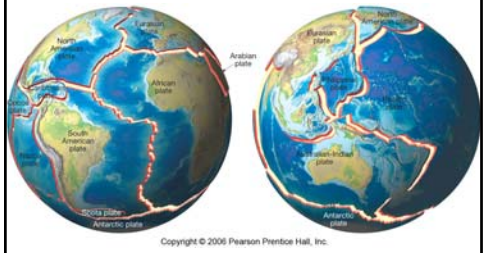
Plate Boundaries

- Time To See Your Advisor

Lithospheric Plates



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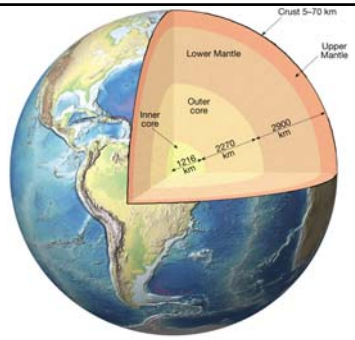
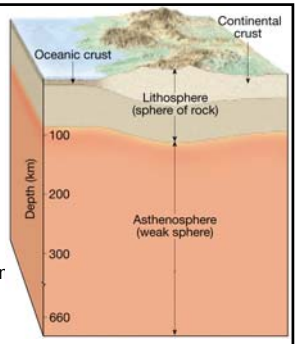
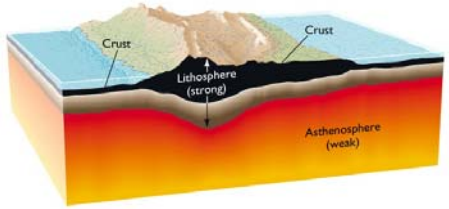


- Oceanic
  - Basalt
  - silica, + iron, magnesium
  - Higher density
- Continental
  - Granite
  - More silica, + calcium, sodiur
  - Lower density

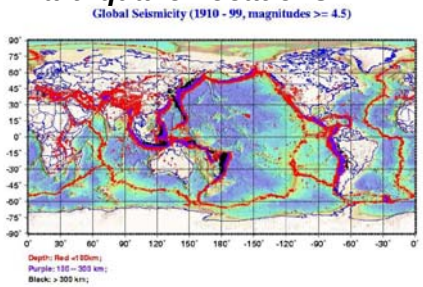


Relationship of crust, lithosphere and asthenosphere

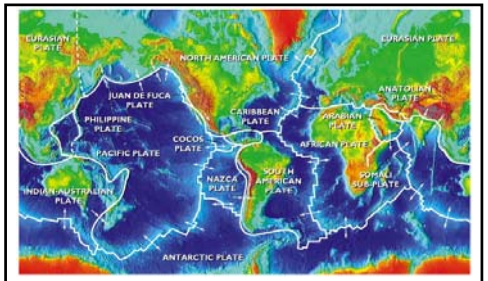


- http://earth.geol.ksu.edu/sgao/g100/plots/0829_12_litho.jpg

Earthquake Locations



- http://earth.geol.ksu.edu/sgao/g100/plots/0916_global_seismicity.jpg

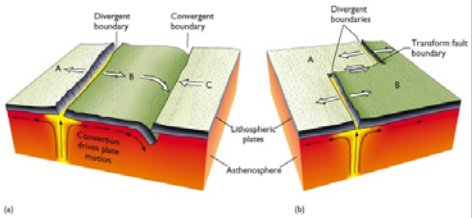


- Know the names of the 7 major plates, and be able to identify them on a map
- http://earth.geol.ksu.edu/sgao/g100/plots/0829_08_plates.jpg

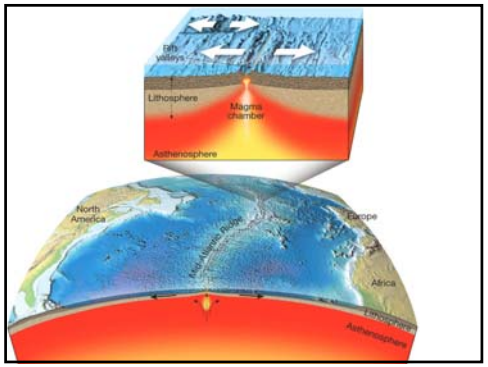
Boundaries of plates

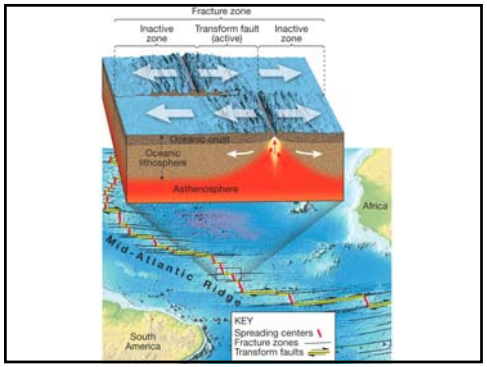
- Divergent
  - Constructive
  - Ridge
- Convergent
  - Destructive
  - Trench
- Transform
  - Not either

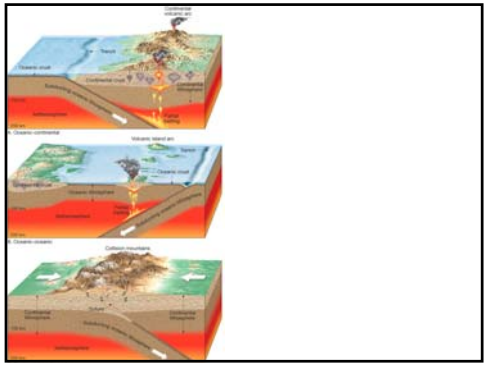
Three types of plate boundaries

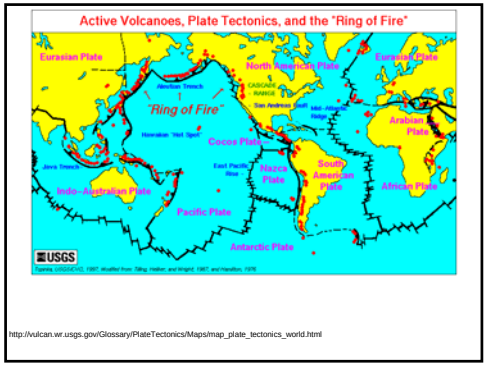


- http://earth.geol.ksu.edu/sgao/g100/plots/0829_3boundaries.jpg

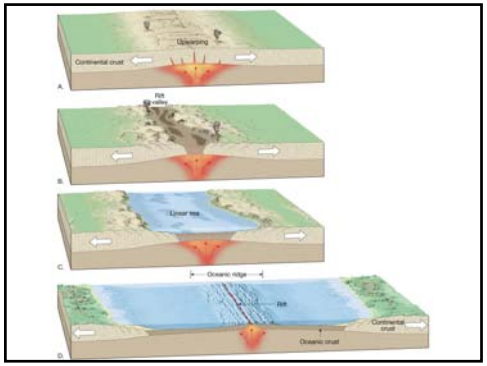








http://vulcan.wr.usgs.gov/Glossary/PlateTectonics/Maps/map_plate_tectonics_world.html

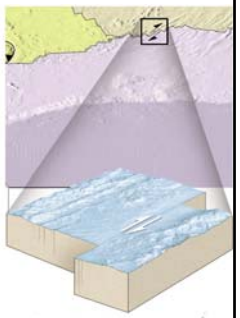


Diverging Plates

Icelandic Rift

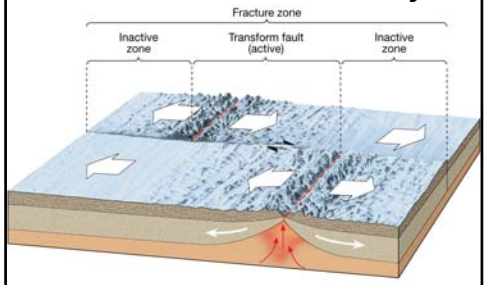
http://earth.geol.ksu.edu/sgao/g100/plots/0829_09_iceland.jpg

Transform Boundary

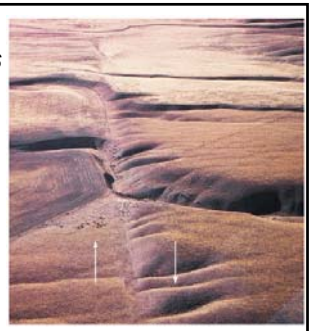


C. Transform fault boundary

Transform Fault Boundary

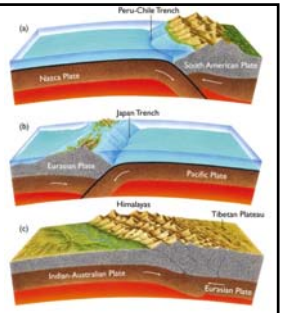


San Andreas Transform Fault

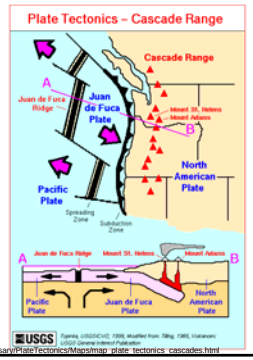


- http://earth.geol.ksu.edu/sgao/g100/plots/0829_11_saf_photo.jpg

Three types of convergent margins

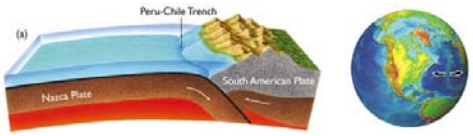


- http://earth.geol.ksu.edu/sgao/g100/plots/0829_10_convergent.jpg



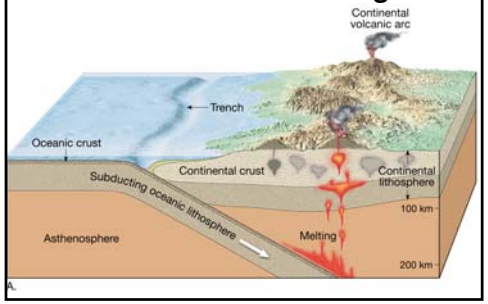
http://vulcan.wr.usgs.gov/Glossary/PlateTectonics/Maps/map_plate_tectonics_cascades.html

Peru-Chile Trench

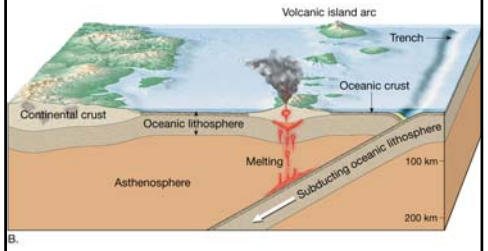


- http://earth.geol.ksu.edu/sgao/g100/plots/0829_10_convergent.jpg

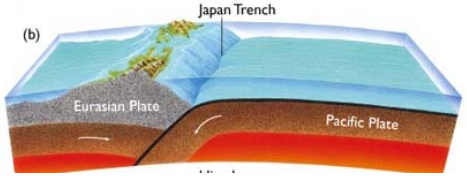
Ocean-Continent Convergence



Ocean-Ocean Convergence



Japan Trench



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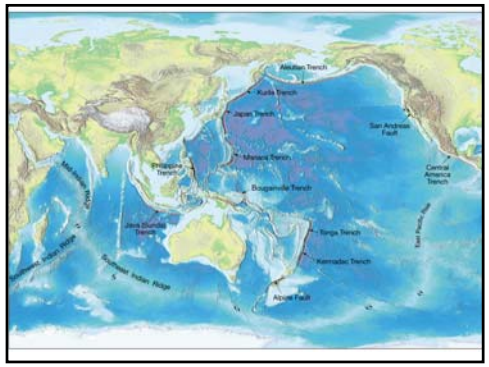
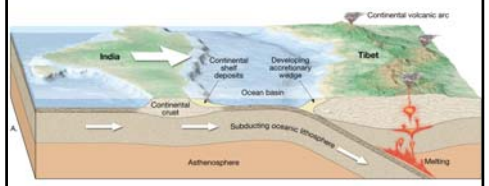
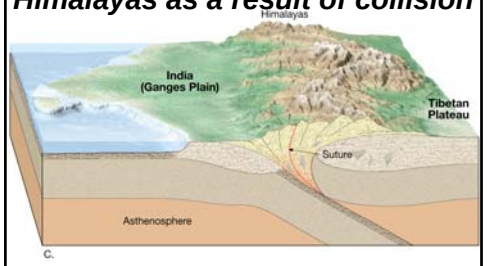


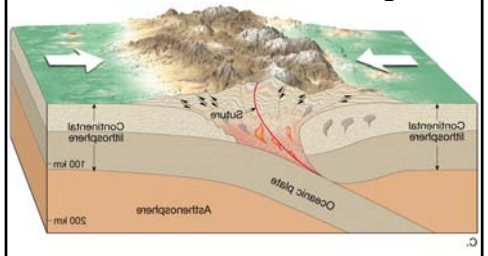
India-Asia before collision



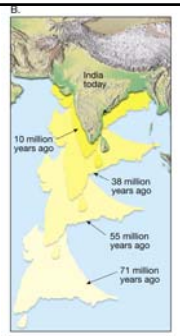
Himalayas as a result of collision



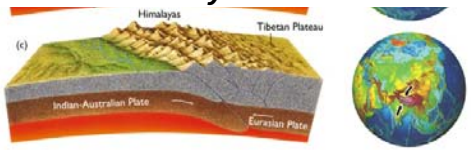
Continent-Continent Convergence



Indian Plate Movement

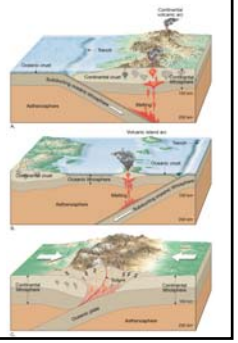


Himalayan Suture

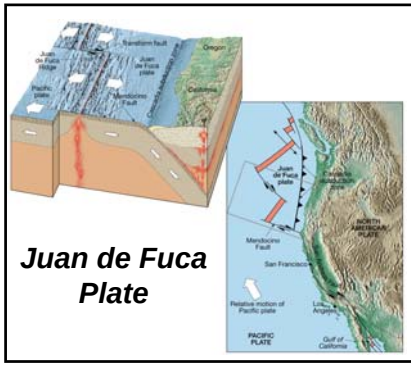


- http://earth.geol.ksu.edu/sgao/g100/plots/0829_10_convergent.jpg

Summary of convergent plates

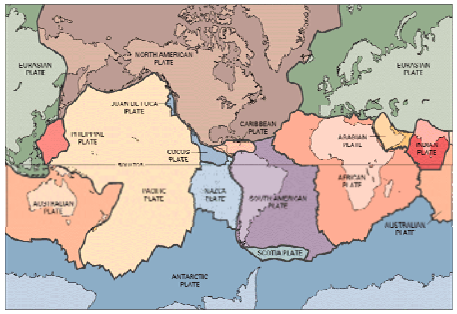


Juan de Fuca Plate



Juan de Fuca Plate

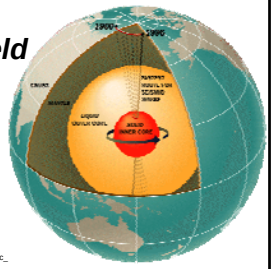
http://vulcan.wr.usgs.gov/Glossary/PlateTectonics/Maps/map_juan_de_fuca_ridge.html



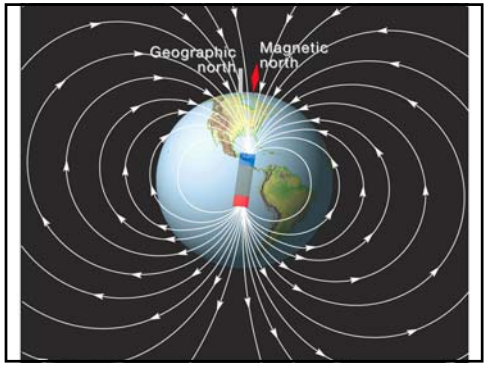
Animation link http://www.ucmp.berkeley.edu/geology/tectonics.html

- http://www-personal.umich.edu/~vdpluijm/plates.gif

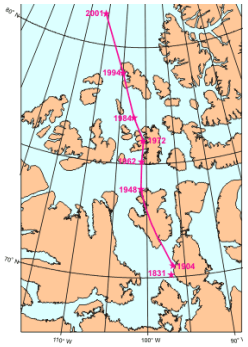
Dynamo that creates magnetic field



- http://www.nasa.gov/vision/earth/lookingatearth/29dec_magneticfield.html

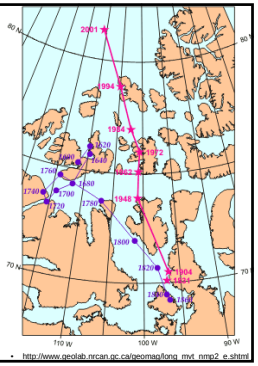


Movement of Magnetic North



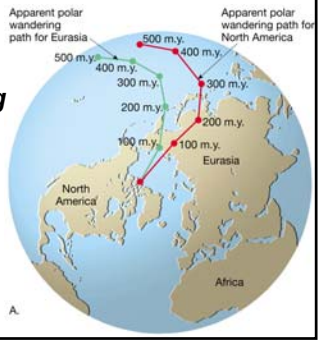
- http://www.nasa.gov/vision/earth/lookingatearth/29dec_magneticfield.html

Movement of Magnetic pole since 1600s

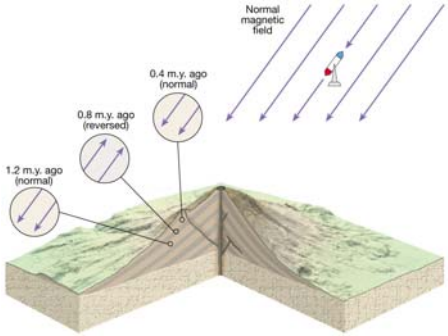


- http://www.geolab.nrcan.gc.ca/geomag/long_mvt_nmp2_e.shtml

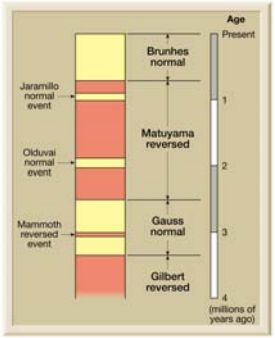
Apparent Polar wandering for North America and Eurasia



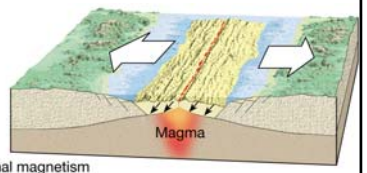
Pole location with moving continents



Magnetic Reversal Age Scale

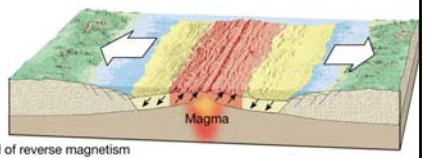


Lava Magnetized in Normal Field



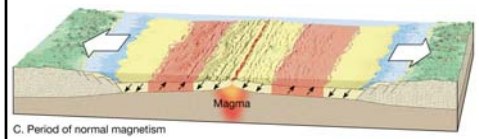
A. Period of normal magnetism

Lava Magnetized in reversed field

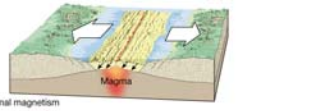


B. Period of reverse magnetism

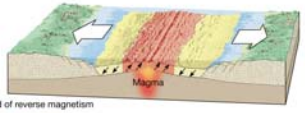
Later Lava Magnetized in Normal Field



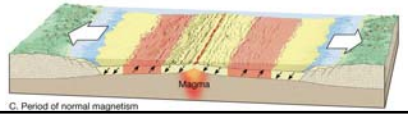
C. Period of normal magnetism



A. Period of normal magnetism

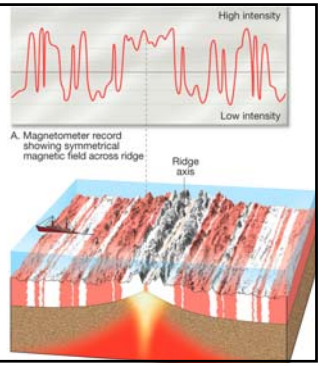


B. Period of reverse magnetism



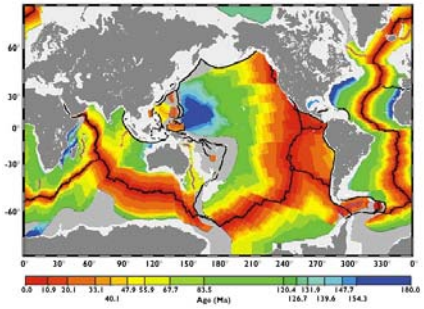
C. Period of normal magnetism

Magne-tometer Survey



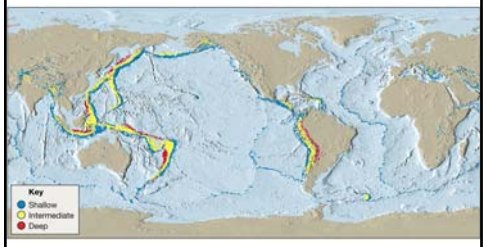
A. Magnetometer record showing symmetrical magnetic field across ridge

Magnetic Anomalies

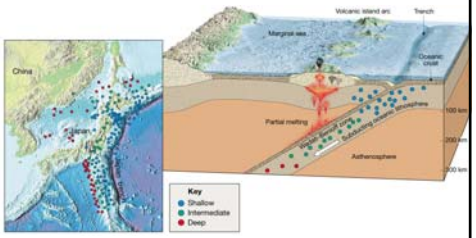


- http://earth.geol.ksu.edu/sgao/g100/plots/0829_04_age_of_ocean_floor.jpg

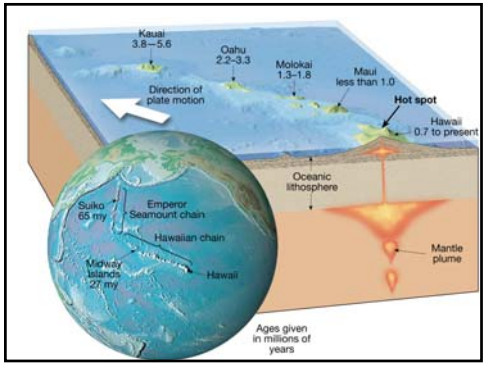
Earthquakes Locations and Depths



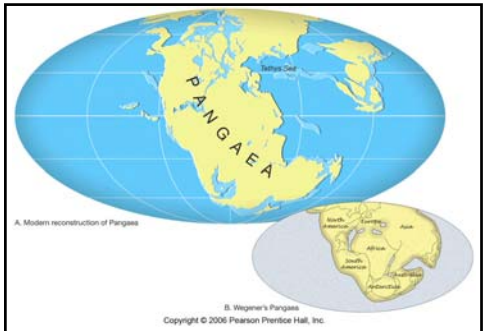
Japan Trench earthquakes



JOIDES Resolution



Velocities of Plates



A. 200 Million Years Ago (Early Jurassic Period)

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B. 150 Million Years Ago (Late Jurassic Period)

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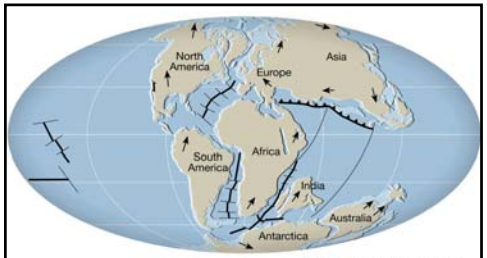

C. 100 Million Years Ago
(Cretaceous Period)

C. 90 Million Years Ago (Cretaceous Period)

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D. 50 Million Years Ago (Early Cenozoic)

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E. 20 Million Years Ago (Late Cenozoic)

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F. Present

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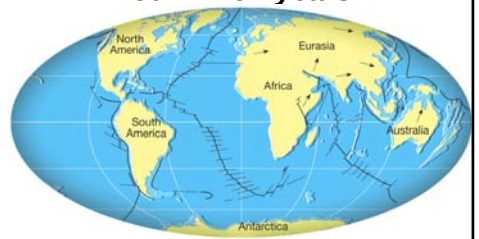
In 50 million years?



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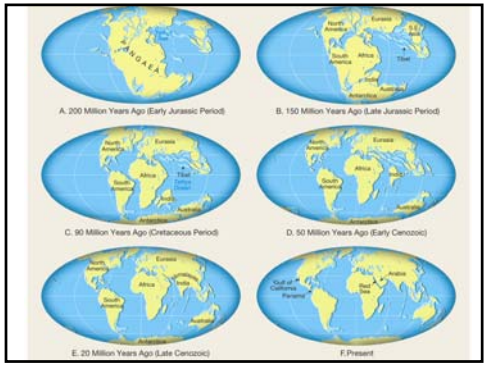
In 250 million years??

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