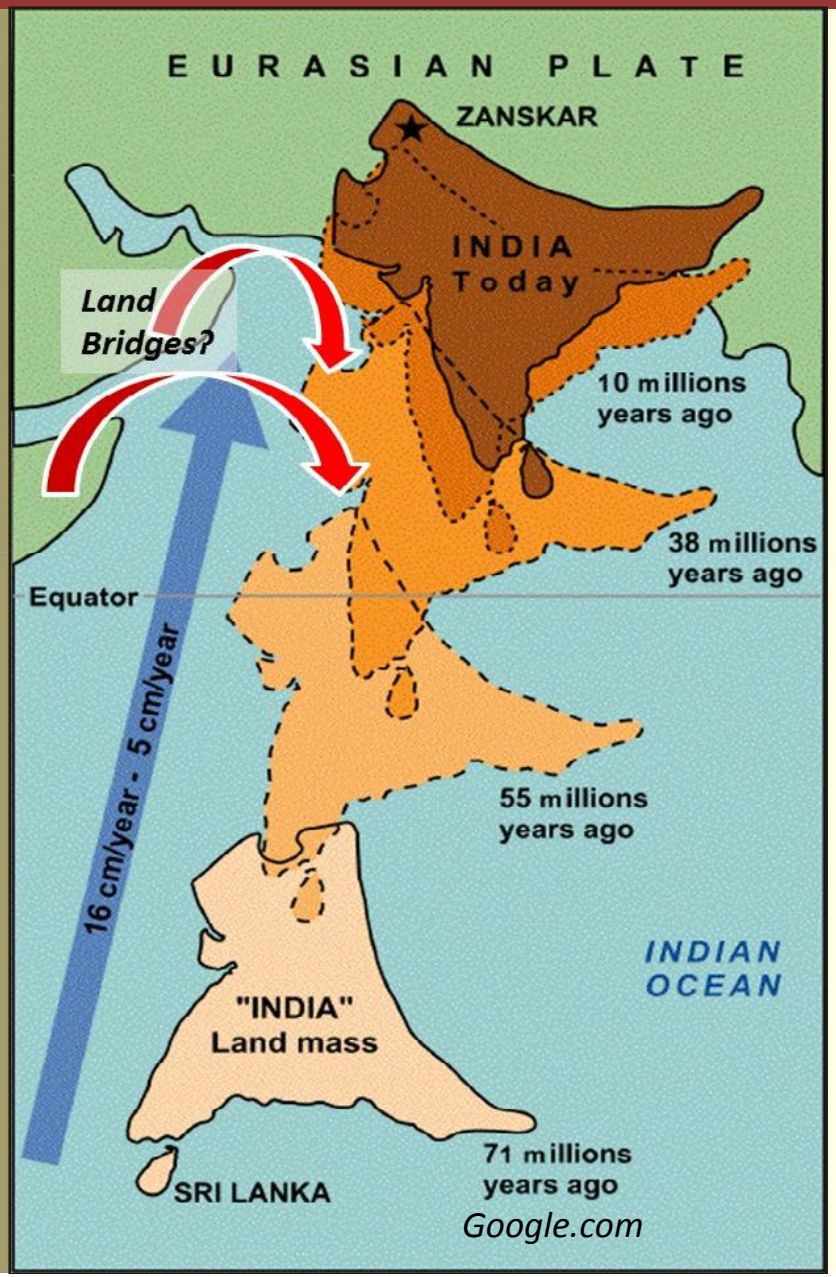
# Tectonic journey of Indian Plate through time

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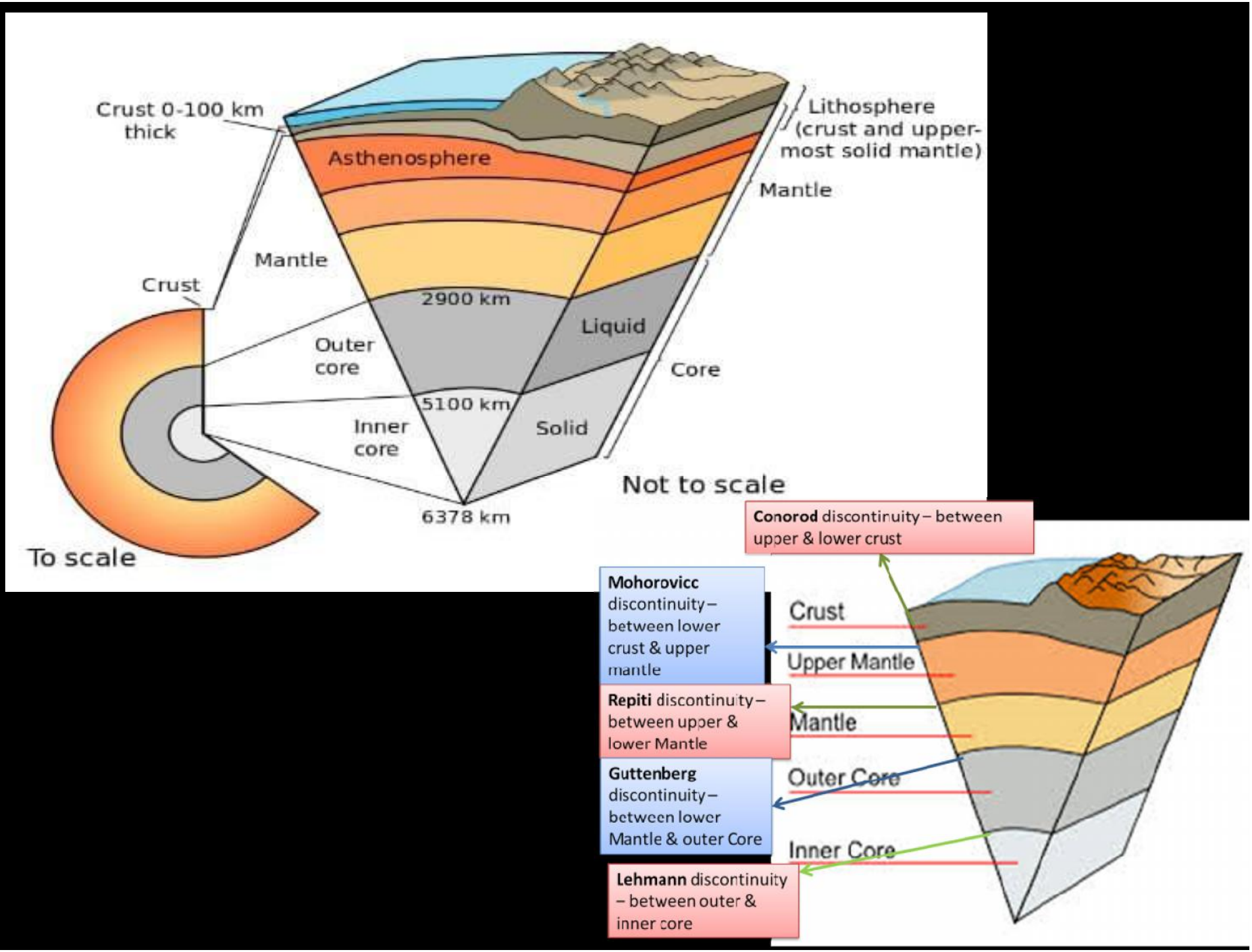
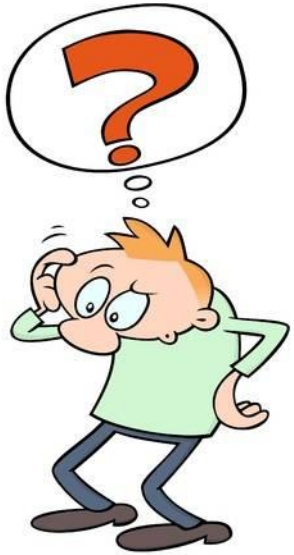
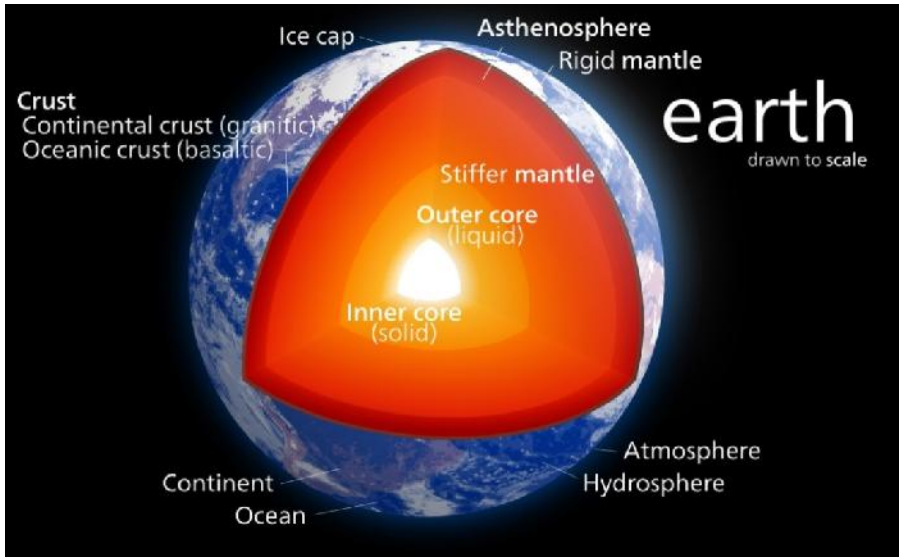
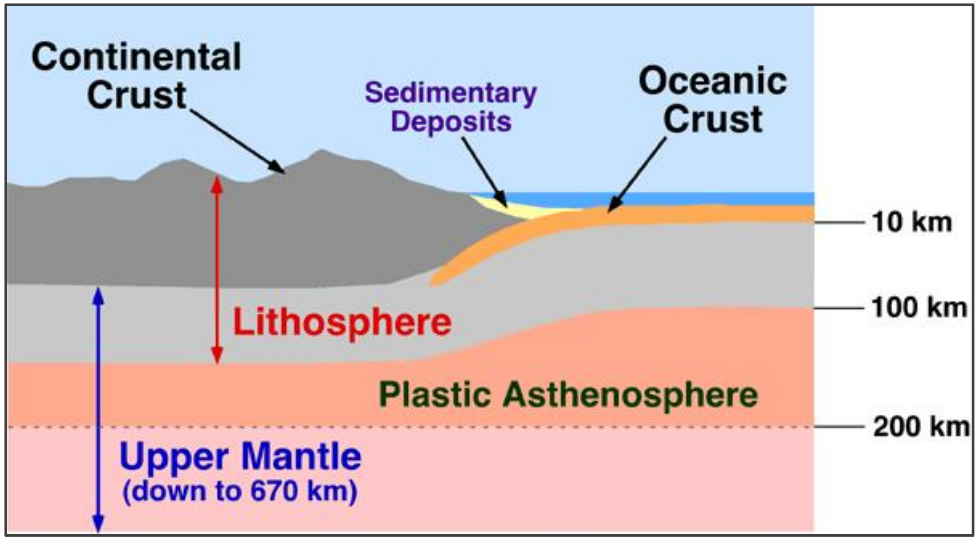

Crust 0-100 km thick
Asthenosphere
Lithosphere (crust and upper-most solid mantle)
Mantle
Mantle
Crust
2900 km
Liquid
Outer core
Core
5100 km
Inner core
Solid
Not to scale
6378 km
To scale
Conorod discontinuity – between upper & lower crust
Mohorovicc discontinuity – between lower crust & upper mantle
Repiti discontinuity – between upper & lower Mantle
Guttenberg discontinuity – between lower Mantle & outer Core
Lehmann discontinuity – between outer & inner core
Crust
Upper Mantle
Mantle
Outer Core
Inner Core

# CONCEPT OF PLATE

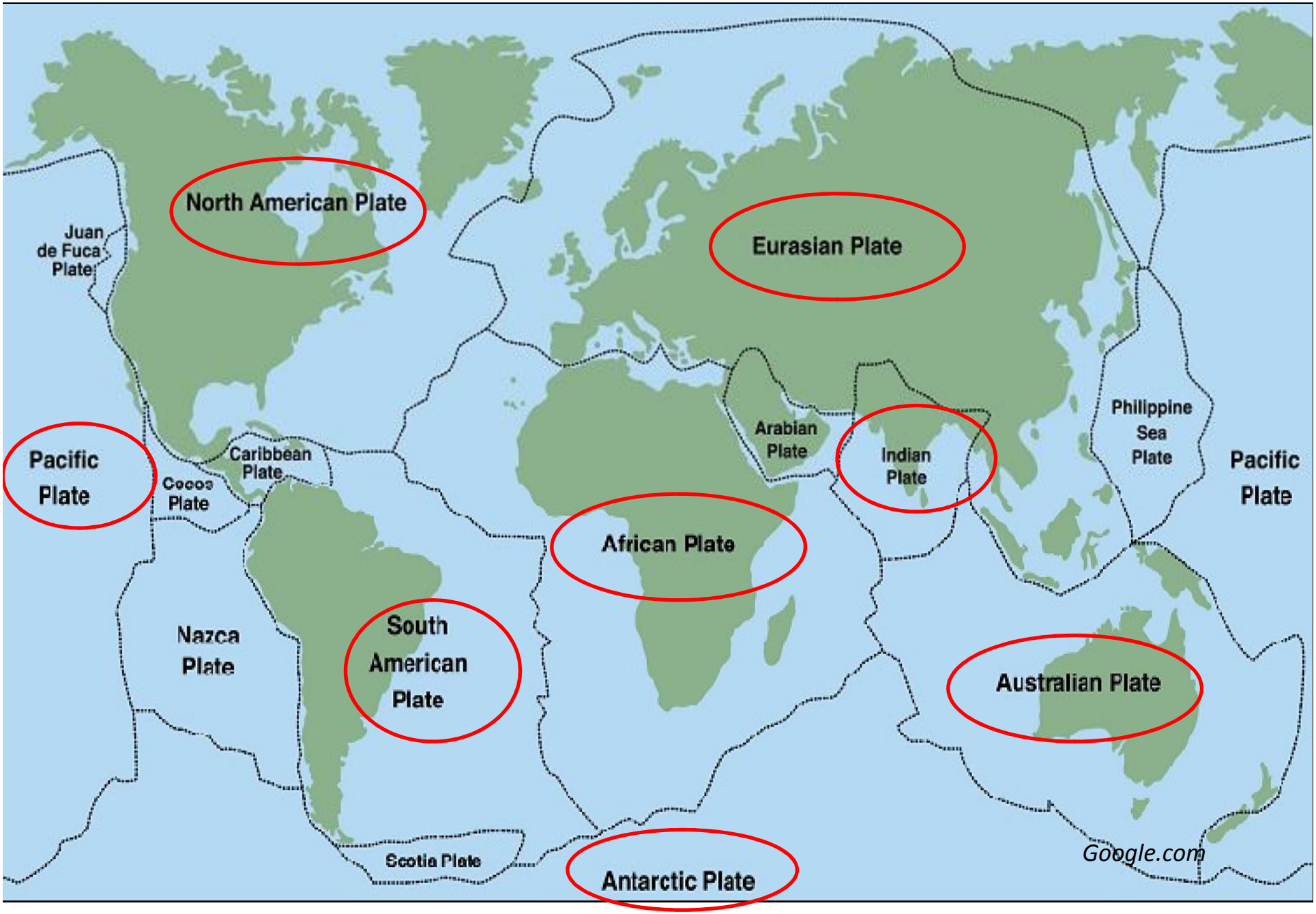



Homophonic confusion!




*Google.com*


North American Plate
Juan de Fuca Plate
Eurasian Plate
Pacific Plate
Caribbean Plate
Cocos Plate
Arabian Plate
Indian Plate
Philippine Sea Plate
Pacific Plate
African Plate
Nazca Plate
South American Plate
Australian Plate
Scotia Plate
Antarctic Plate
Google.com

# CONCEPT OF CONTINENTAL DRIFT

- ***Alfred Wegener***, a German geophysicist and meteorologist, proposed the hypothesis of ***"Continental Drift"*** to the German Geological Society on 6th January, 1912.

- **Continental Drift** –a hypothesis which proposed that the continents had all been joined together to form one "supercontinent", the supercontinent broke into pieces and drifted apart forming the modern continents.

Alfred Wegener

**PLATE TECTONICS**

***Lets see a few snapshots of continental drift taken from Geological Time Machine!!***

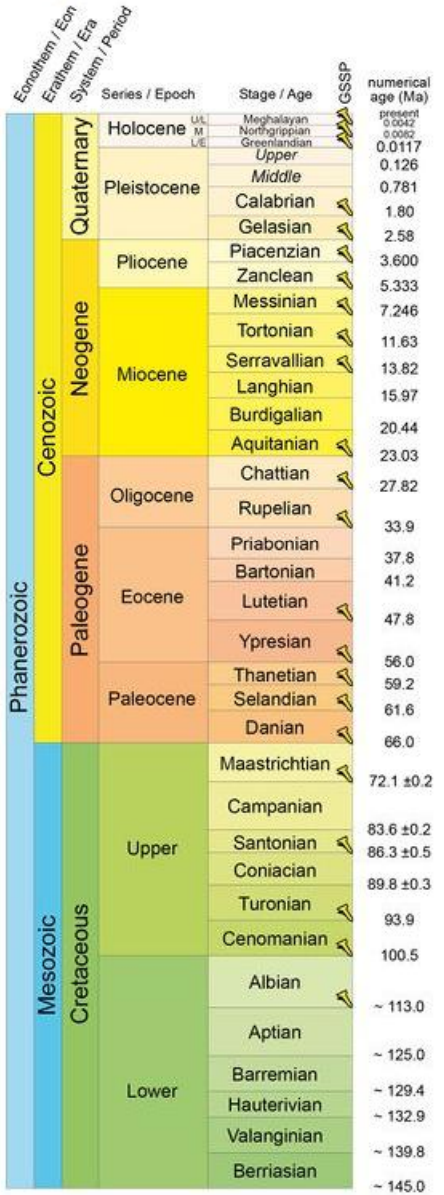
# INTERNATIONAL CHRONOSTRATIGRAPHIC CHART

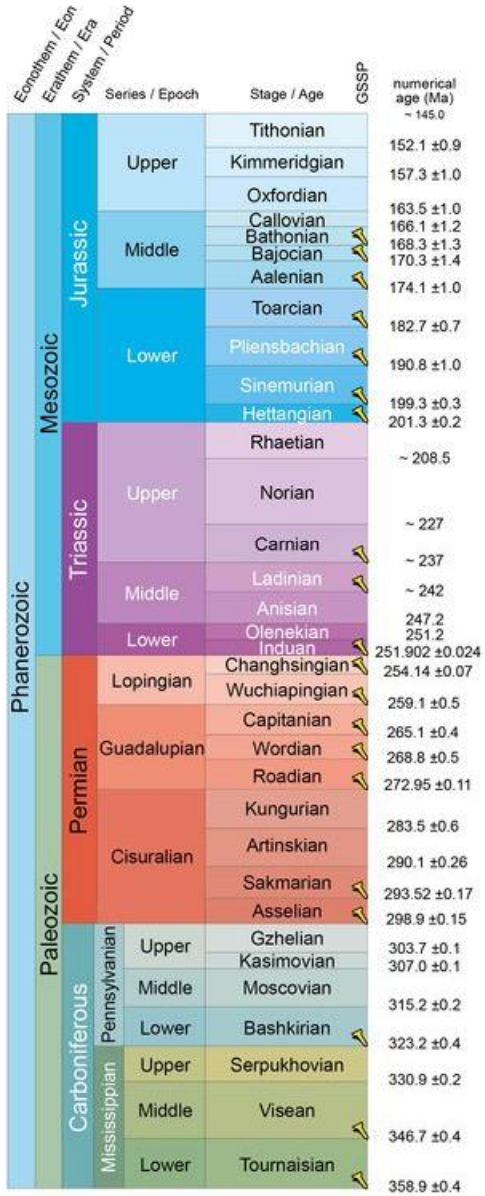
IUGS

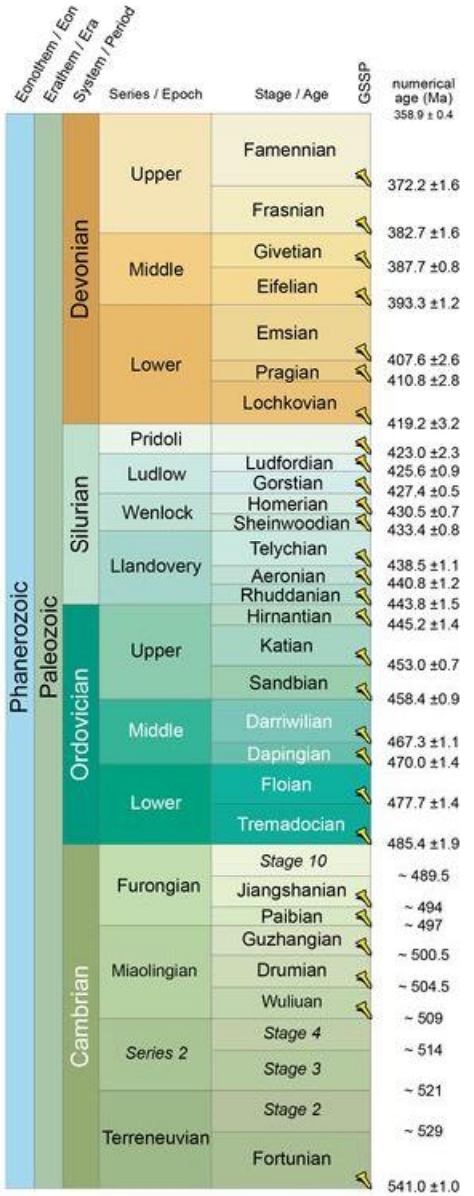
www.stratigraphy.org

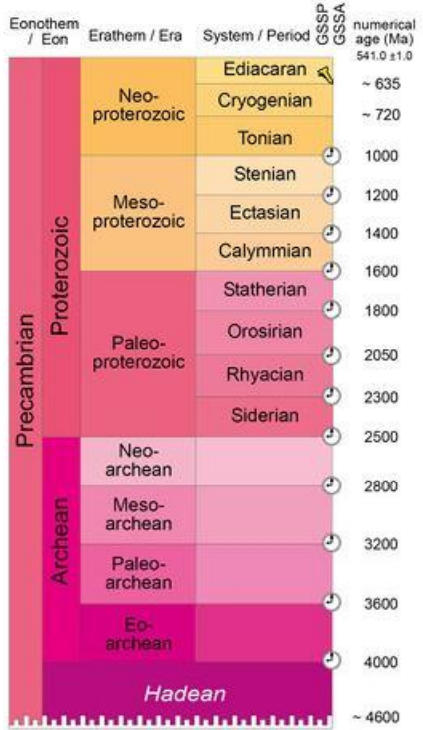
International Commission on Stratigraphy

v 2018/08




Units of all ranks are in the process of being defined by Global Boundary Stratotype Section and Points (GSSP) for their lower boundaries, including those of the Archean and Proterozoic, long defined by Global Standard Stratigraphic Ages (GSSA). Charts and detailed information on ratified GSSPs are available at the website http://www.stratigraphy.org. The URL to this chart is found below.

Numerical ages are subject to revision and do not define units in the Phanerozoic and the Ediacaran; only GSSPs do. For boundaries in the Phanerozoic without ratified GSSPs or without constrained numerical ages, an approximate numerical age (~) is provided.

Ratified Subseries/Subepochs are abbreviated as U/L (Upper/Late), M (Middle) and L/E (Lower/Early). Numerical ages for all systems except Quaternary, upper Paleogene, Cretaceous, Triassic, Permian and Precambrian are taken from 'A Geologic Time Scale 2012' by Gradstein et al. (2012), those for the Quaternary, upper Paleogene, Cretaceous, Triassic, Permian and Precambrian were provided by the relevant ICS subcommissions.

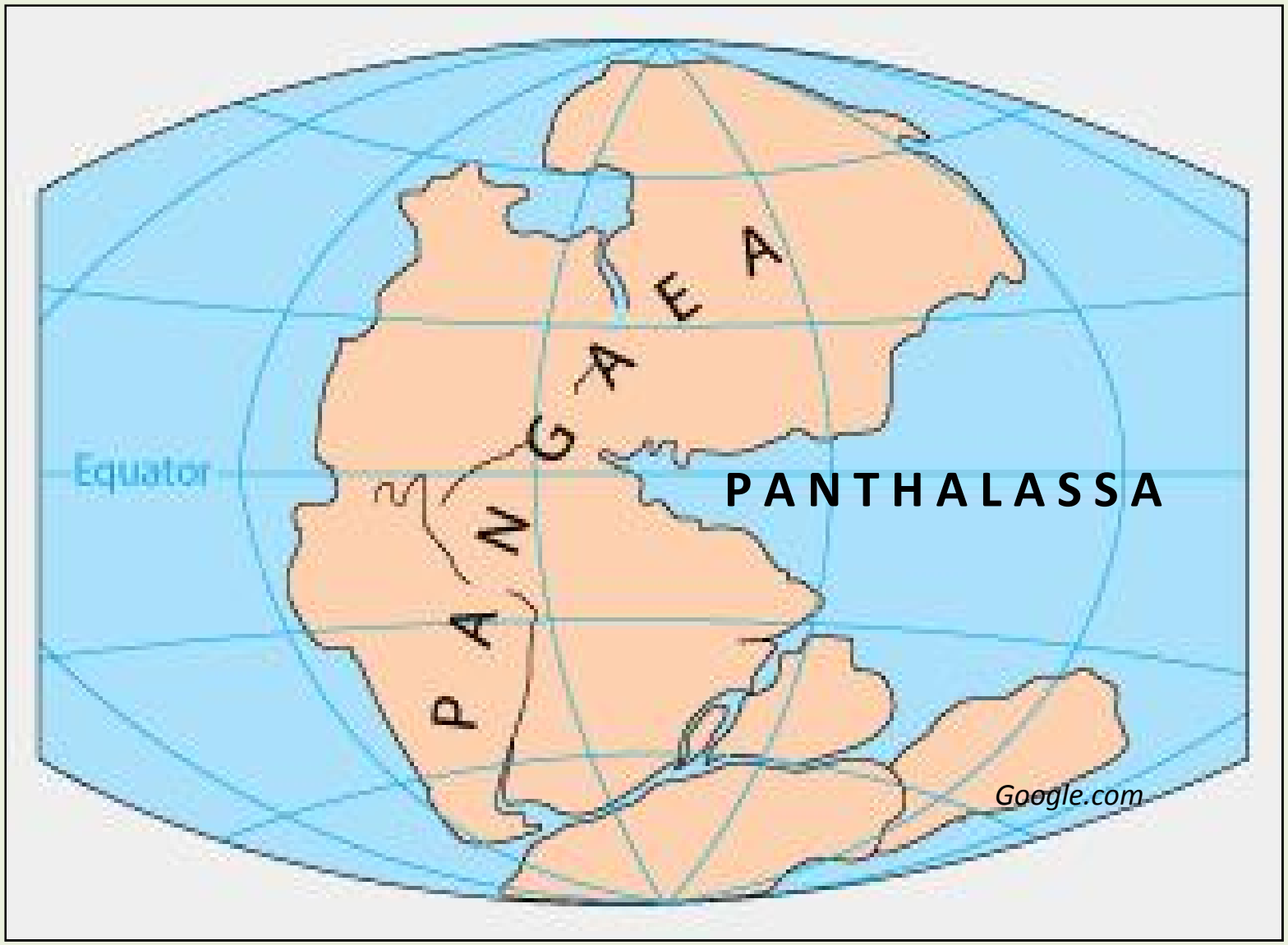
Colouring follows the Commission for the Geological Map of the World (http://www.ccgm.org)

Chart drafted by K.M. Cohen, D.A.T. Harper, P.L. Gibbard, J.-X. Fan

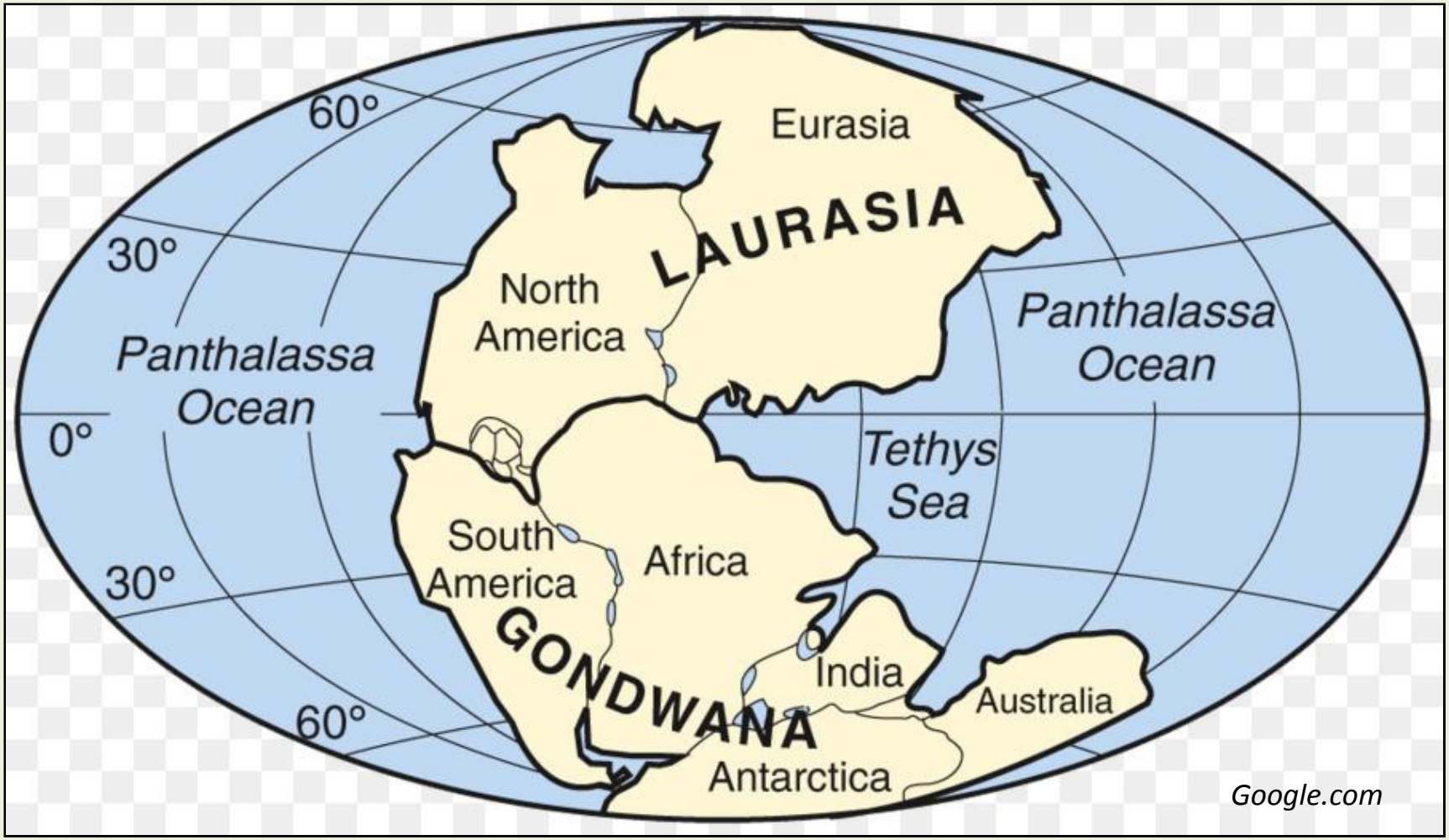

To cite: Cohen, K.M., Finney, S.C., Gibbard, P.L. & Fan, J.-X. (2013; updated) The ICS International Chronostratigraphic Chart. Episodes 36: 199-204.

URL: http://www.stratigraphy.org/ICSchart/ChronostratChart2018-08.pdf

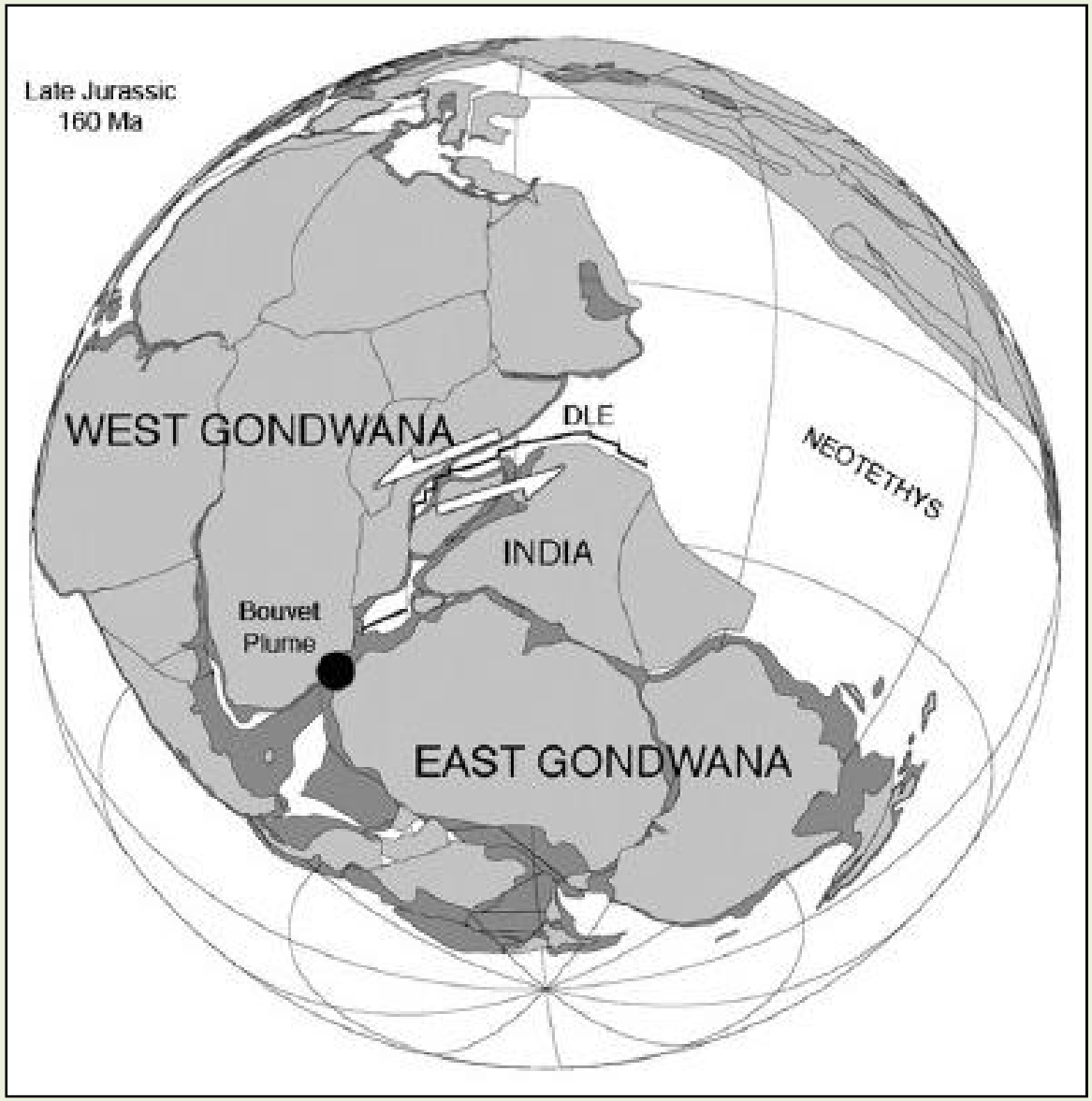
**About 300 million years** ago, Earth didn't have seven continents, but instead one massive supercontinent called ***PANGAEA***, which was surrounded by a single ocean called ***PANTHALASSA***.



By **Late Triassic time (~235 Ma)** Pangaea began to break apart into ***LAURASIA*** and ***GONDWANA***



Separation of ***EAST GONDWANA*** from ***WEST GONDWANA*** during **Late Jurassic time (~160Ma)**

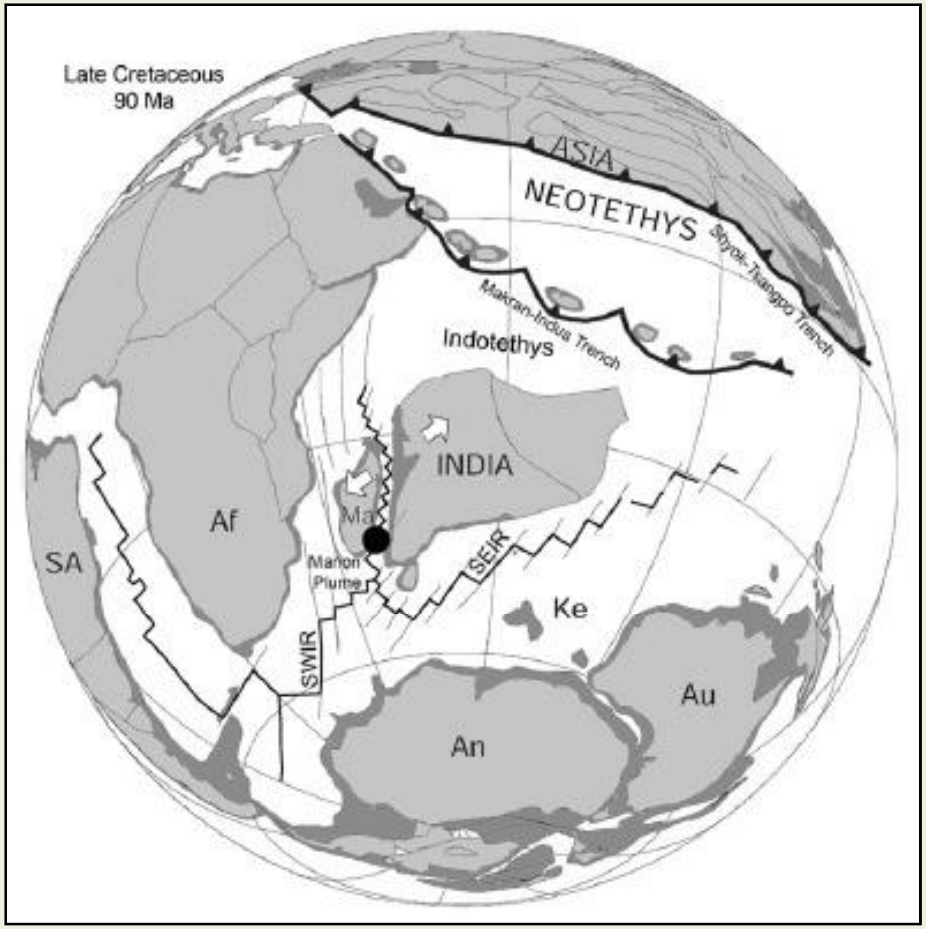


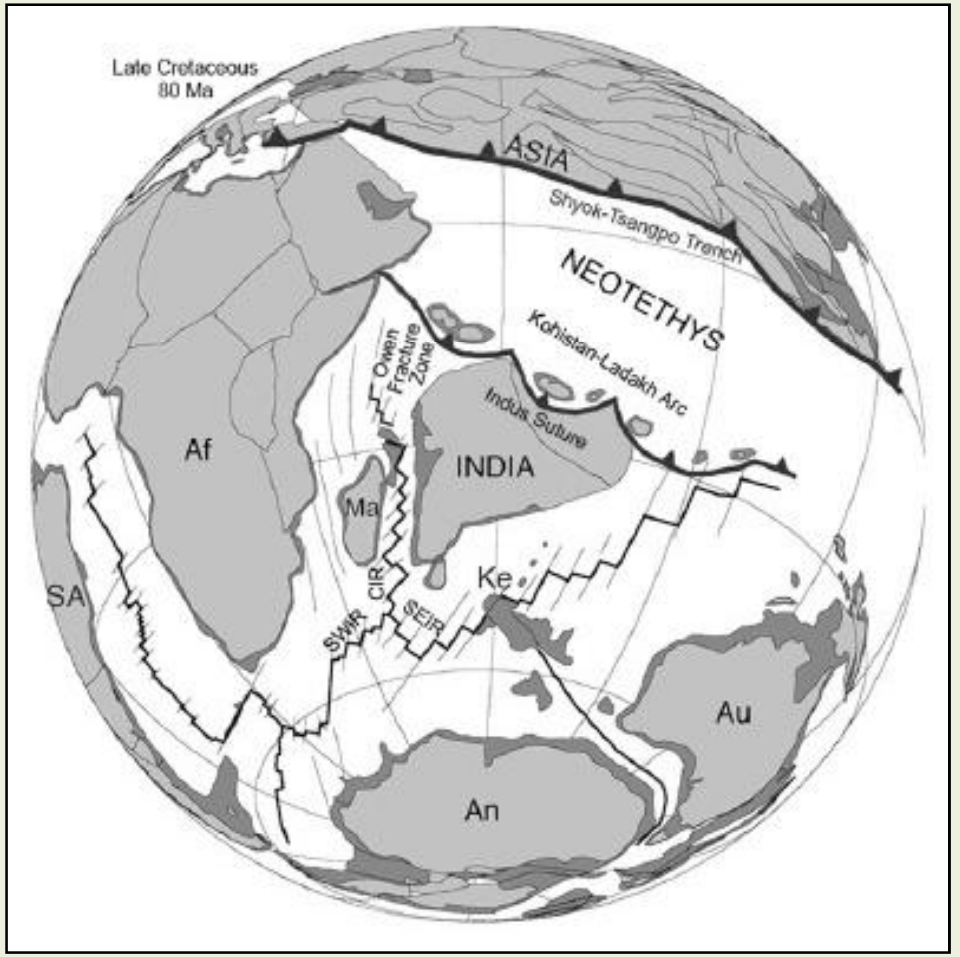

**Chatterjee et al. (2013)**

Separation of ***INDIA*** from ***ANTARCTICA–AUSTRALIA*** during the **Early Cretaceous (120Ma)**


**Chatterjee et al. (2013)**

Separation of ***INDIA*** from ***MADAGASCAR*** during the **Late Cretaceous (~90Ma)**

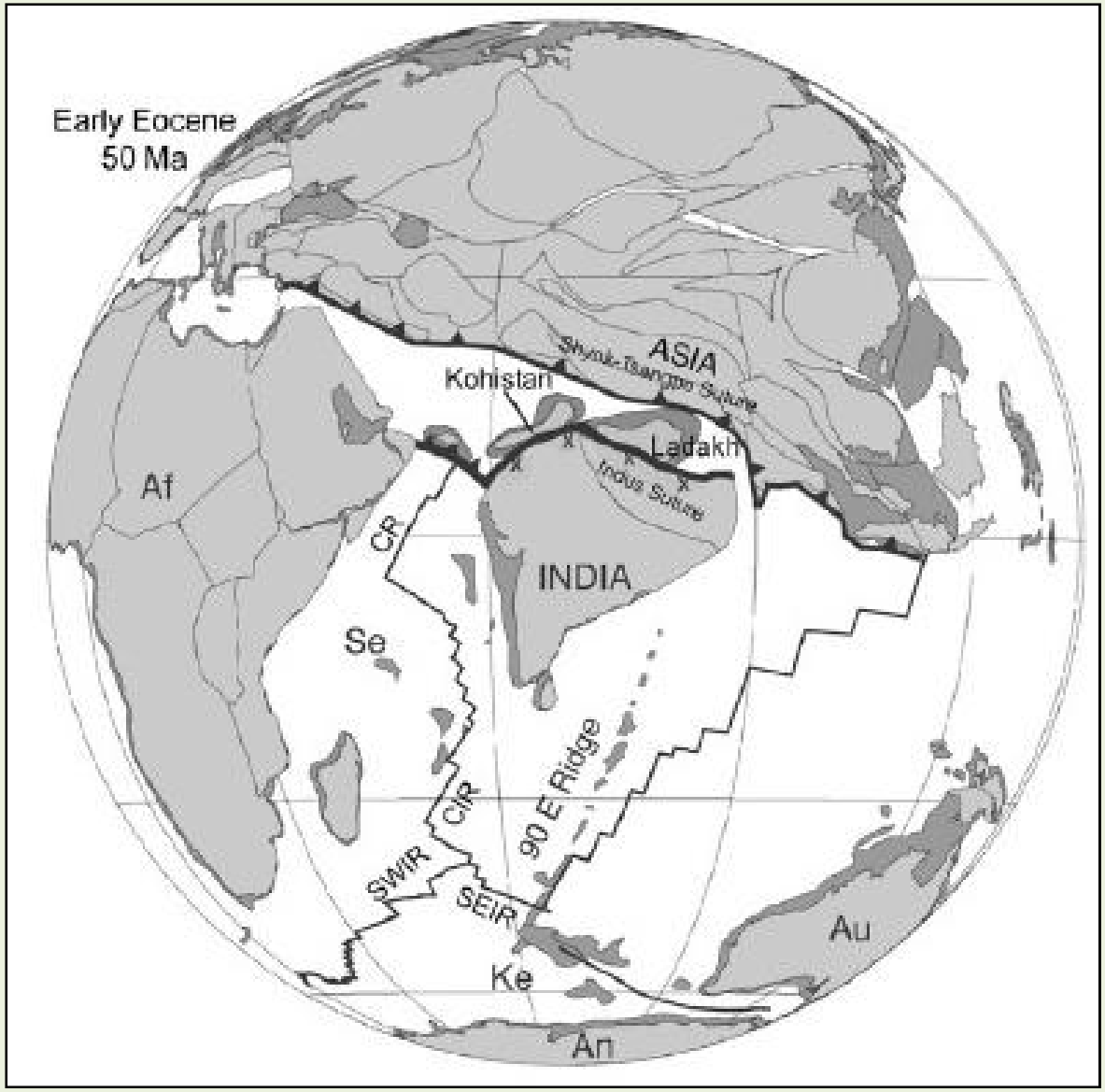



Collision of the ***Indian plate*** with the ***Kohistan–Ladakh island arc*** during the Late Cretaceous time along the Indus Trench **(~80 Ma)**

**Chatterjee et al. (2013)**

***INDIA–ASIA COLLISION*** with the closure of the Neotethys during **Early Eocene (~50 Ma)**




**Chatterjee et al. (2013)**

# CONTINENTS AND OCEANS AT PRESENT DAY


*Google.com*

Package

# TECTONIC JOURNEY OF INDIAN PLATE

One of the most complex and remarkable journeys of all the continents .

**~ 9000 KM IN 160 MILLION YEARS!!**

***Indian Plate velocity:***

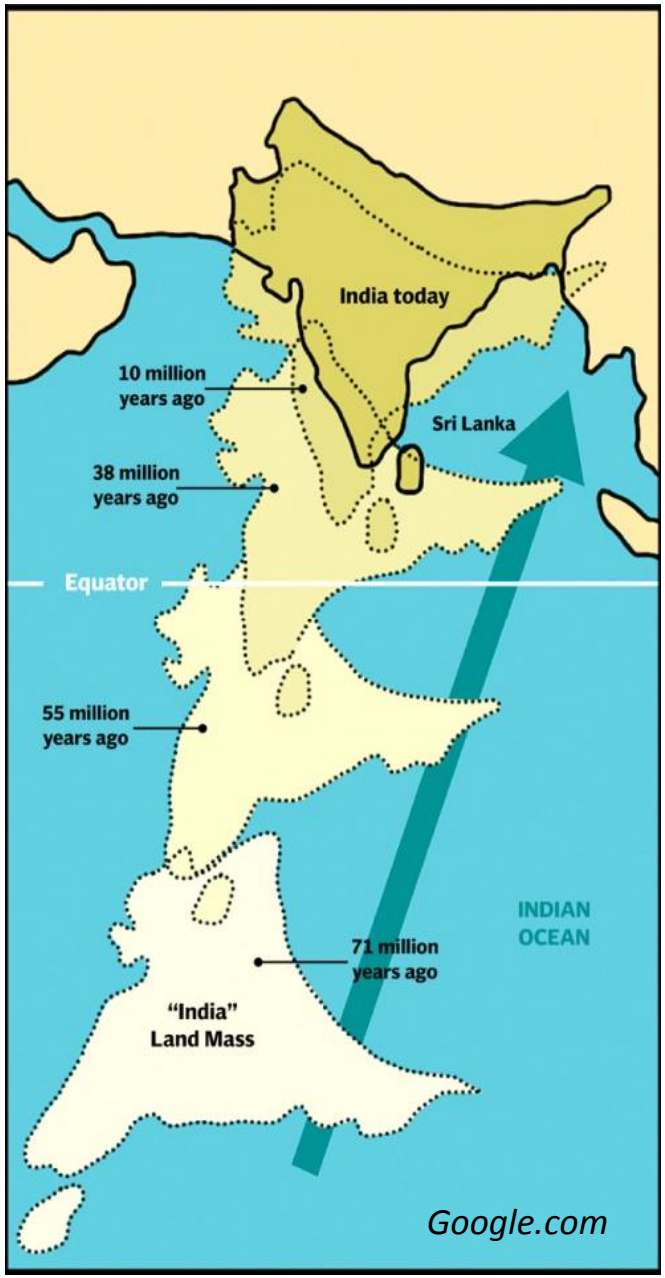
- Starting northward at a rate of **3–5 cm/year (Mesozoic)**

- Sudden acceleration of 20 cm/year (from Late **Cretaceous** (~67 Ma) at the KT boundary):
  **MAXIMUM!**

- Slowed down considerably at **5 cm/year** (Early **Eocene ,~50 Ma**) during its convergence with Asia and the closure of the Neotethys .

https://youtu.be/uLahVJNnoZ4

https://youtu.be/UvIDxu7twpc



**THE INDIAN PLATE IS STILL ACTIVE TODAY AND DRIFTS AT A VELOCITY OF ABOUT 5 CM/ YEAR!**


Thank you!