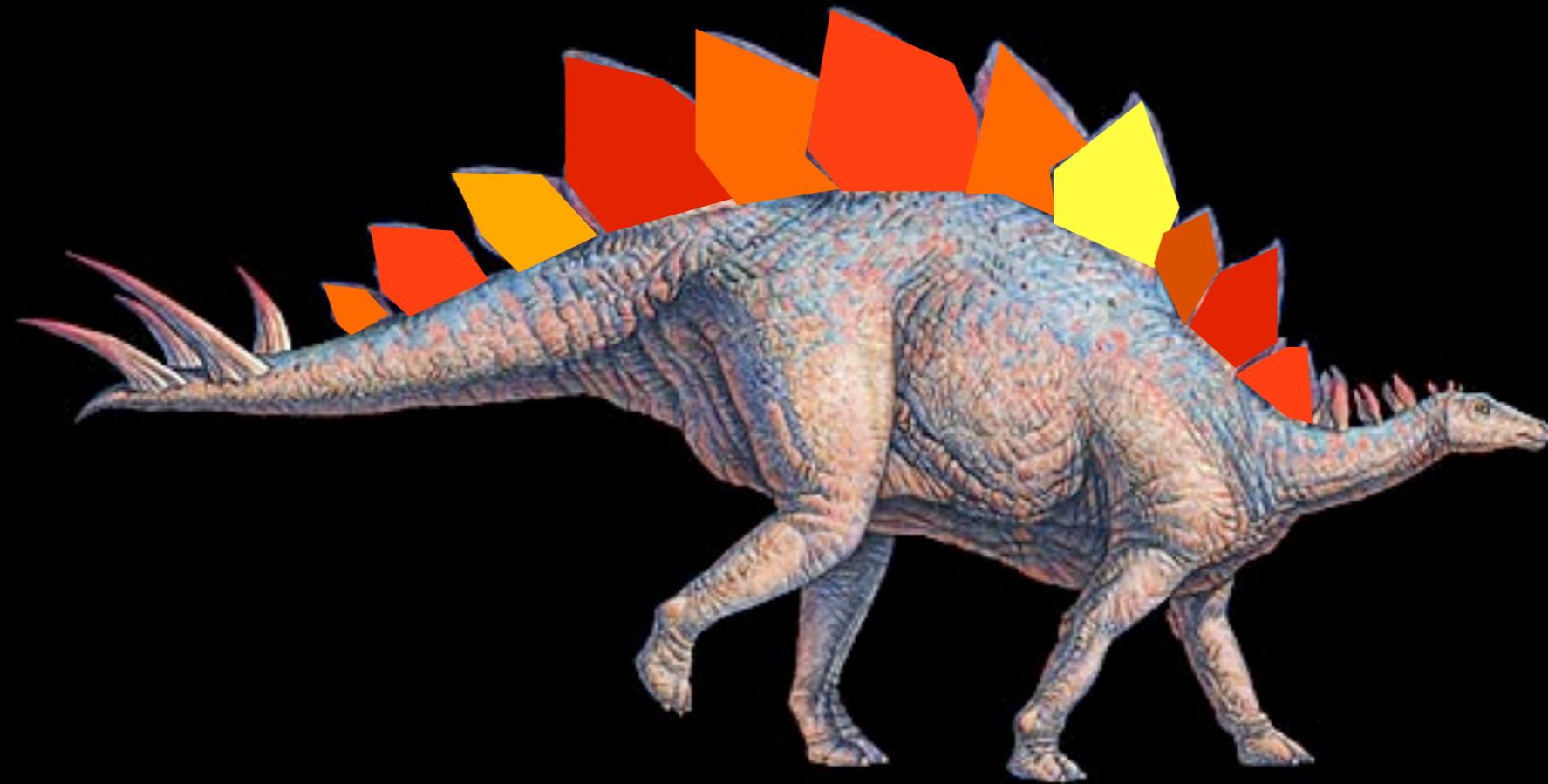
Thermoregulation? Warm up (ectotherms), Cool down (endotherms)

Signaling? positioned for maximal lateral visibility

Sexual Selection

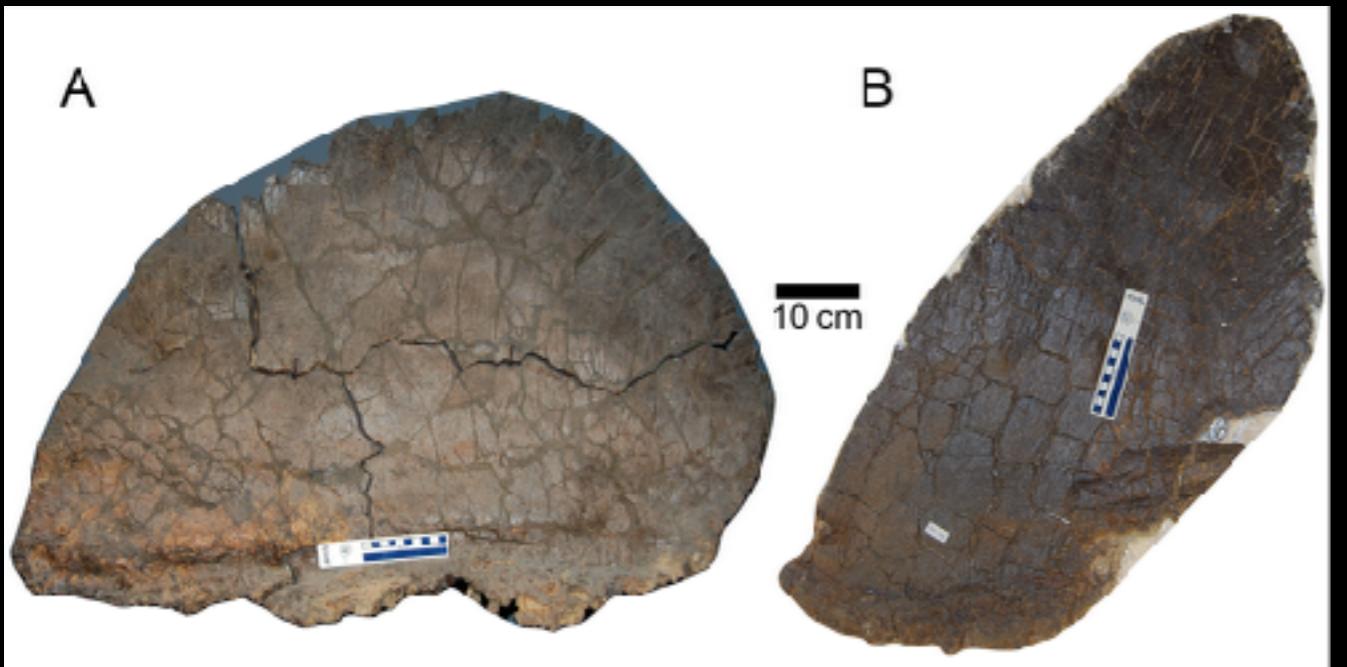
Mate Recognition



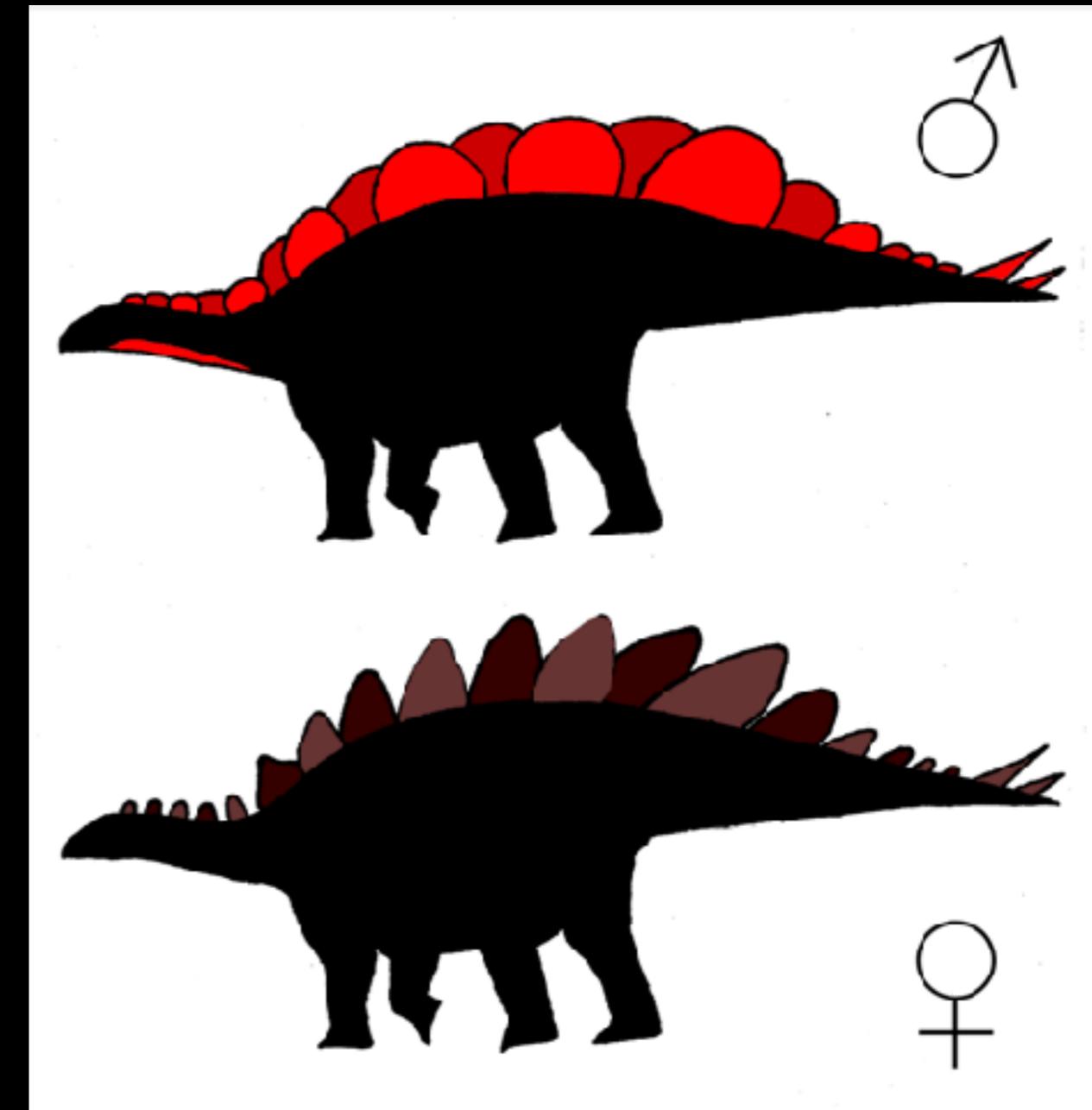


Sexual dimorphism

Differences between males and females
of the same species



****New finding**
published in 2015**

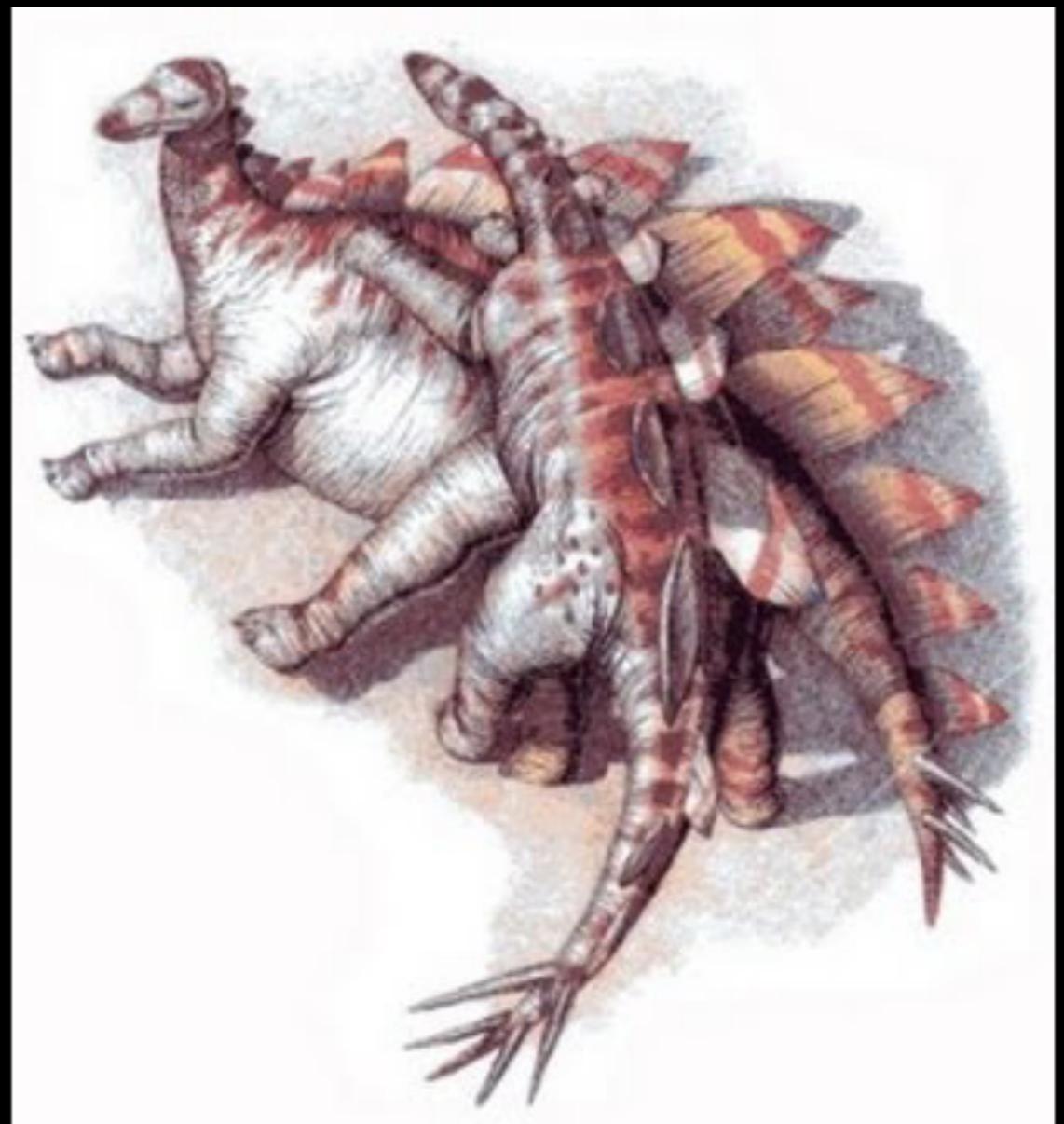


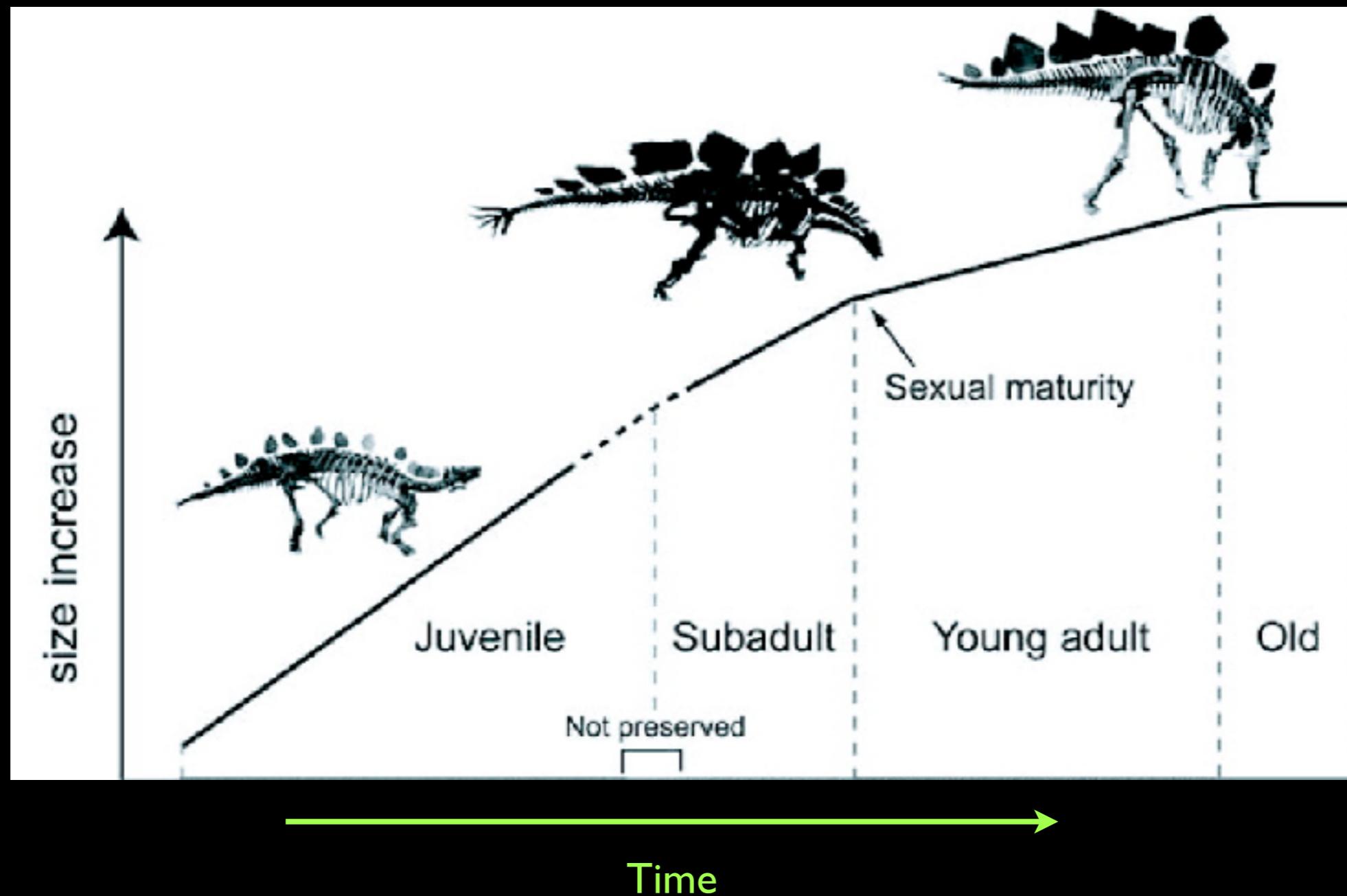
Stegosaurus
Morrison formation, Colorado

Dinosaur Sex

Figuring out how *Stegosaurus* even *could* have mated is a prickly subject. Females were just as well-armored as males, and it is unlikely that males mounted the females from the back. A different technique was necessary. Perhaps they angled so that they faced belly to belly, some have guessed, or maybe, as suggested by Timothy Isles in a recent paper, males faced away from standing females and backed up (a rather tricky maneuver!). The simplest technique yet proposed is that the female lay down on her side and the male approached standing up, thereby avoiding all those plates and spikes. However the *Stegosaurus* pair accomplished the feat, though, it was most likely brief—only as long as was needed for the exchange of genetic material. All that energy and effort, from growing ornaments to impressing a prospective mate, just for a few fleeting moments to continue the life of the species.

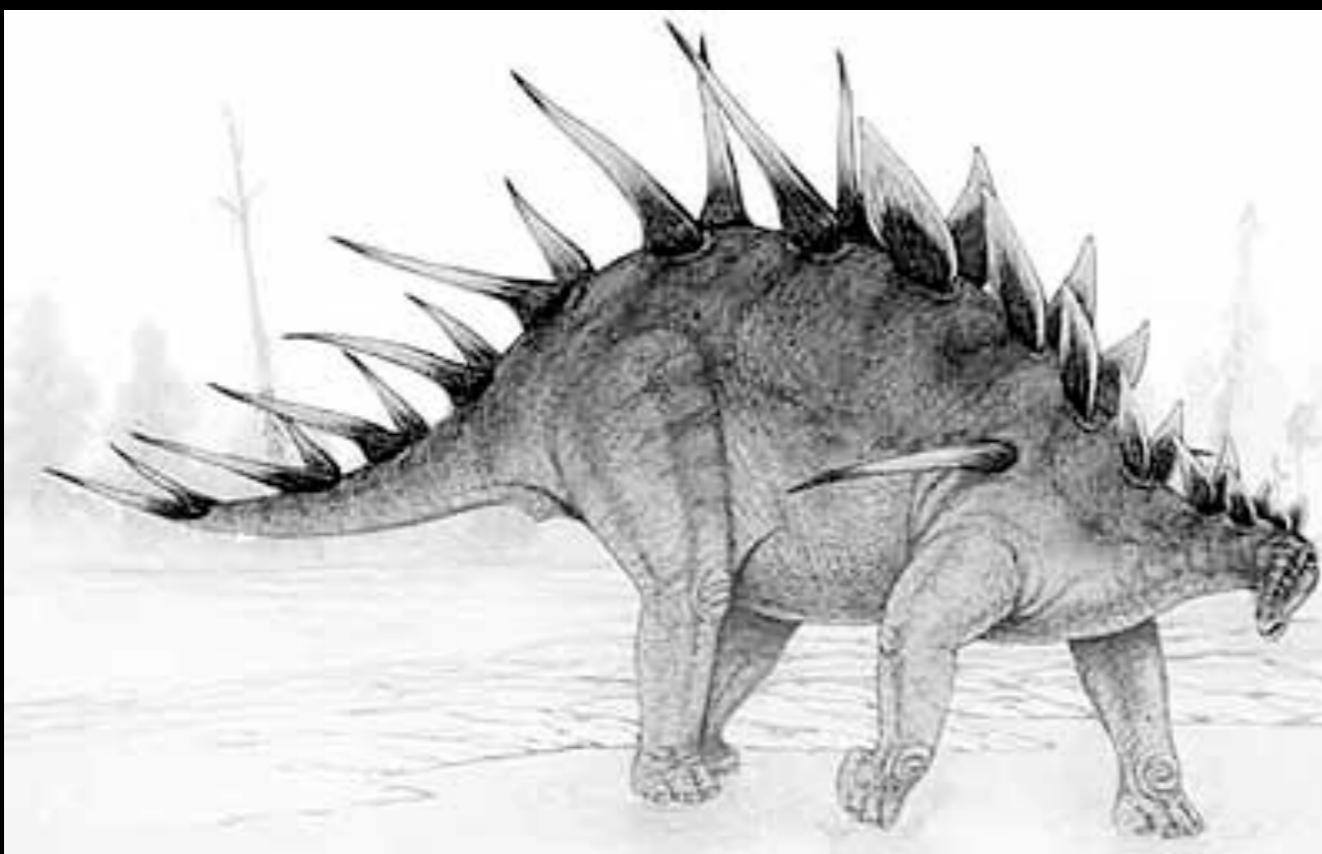
-Brian Switek



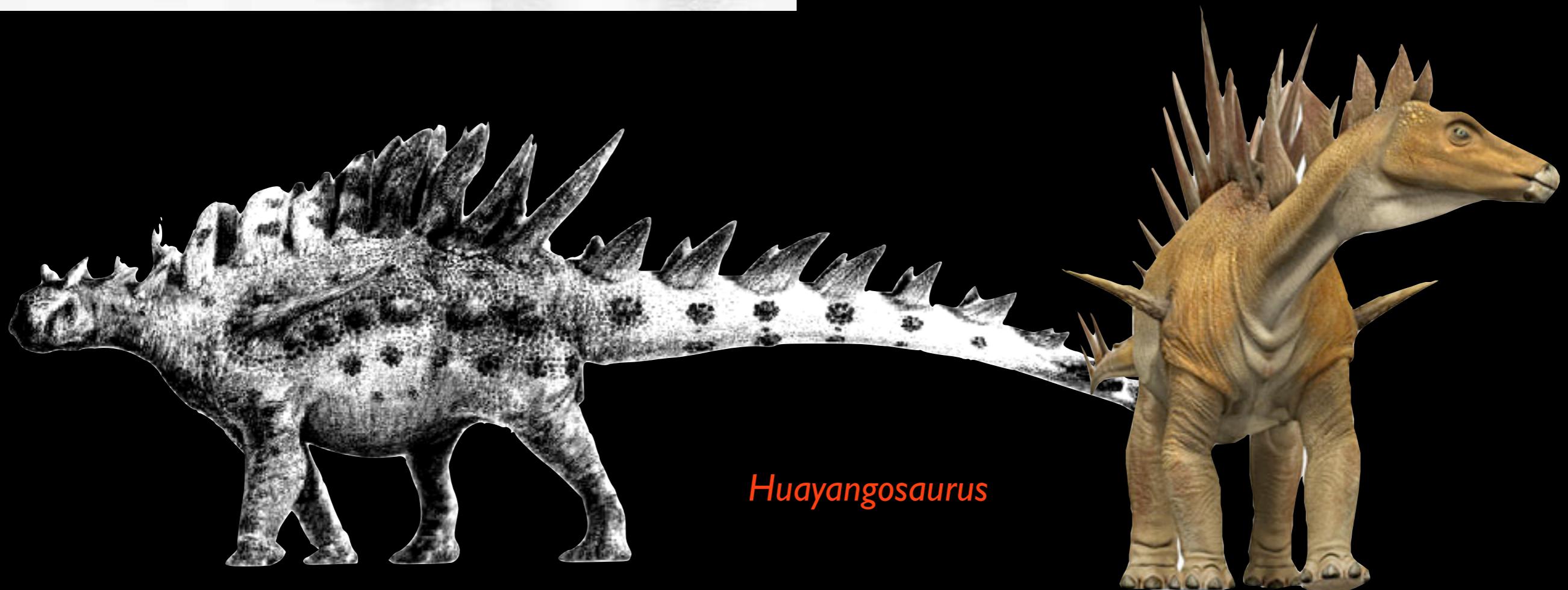


Dermal Armour?

Parascapular spines
Secondarily lost in *Stegosaurus*



Kentrosaurus



Huayangosaurus

Tuojiangosaurus







Distribution in Space and Time

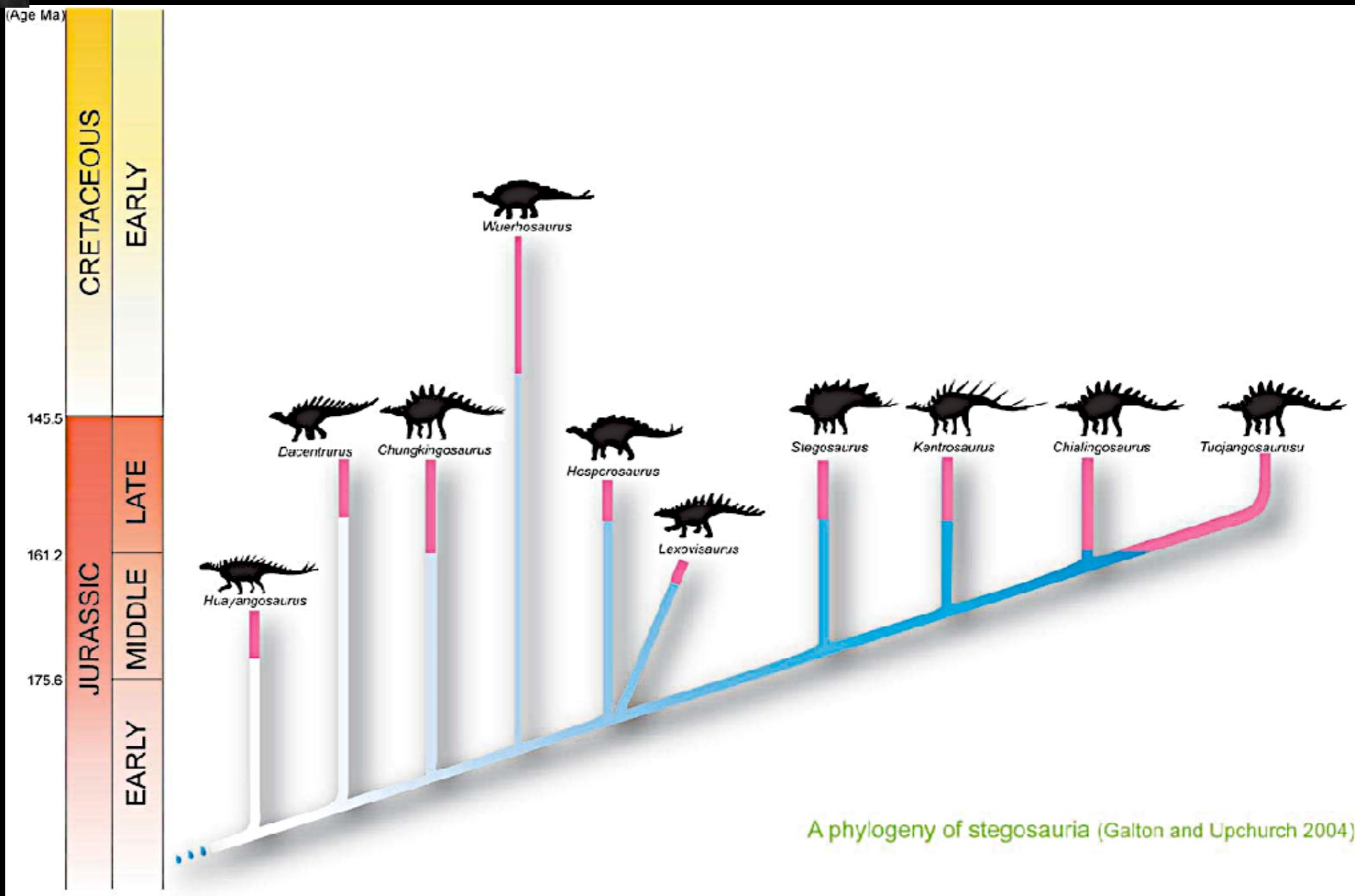
Branched off: Early Jurassic

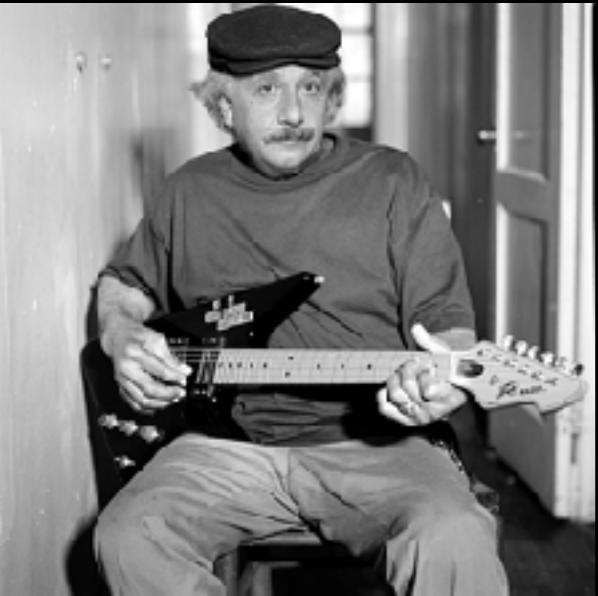
Most abundant/diverse in Late Jurassic

*Never very abundant compared to other
herbivores*



Distribution in Space and Time

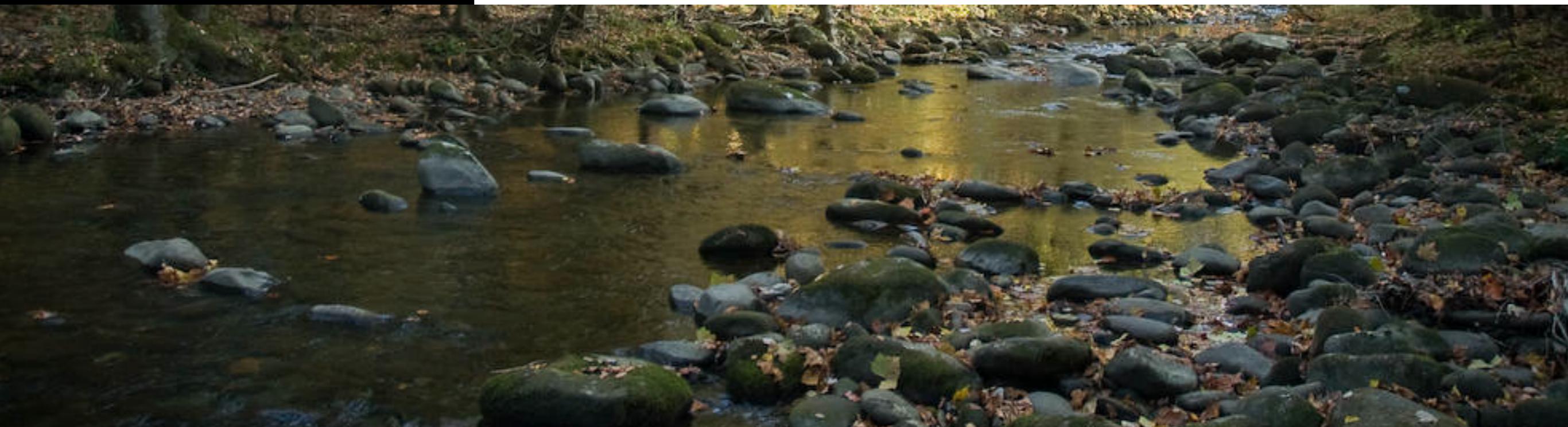
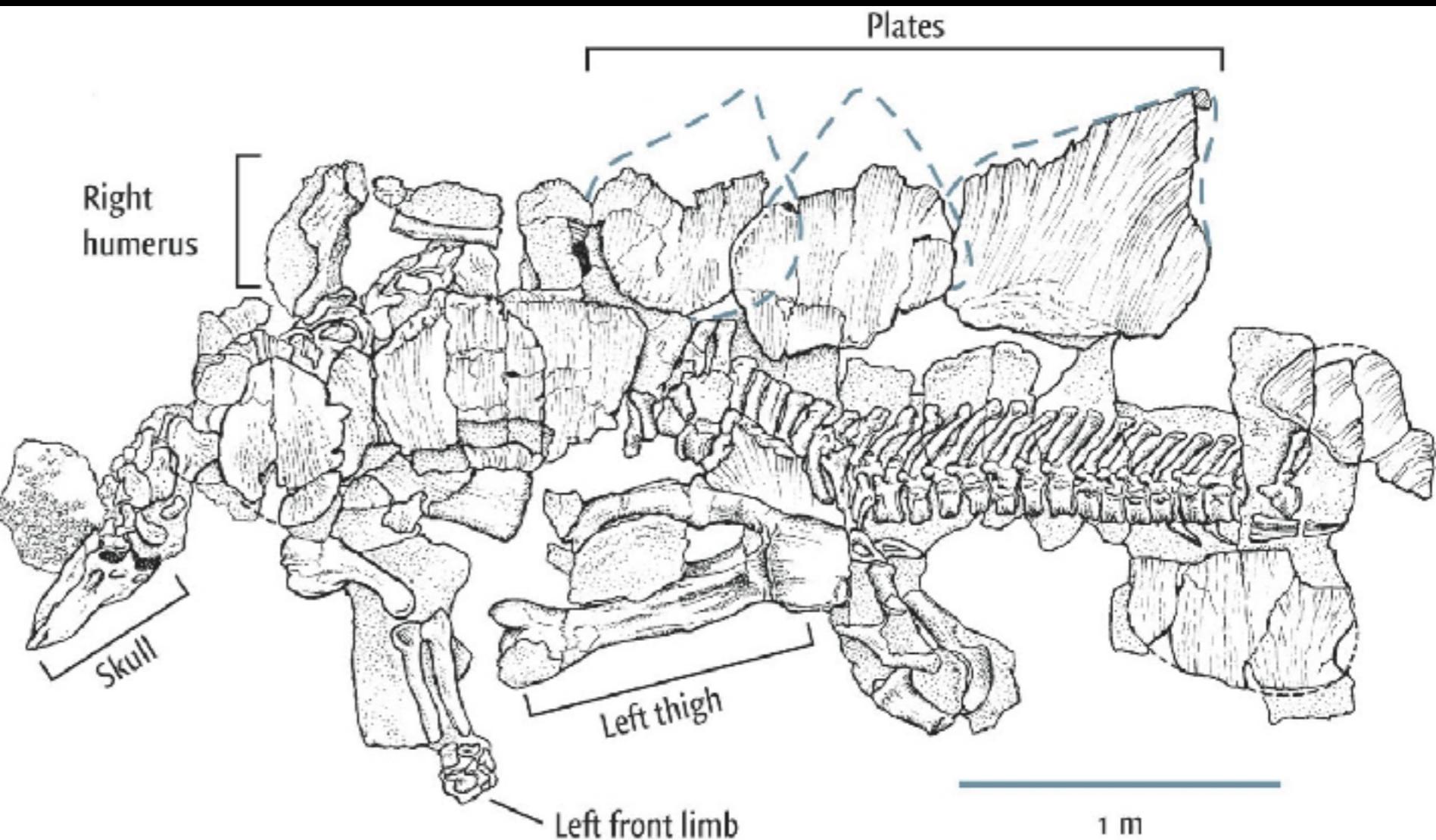




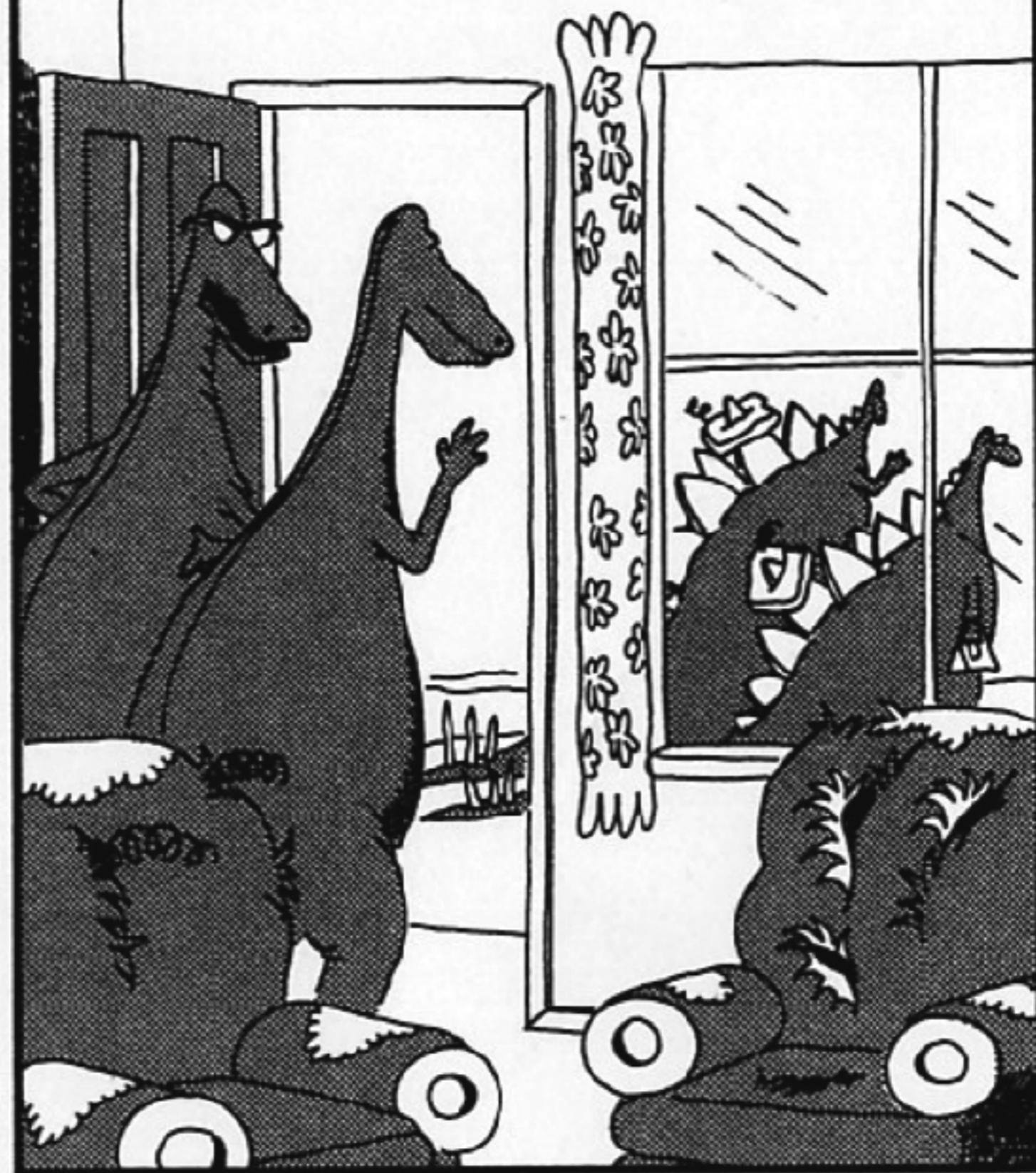
Distribution in Space and Time

early Jur	mid Jur	late Jur	early Cret	late Cret
Europe <i>Emausaurus</i> <i>Scelidosaurus</i>	Europe <i>Lexovisaurus</i> <i>Omosaurus</i> <i>Stegosaurus</i> Asia <i>Huayangosaurus</i>	Europe <i>Astrodon</i> <i>Dacentrurus</i> <i>Lexovisaurus</i> <i>Omosaurus</i> North America <i>Diracodon</i> <i>Hesperosaurus</i> <i>Hypsirophus</i> <i>Stegosaurus</i> Africa <i>Anthodon</i> <i>Chialingosaurus</i> <i>Chungkingosaurus</i> <i>Doryphorosaurus</i> <i>Paleoscincus</i> <i>Tuojiangosaurus</i>	Europe <i>Craterosaurus</i> <i>Regnosaurus</i> Africa <i>Anthodon</i> <i>Paleoscincus</i> <i>Paranthodon</i> Asia <i>Wuerhosaurus</i> <i>Monkonosaurus</i>	Asia <i>Dravidosaurus??</i>

Distribution in Space and Time



Lanom



"Well, that does it! Look at our furniture!
The Shuelers have visited us for the last time!"