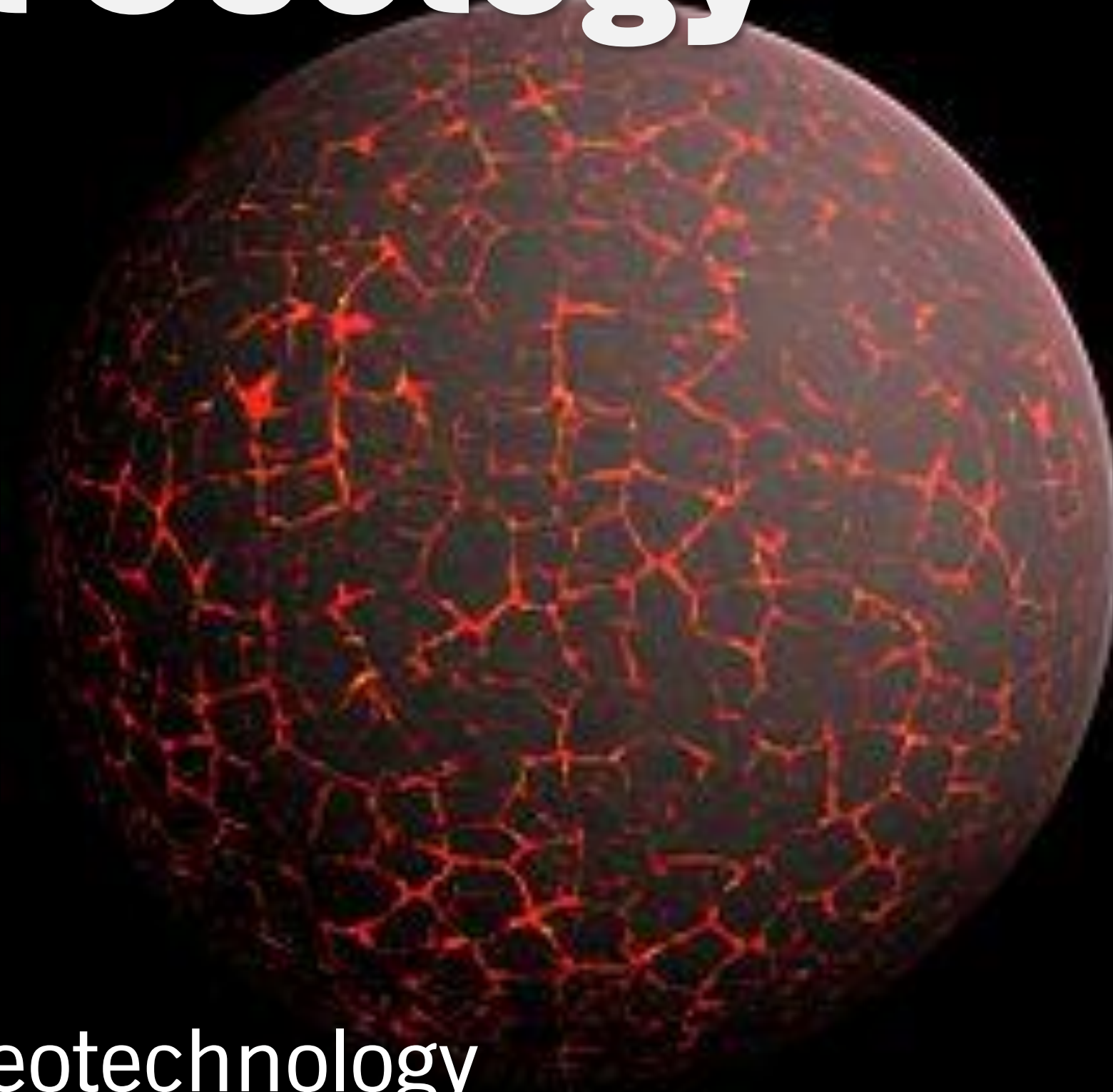
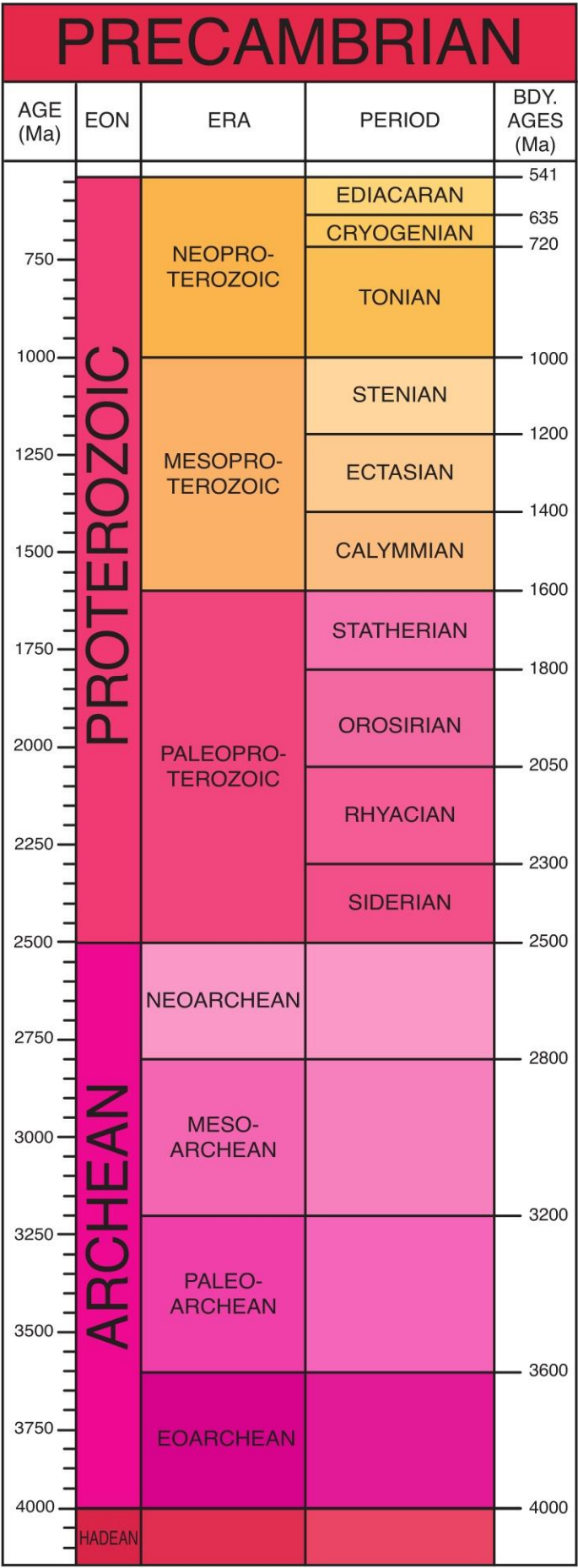
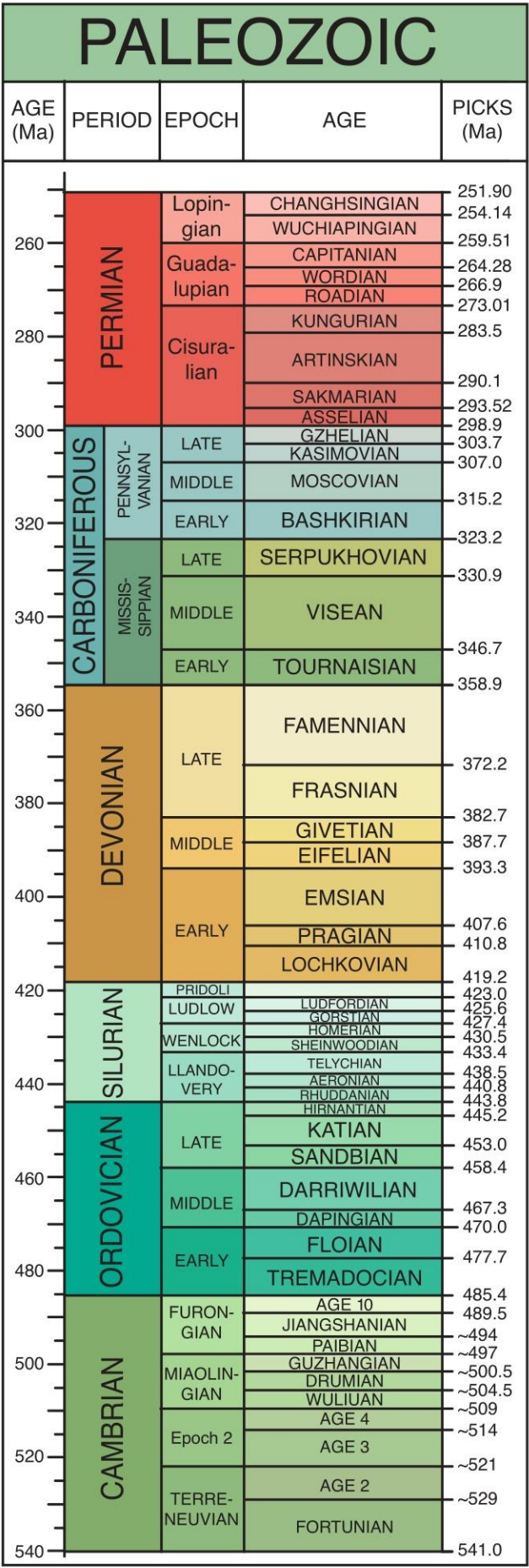
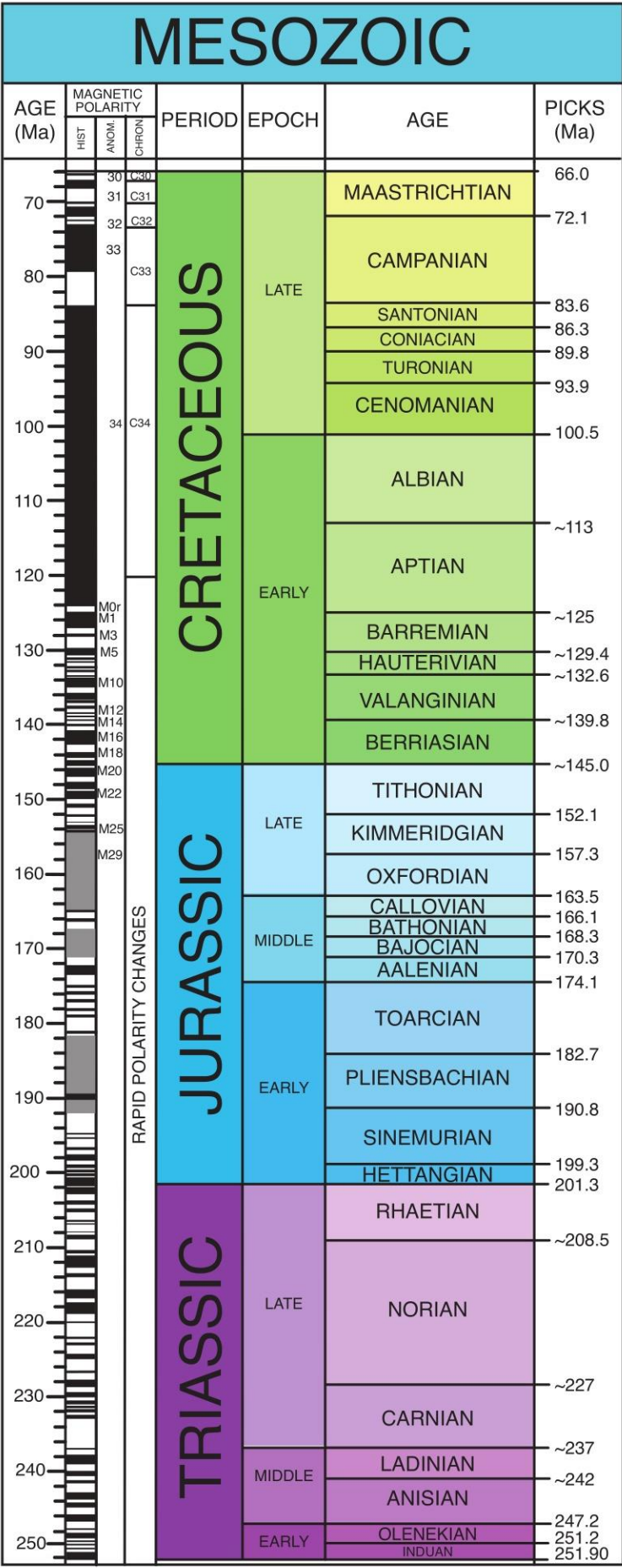
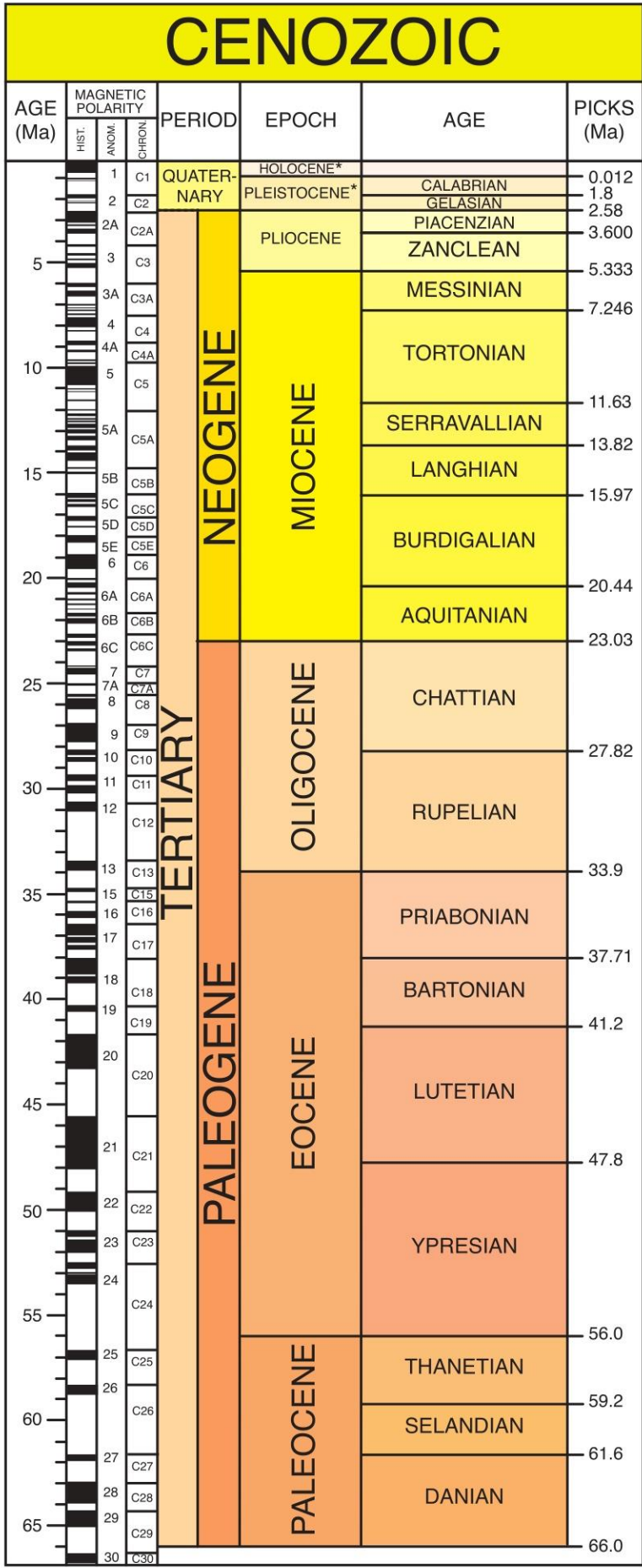


Historical Geology



กฤติกา ตระกูลงาม

Technical English for Geotechnology



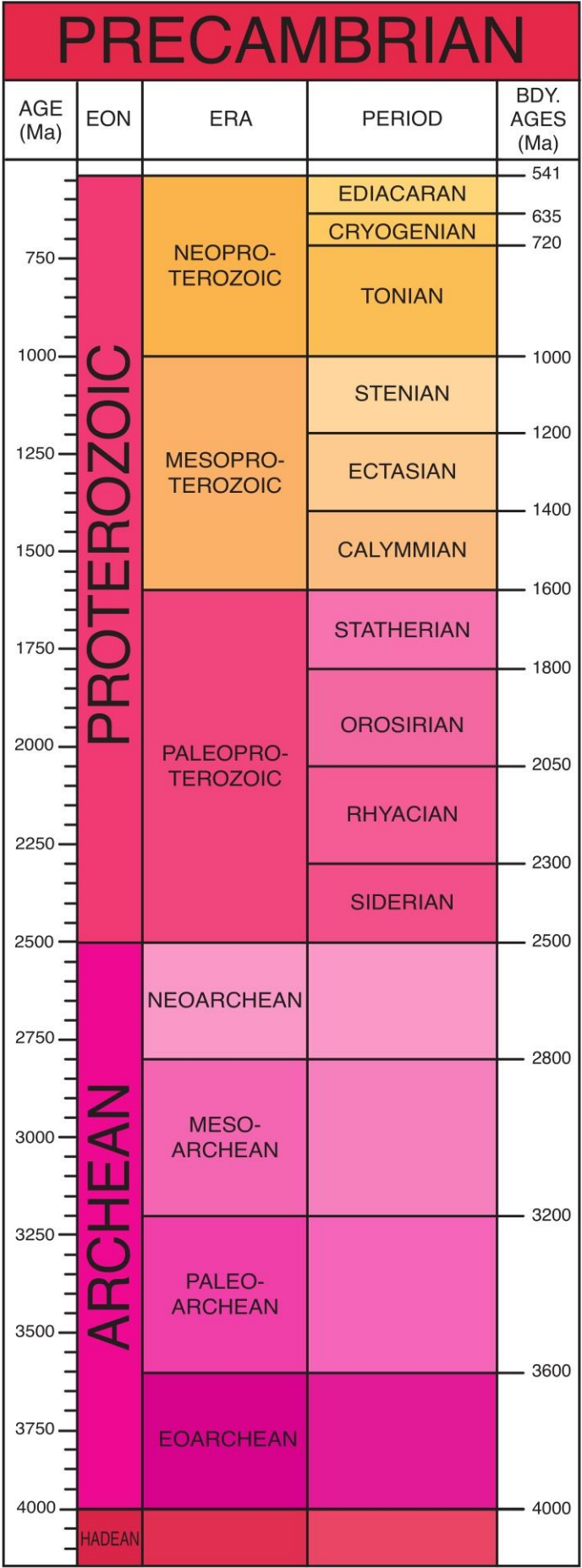
Hades God of the dead

Hadean
4000 Ma

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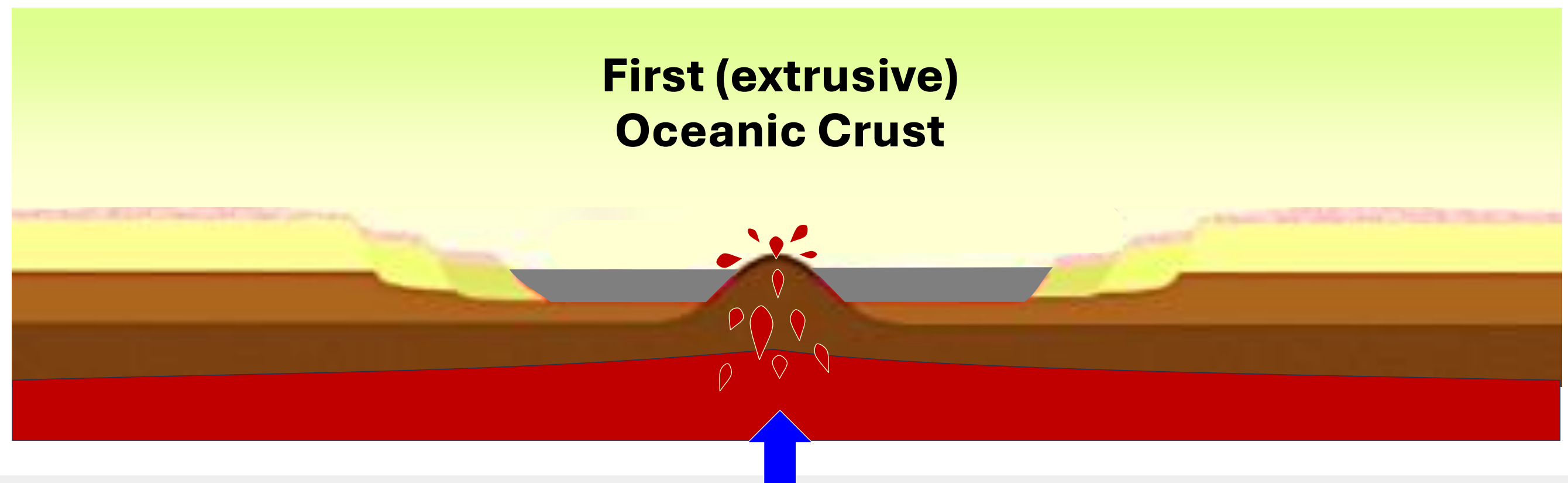
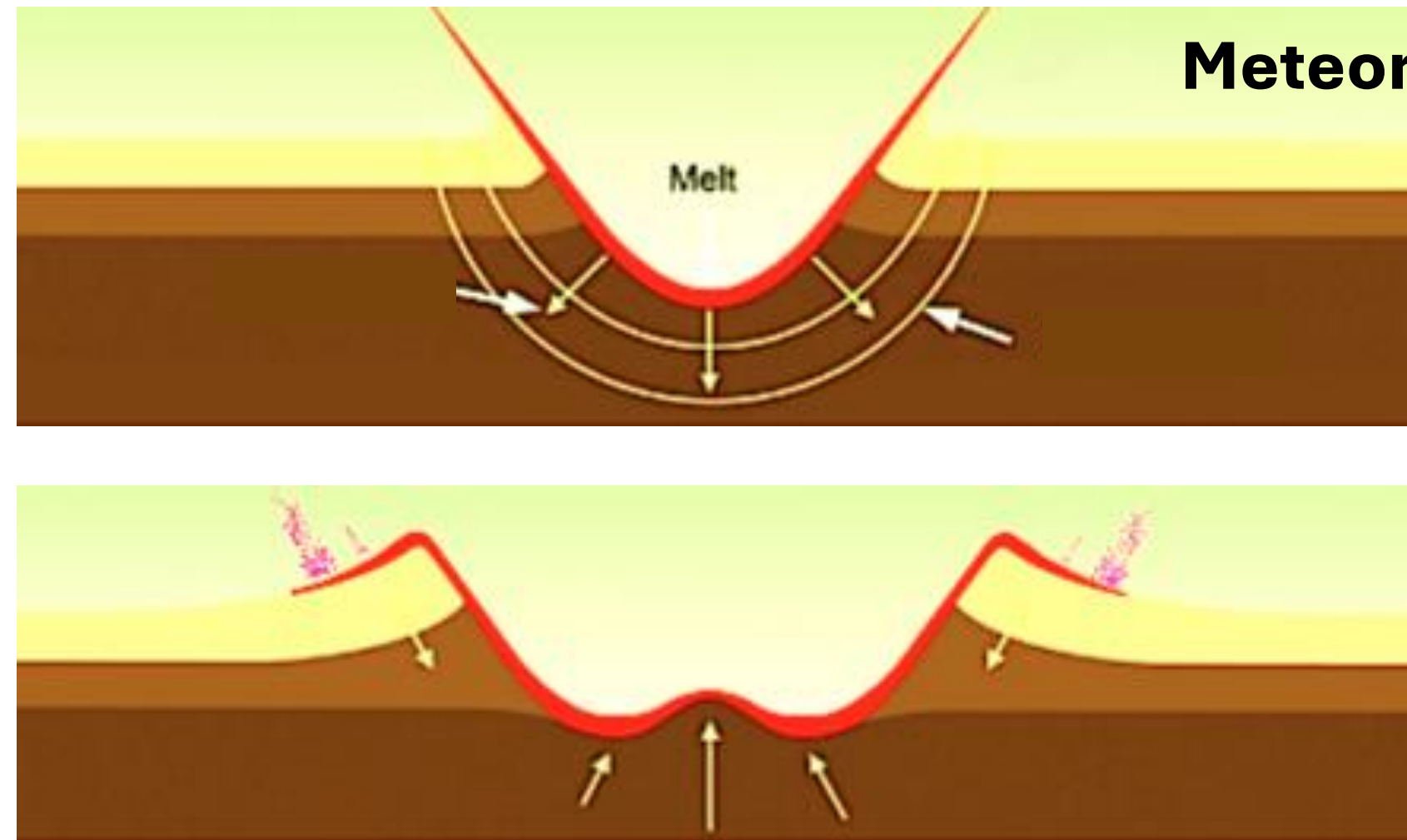
Archean (Eon)

First rock on earth



Archean
4,000-2,500 Ma

Primordial Crust



Komatiite

<https://skfb.ly/6SZwW>

Fe + Mn rich

Spinifex texture



Quartz-Pebble Metaconglomerate

(Jack Hills Quartzite,
Archean, 2.65 to 3.05 Ga;
Jack Hills, Western Australia)

Early sedimentary rock on earth

<https://opengeology.org/historicalgeology/case-studies/earths-oldest-rocks/>





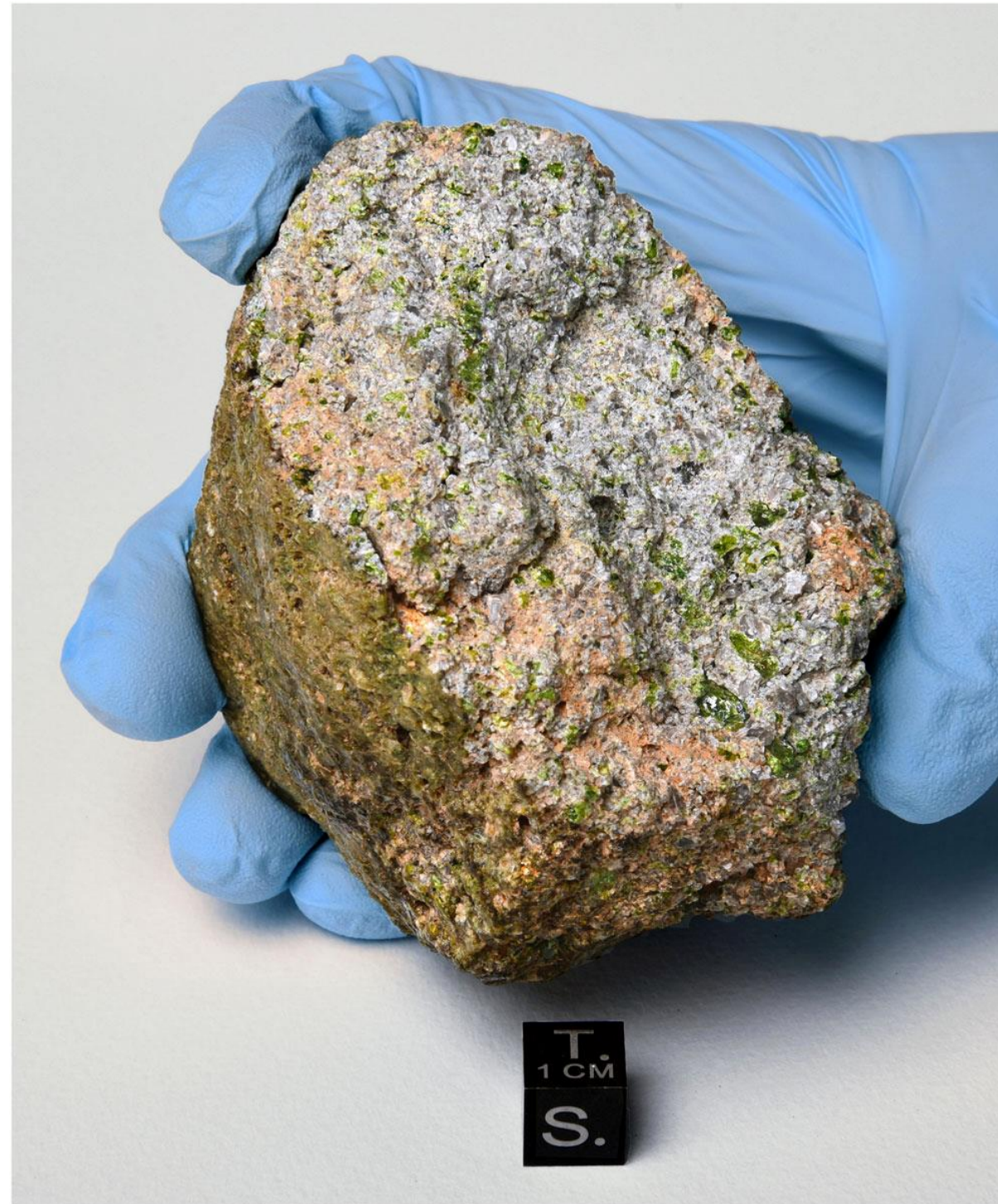
Acasta Gneiss

4.031 $\pm$ 0.003 billion years
Northwest Canada

Early intrusive igneous rock
on earth

Bowring, Samuel A.; Williams, Ian S. (1999). "Priscoan (4.00–4.03 Ga) orthogneisses from northwestern Canada". *Contributions to Mineralogy and Petrology*. 134 (1): 3. doi:10.1007/s004100050465. S2CID 128376754

Oldest Extra-terrestrial Rock



Meteorite older than the Earth

Meteorite Northwest Africa 11119 (NWA 11119)

Age: 4.5648 ± 0.0003 billion years



Stromatolite (3.5Ga) Australia

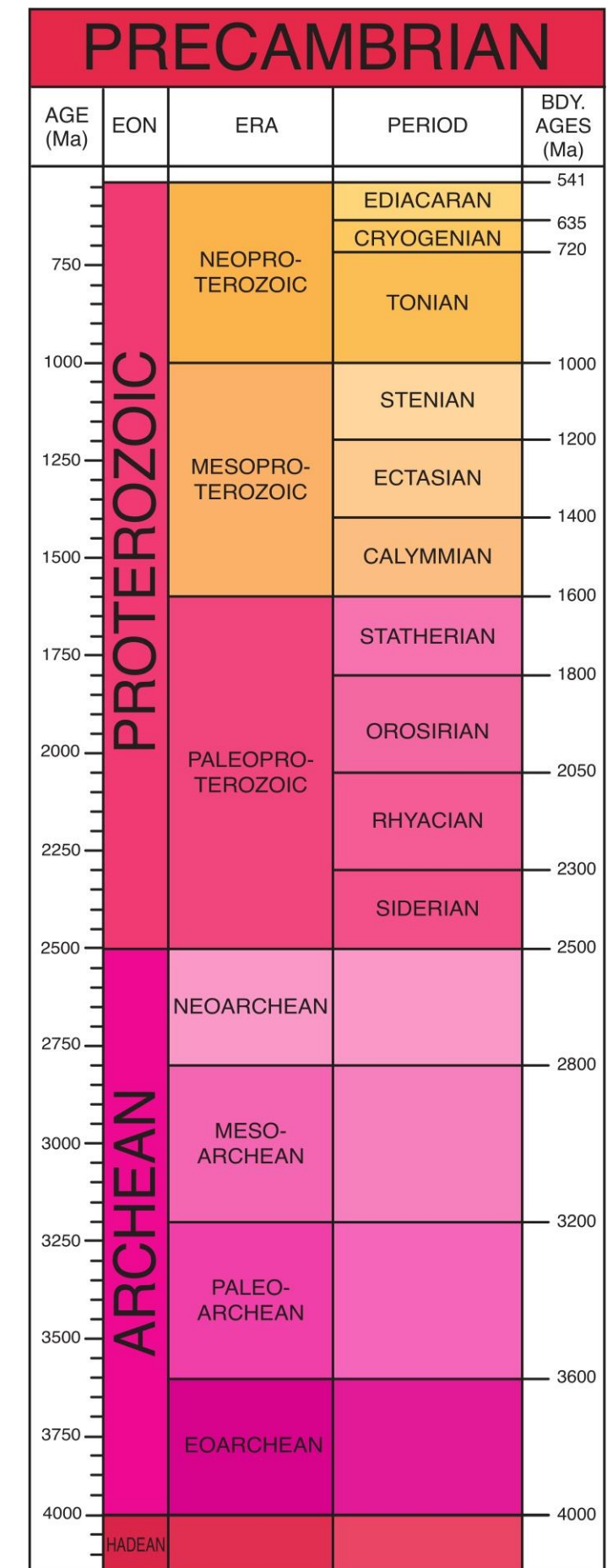
produced by the activity of
ancient cyanobacteria

Rocks

Stromatolite 3.5 Ga

Ocean 3.8 Ga

Komatiite 4.4-3.8 Ga



Archean
4,000-2,500 Ma



**Stromatolite (3.5Ga)
Australia**

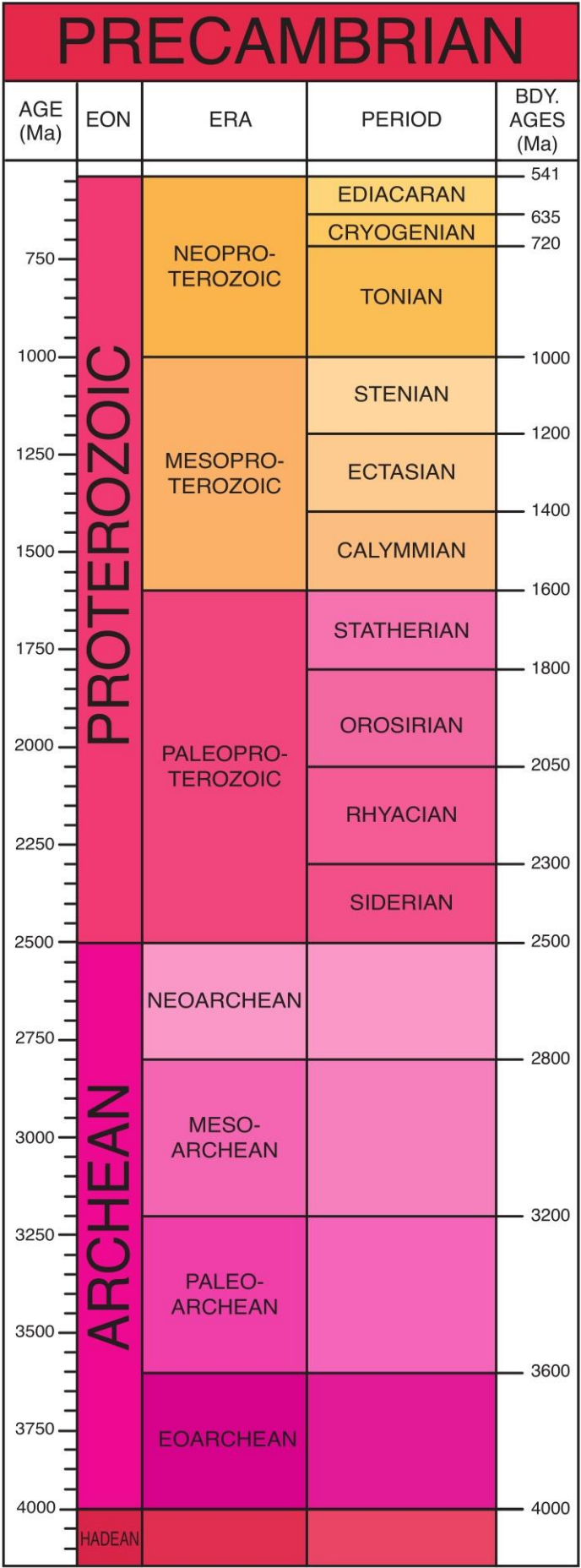
produced by the activity of
ancient cyanobacteria

Rocks

Stromatolite 3.5 Ga

Ocean 3.8 Ga

Komatiite 4.4-3.8 Ga



**The Great
Oxidation Event**

← **GOE 2.5Ga**

Archean
4,000-2,500 Ma



Ediacara fauna (540 Ma)
Australia

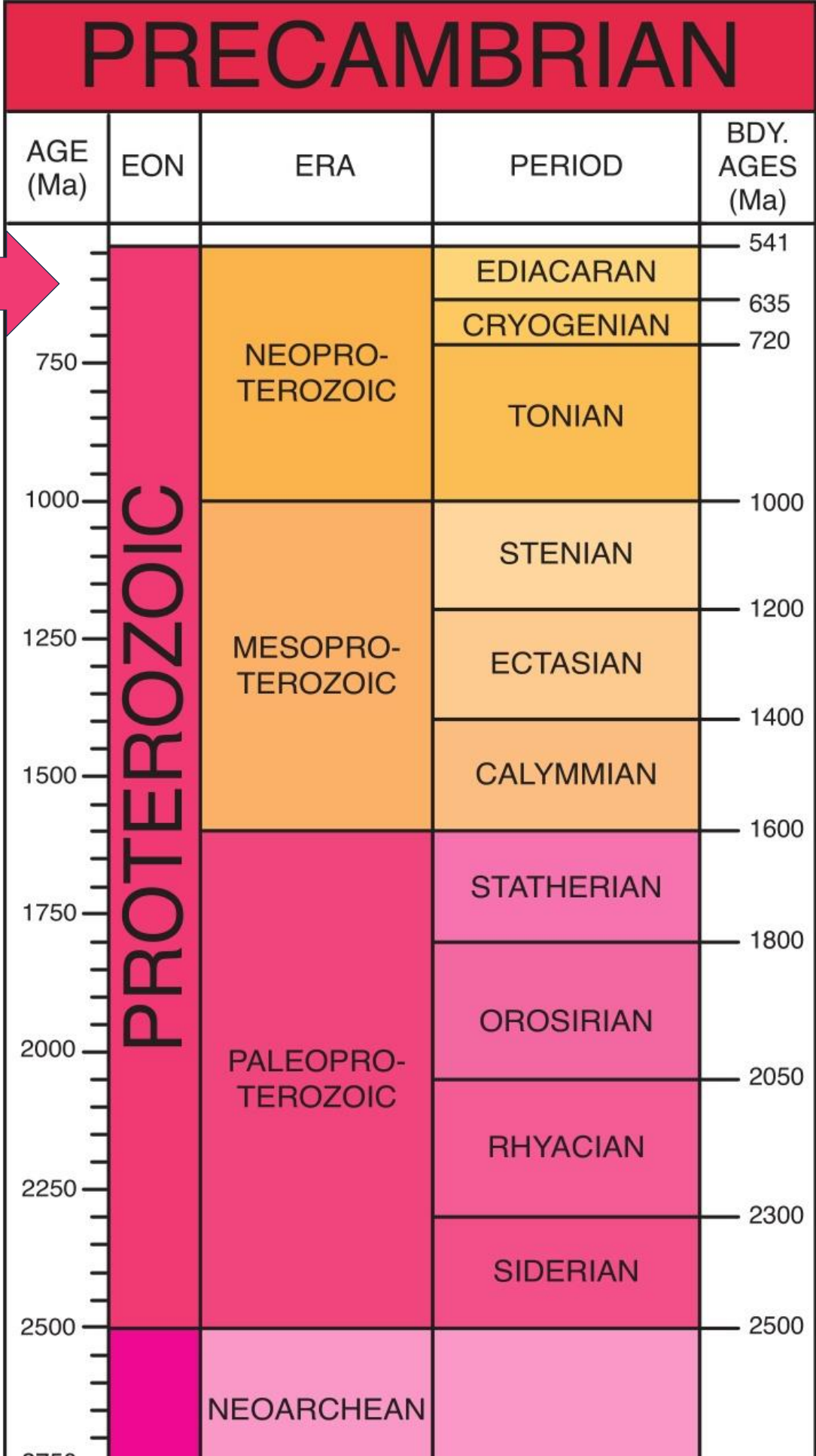
First multi-cell animal fossil
Ediacara fauna

Banded-iron formation

Oxygen-dependent life



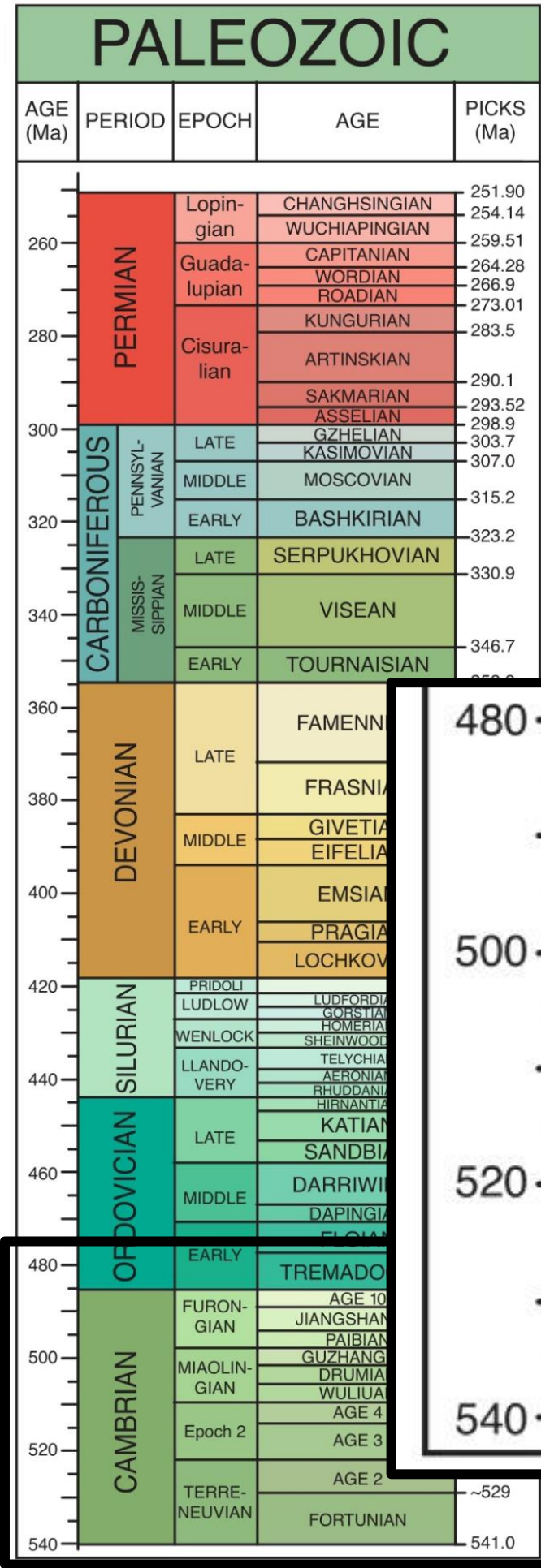
Banded Iron Formation
Australia



Proterozoic
2,500-500 Ma

Cambrian

First vertebrate

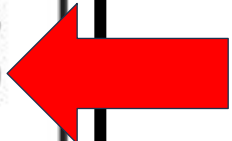
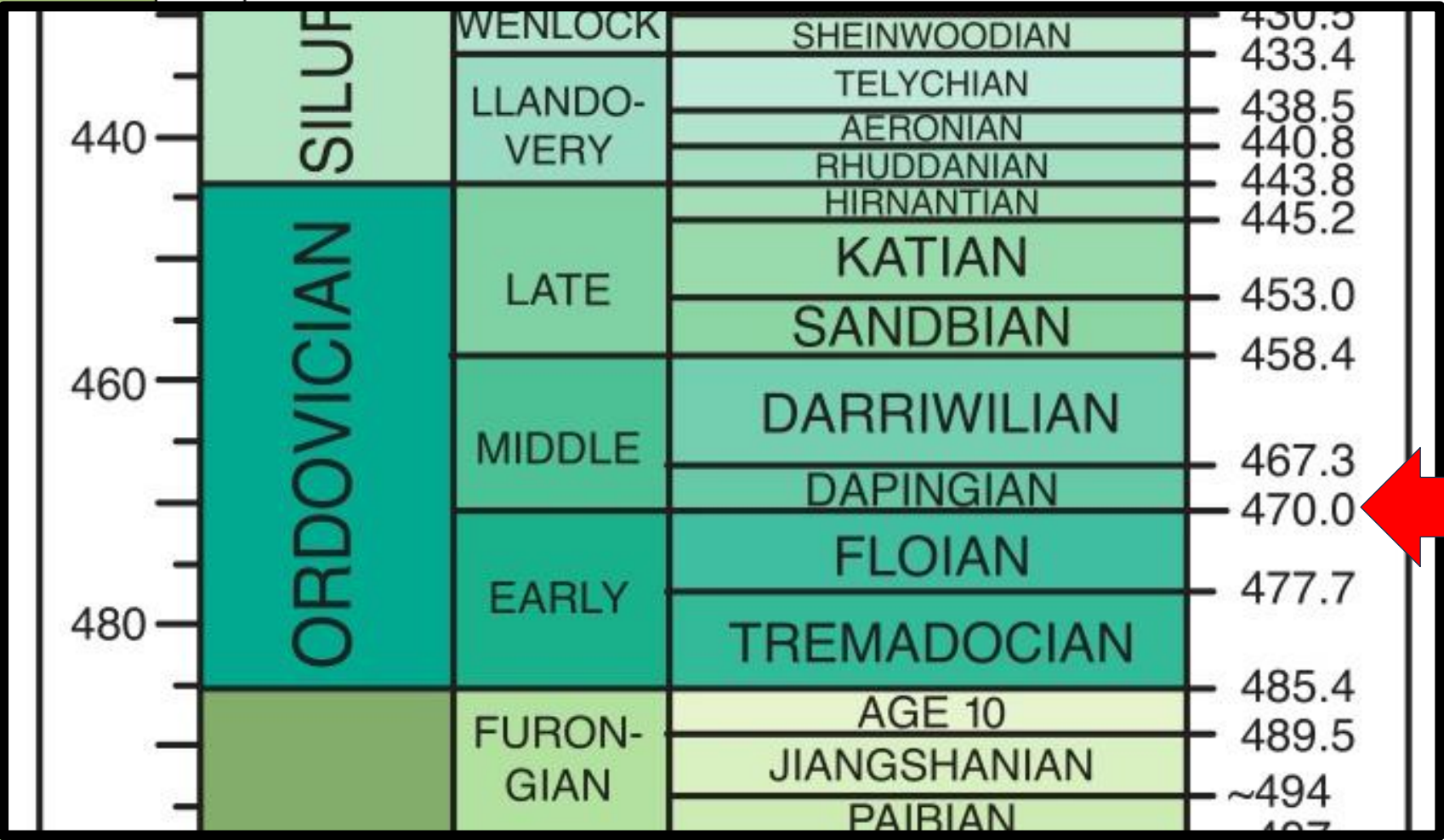
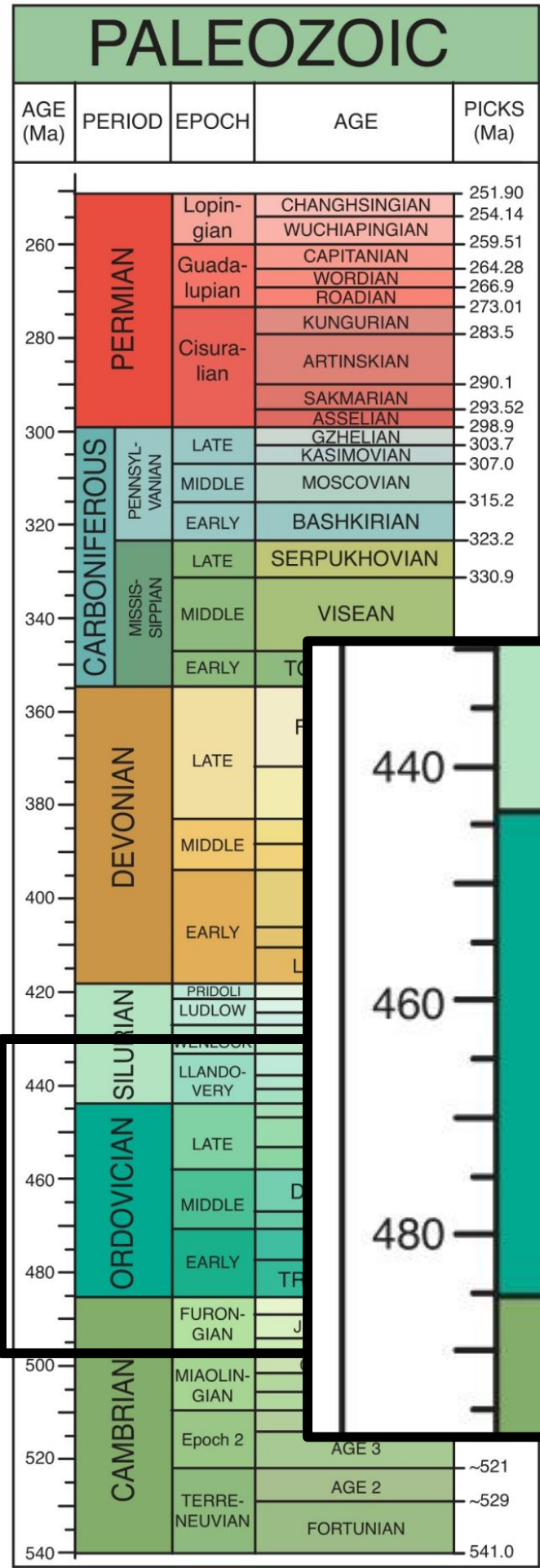


Trilobite
525–500 Ma

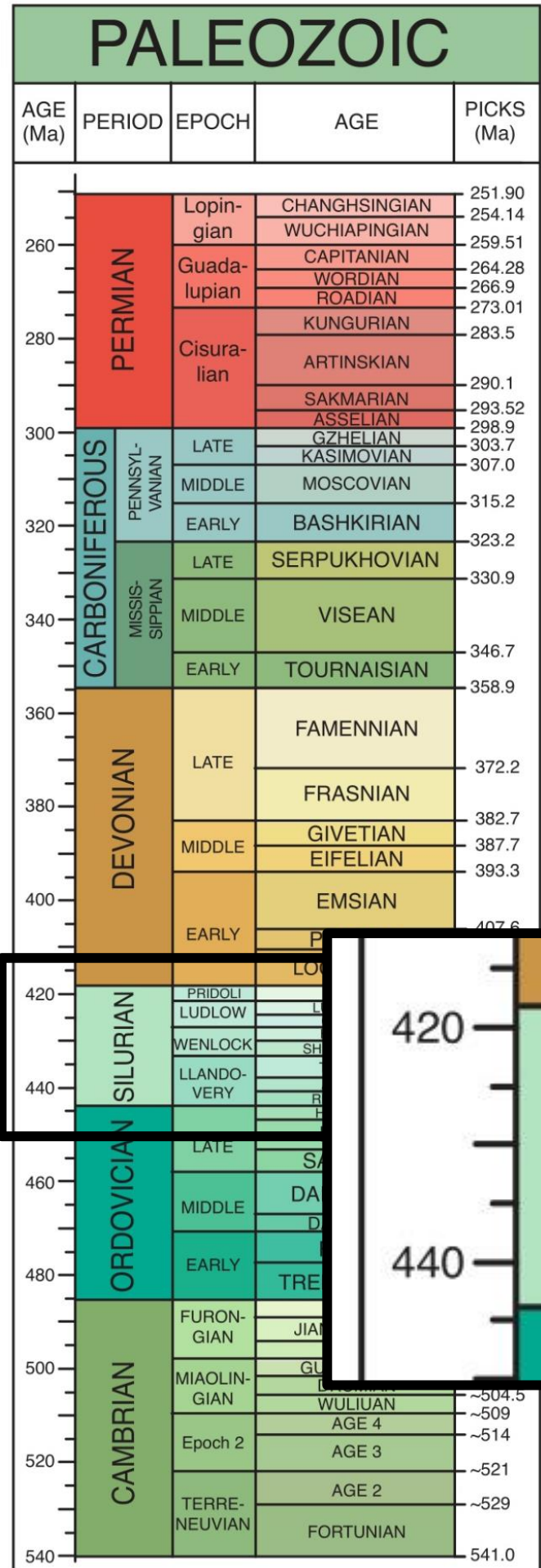
Ordovician

First land plants

Liverwort
A plant that appeared in the Ordovician period



Spores of plants
(470 Ma)



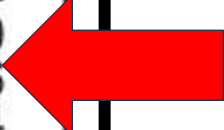
Pneumodesmus newmani 428Ma

Scotland
(Millipede)



Silurian

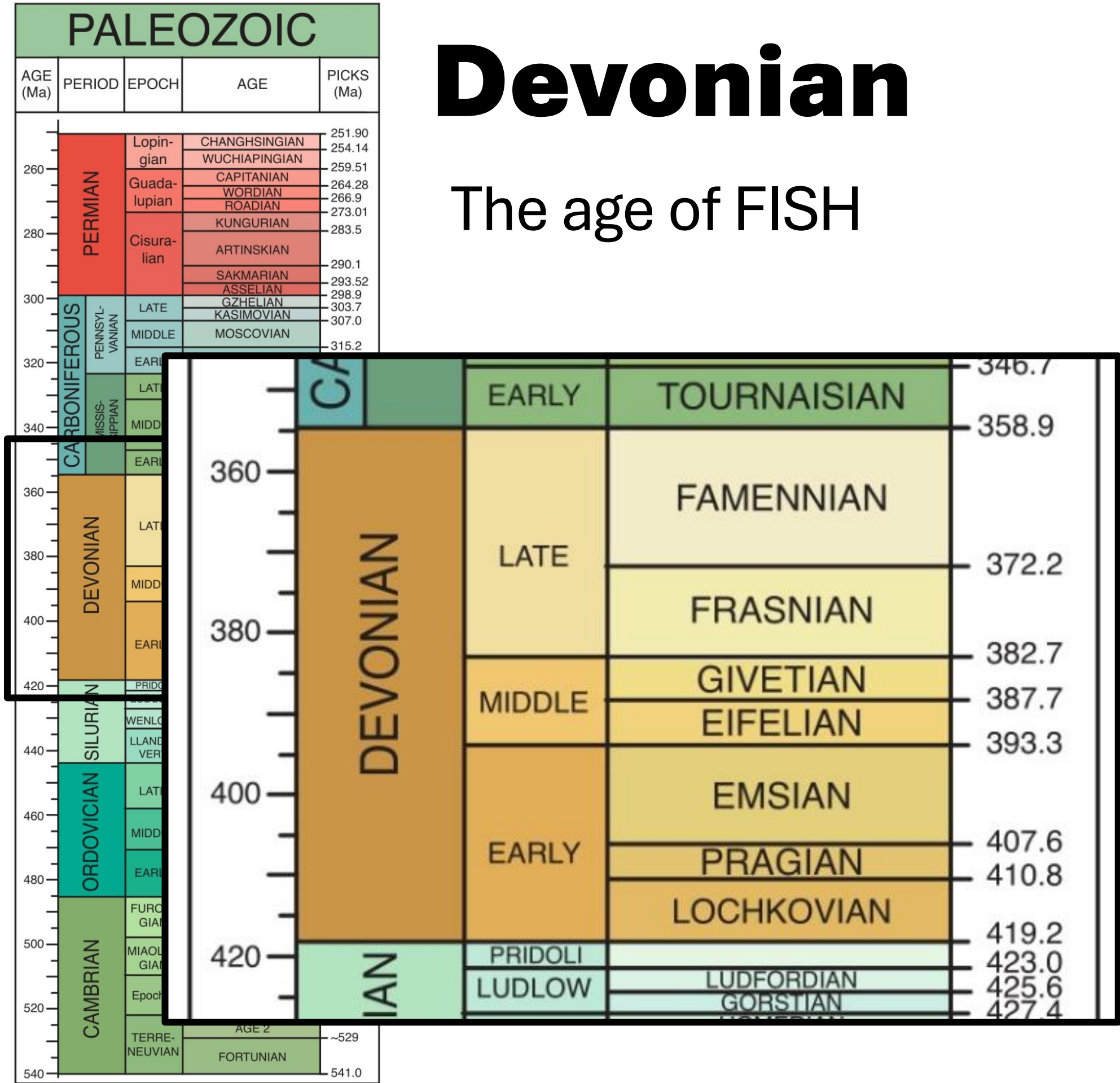
First land animal



Pneumodesmus newmani fossil
(428 Ma)

Devonian

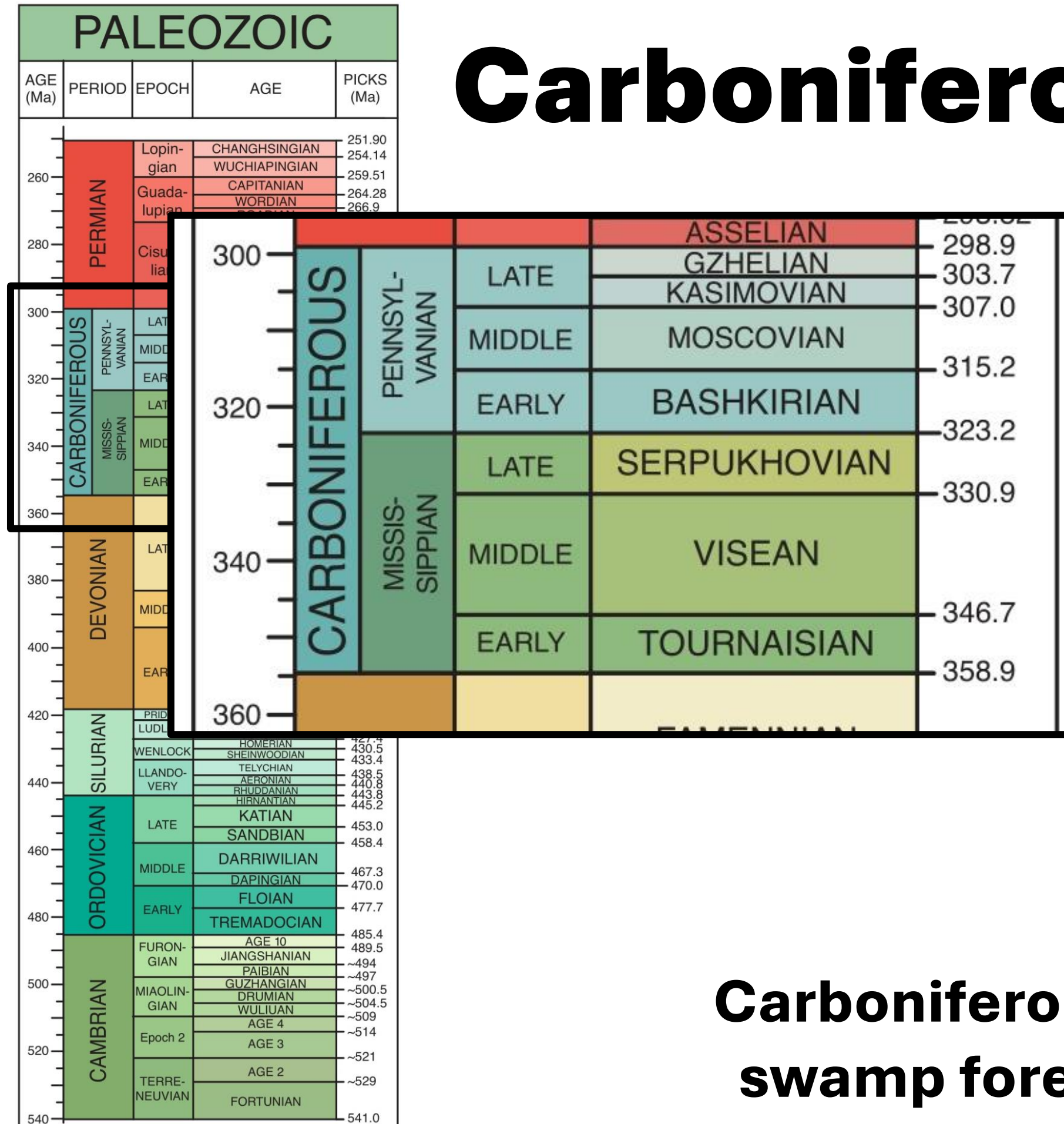
The age of FISH



Tristichopterus alatus
Fish fossil

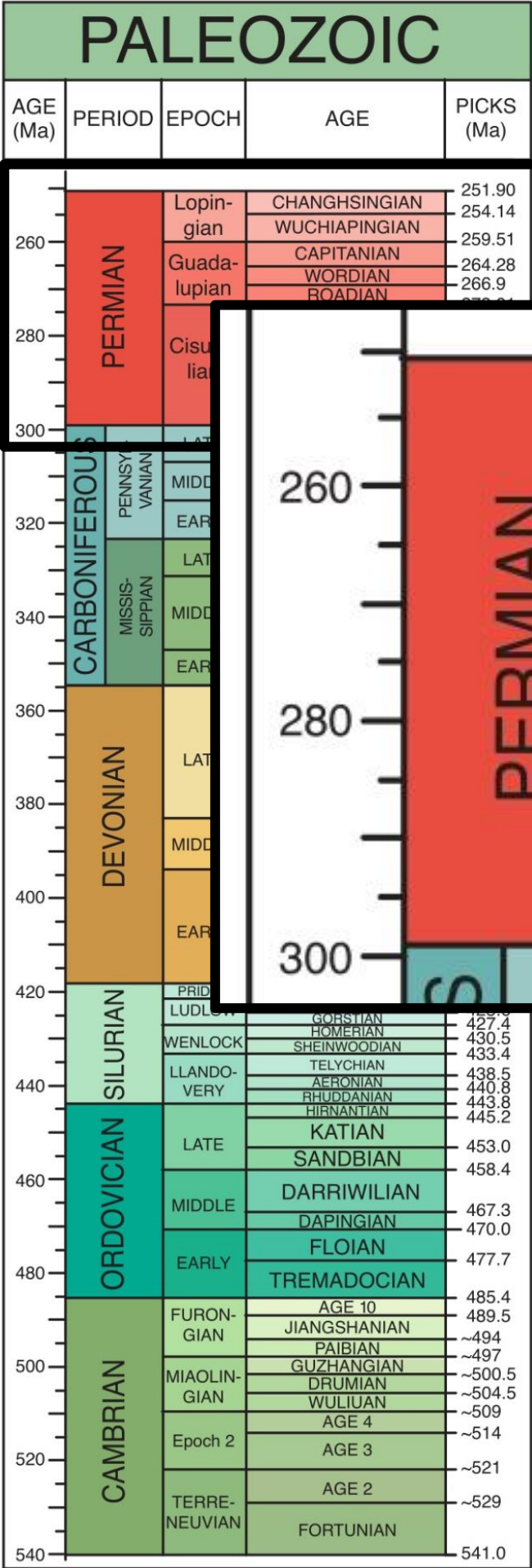
Carboniferous

The age of Carbon (Coal)

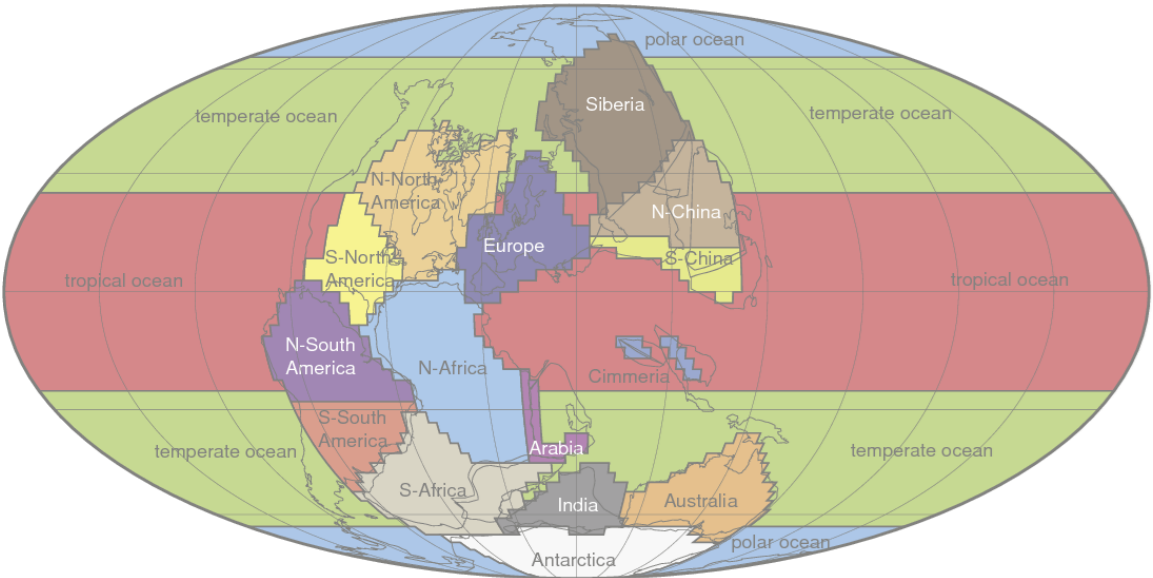
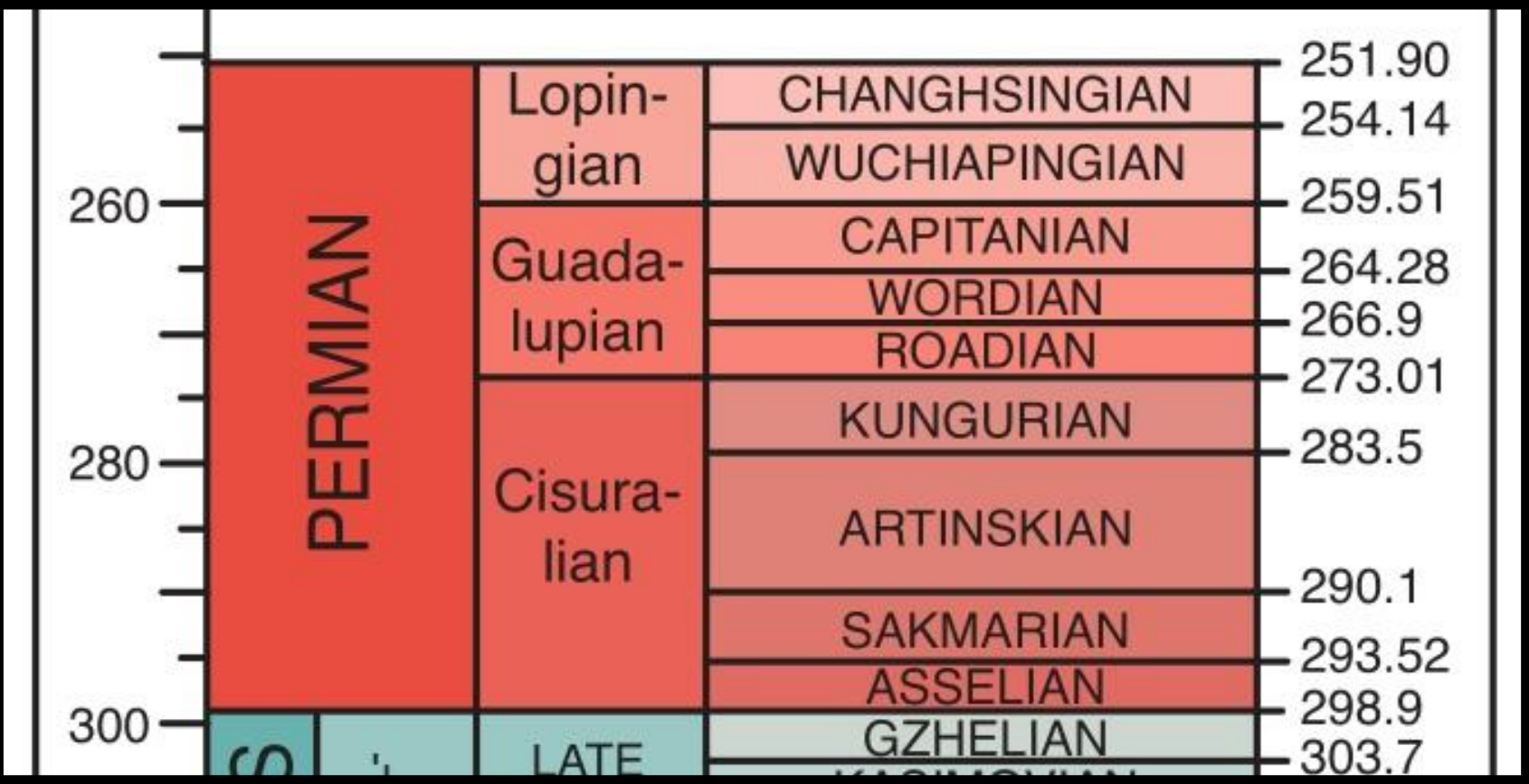


Carboniferous swamp forest





Permian



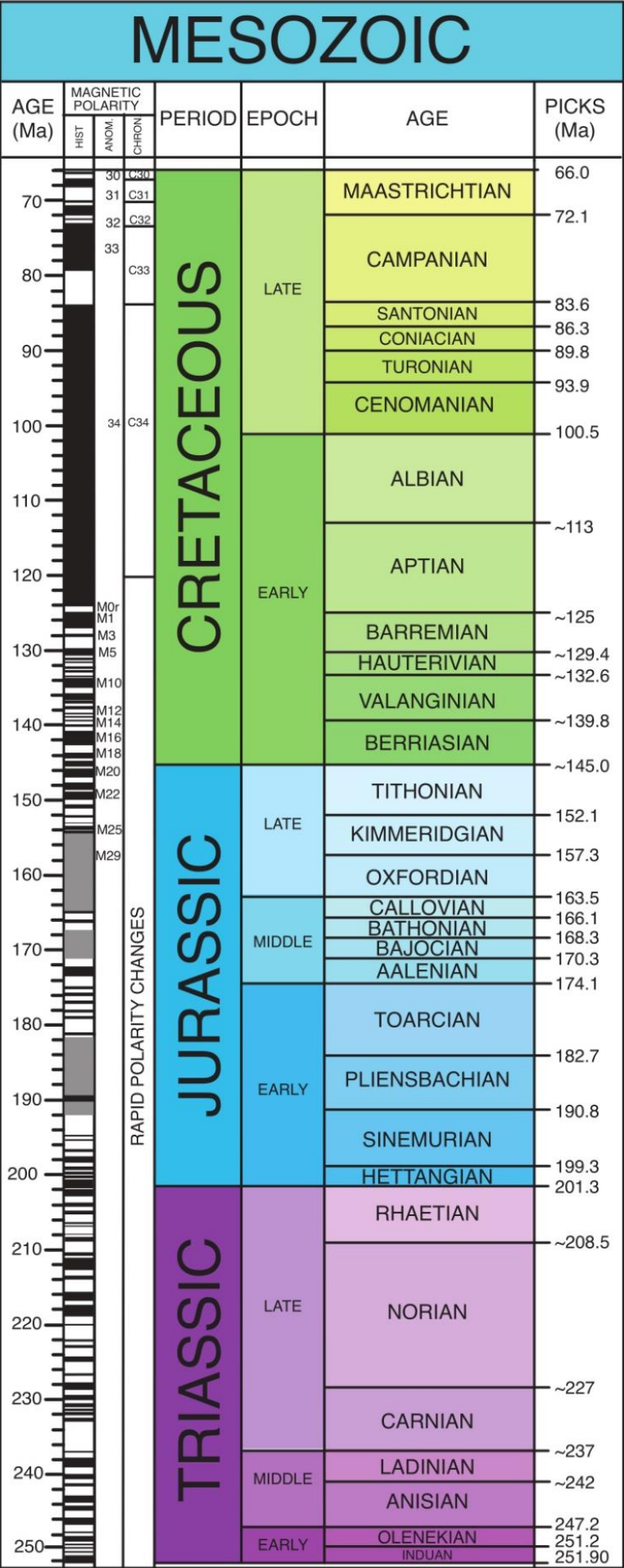
Permian Climatic Belts

similar to earth’s current weather pattern

Developed climatic belts

Largest extinction

90% of marine species disappeared from the fossil record



Mesozoic

250-70 Ma

Stable climate

Warm temperature

Separation of Pangea



Gymnosperm

Most abundant plant in this Era
(still living)

สิ่งเกิดขั้วแม่เหล็ก Magnetic Reversal

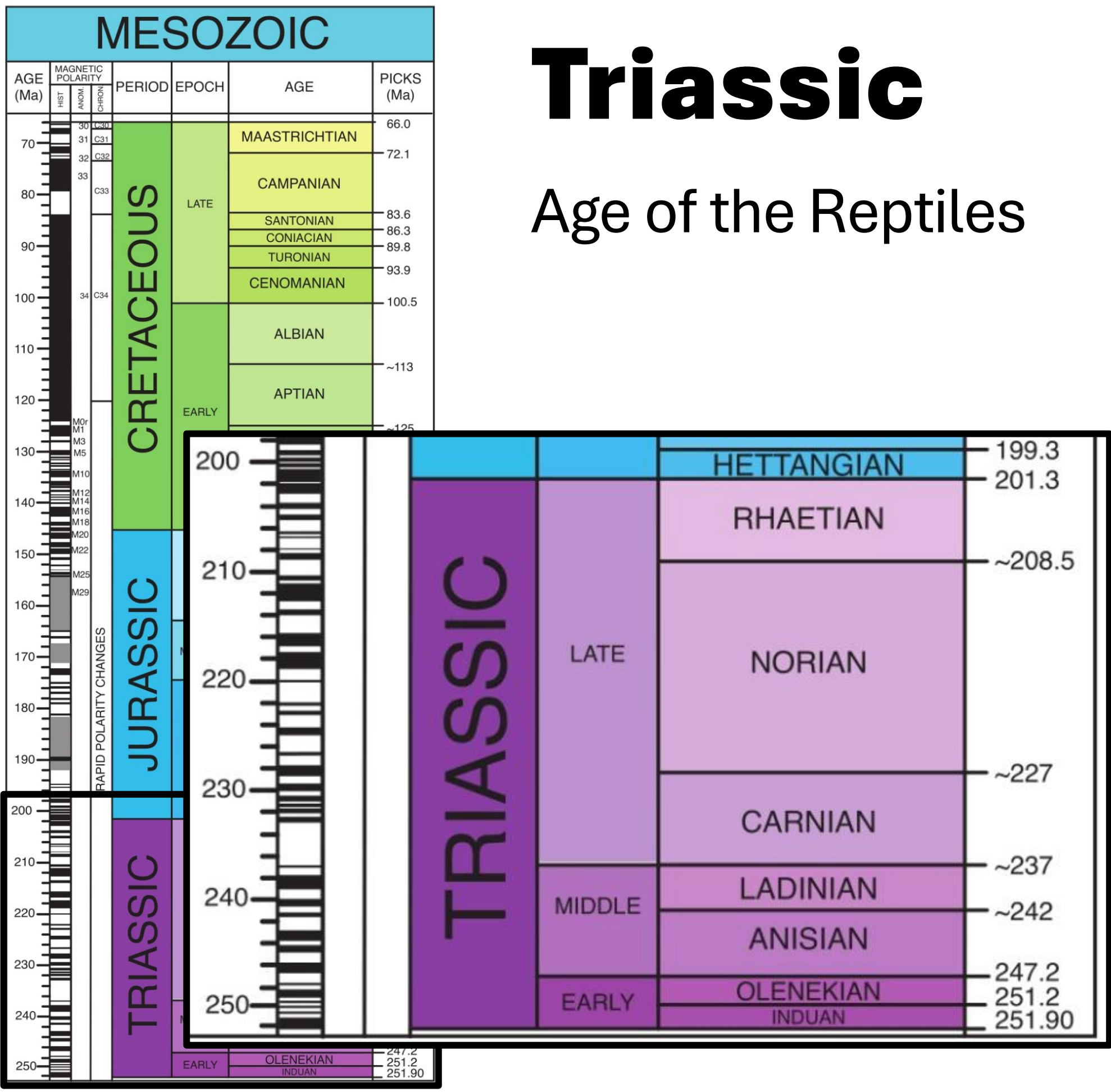
Triassic

Age of the Reptiles

Tuatara

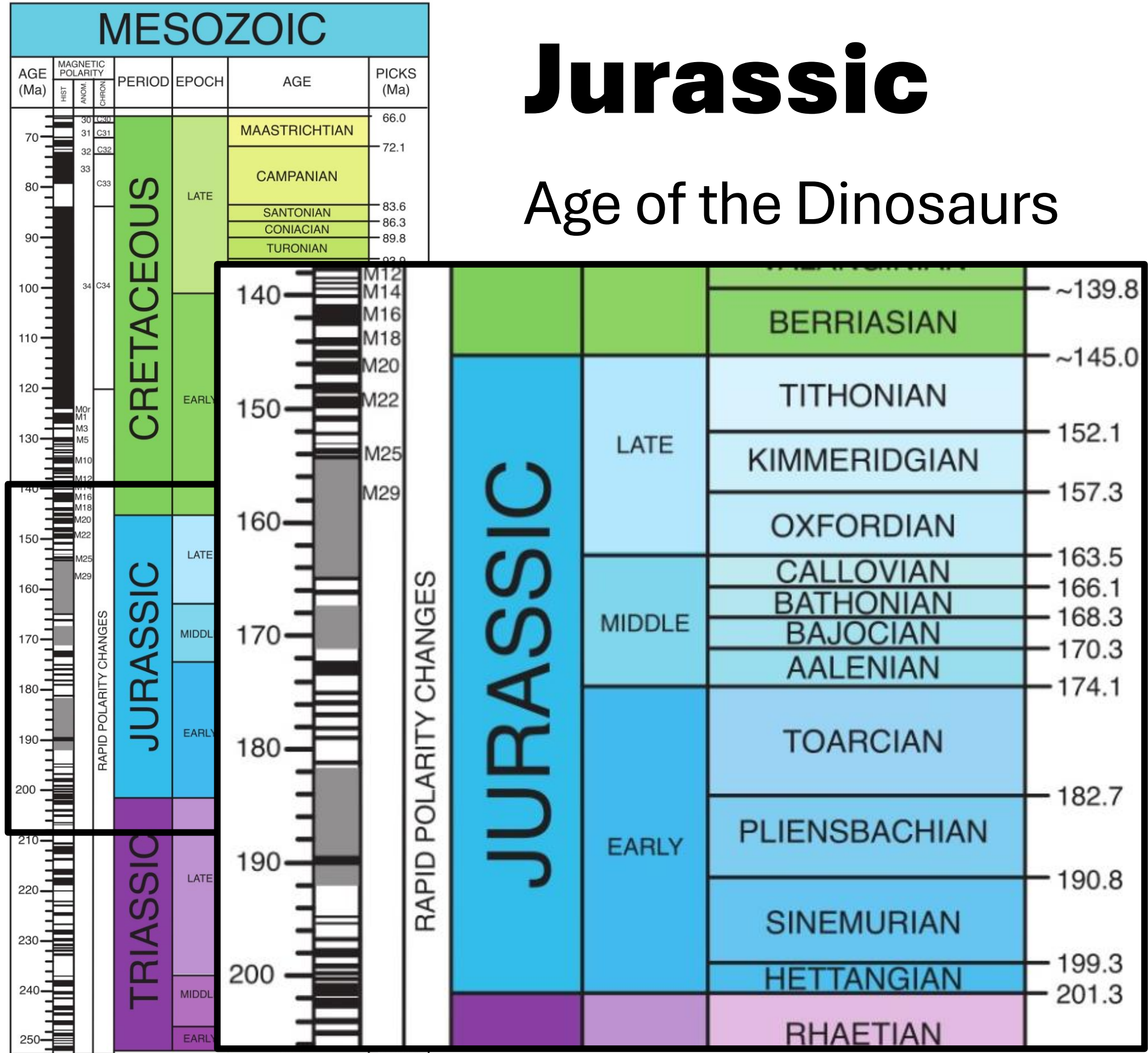
New Zealand

Oldest living reptile species (200 Ma)



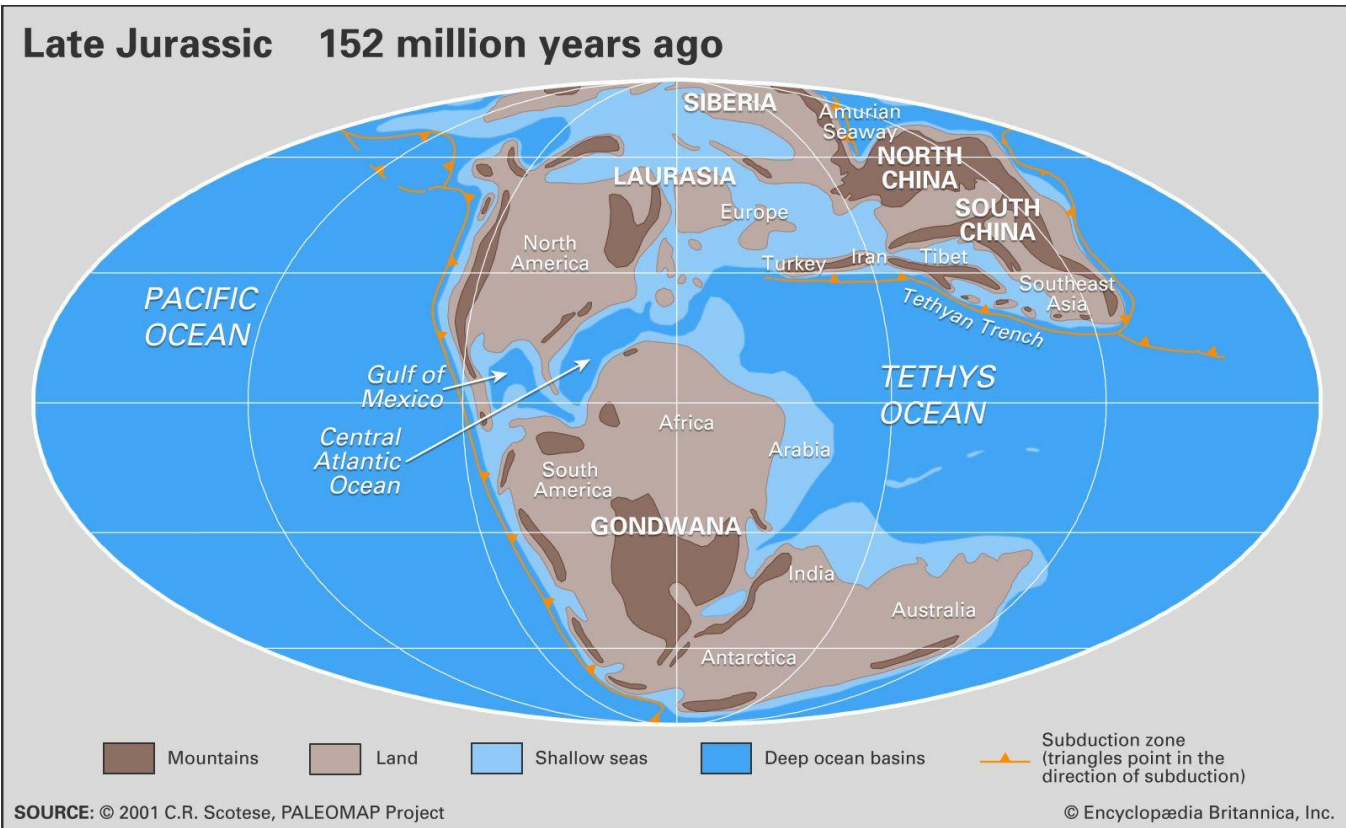
Jurassic

Age of the Dinosaurs



Jurassic continents

Similar to present day



Cretaceous

First Flowering Plants

Archaeofructus

The oldest flowering plant (extinct)

