

Biogeography. Lecture 6

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January 24, 2018



Outline

Basics of physical geography
Basics of climatology

Palaeogeography
Geological time
Plate tectonics



Outline

Basics of physical geography

Basics of climatology

Palaeogeography

Geological time

Plate tectonics

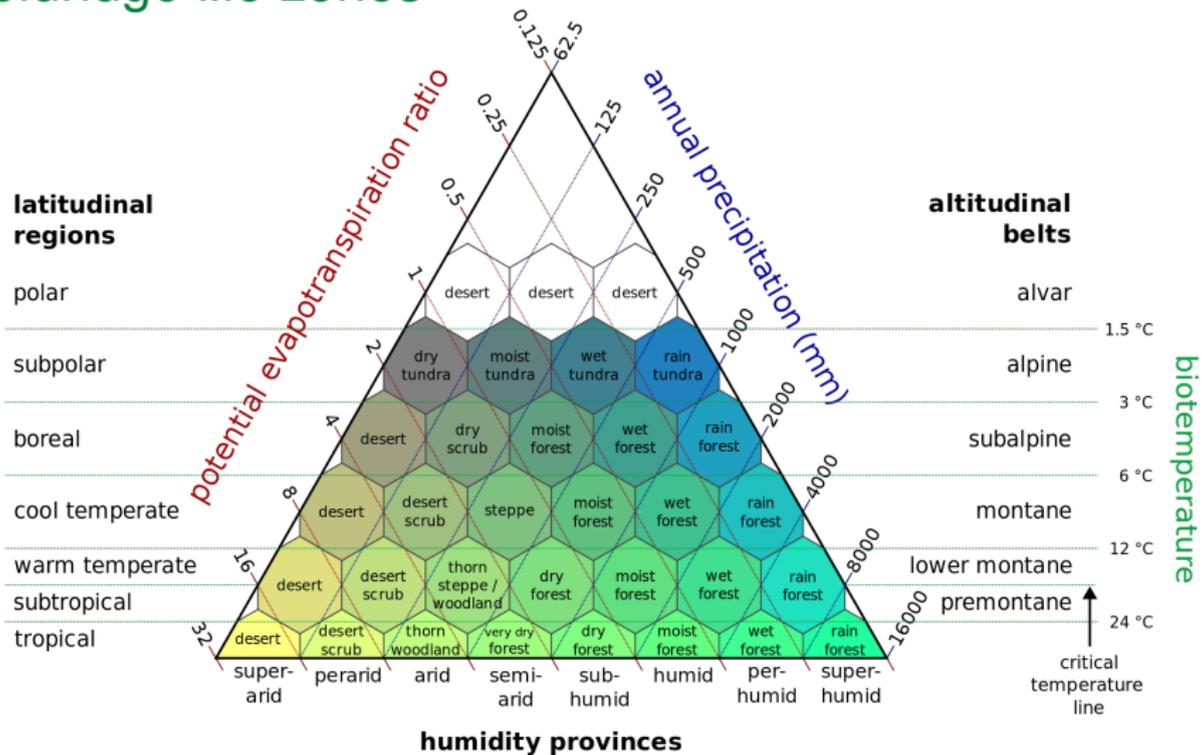


Basics of physical geography

Basics of climatology



Holdridge life zones



3 axes: biotemperature, PET (how much water would be evaporated if available) and precipitation. Intersections of all three give life zones.



Palaeogeography

Geological time



Use of radioactivity

- ▶ In 1896, Becquerel discovered radioactivity. It was found that some atoms are constantly breaking into smaller ones, sometimes with very slow speed
- ▶ Consequently, it is possible can calculate the age of mineral from the concentration of radioactive elements

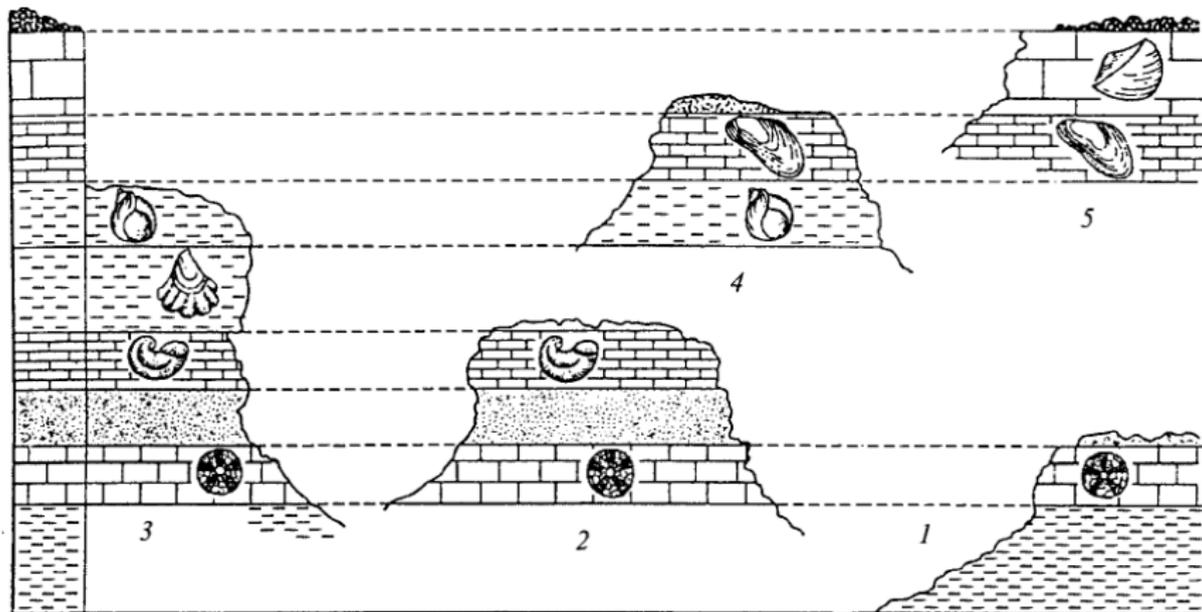


Stratigraphy

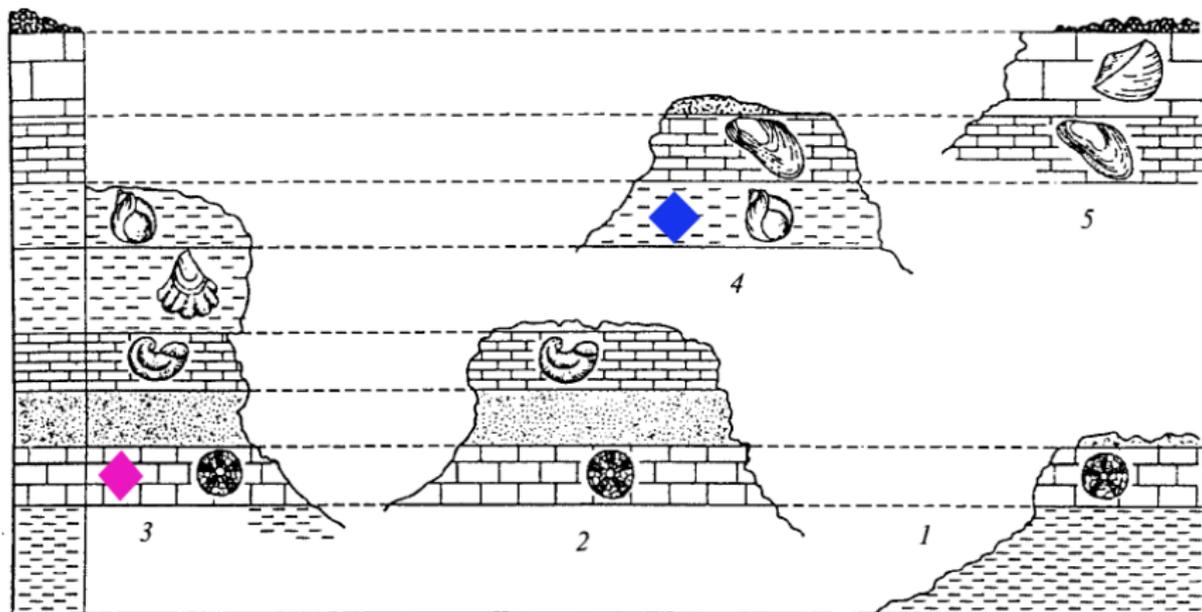
- ▶ Upper layers are younger than lower
- ▶ Two layers contained similar species of fossils have the same time of origin



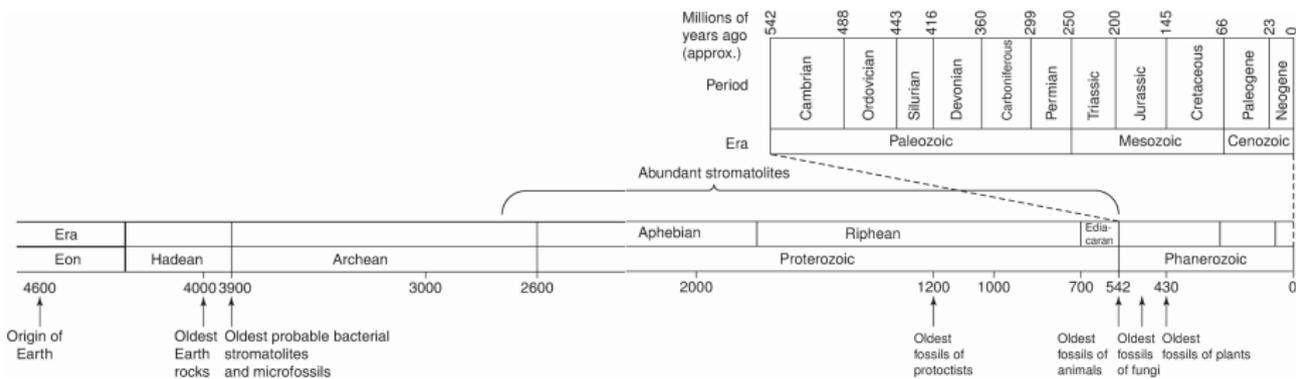
How stratigraphy works



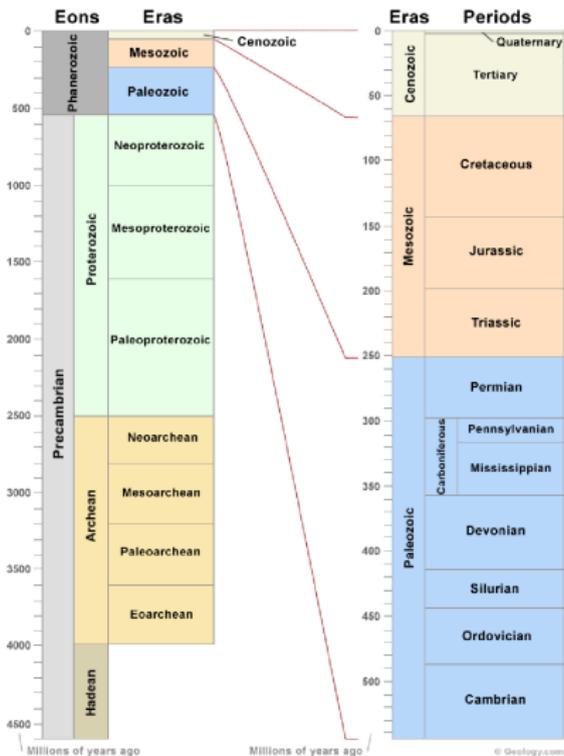
Stratigraphy and radioactivity work together



Geological scale



Geological scale (variant 2)



I want you to memorize eras and Mesozoic/Cenozoic periods.



Palaeogeography

Plate tectonics



Continental drift

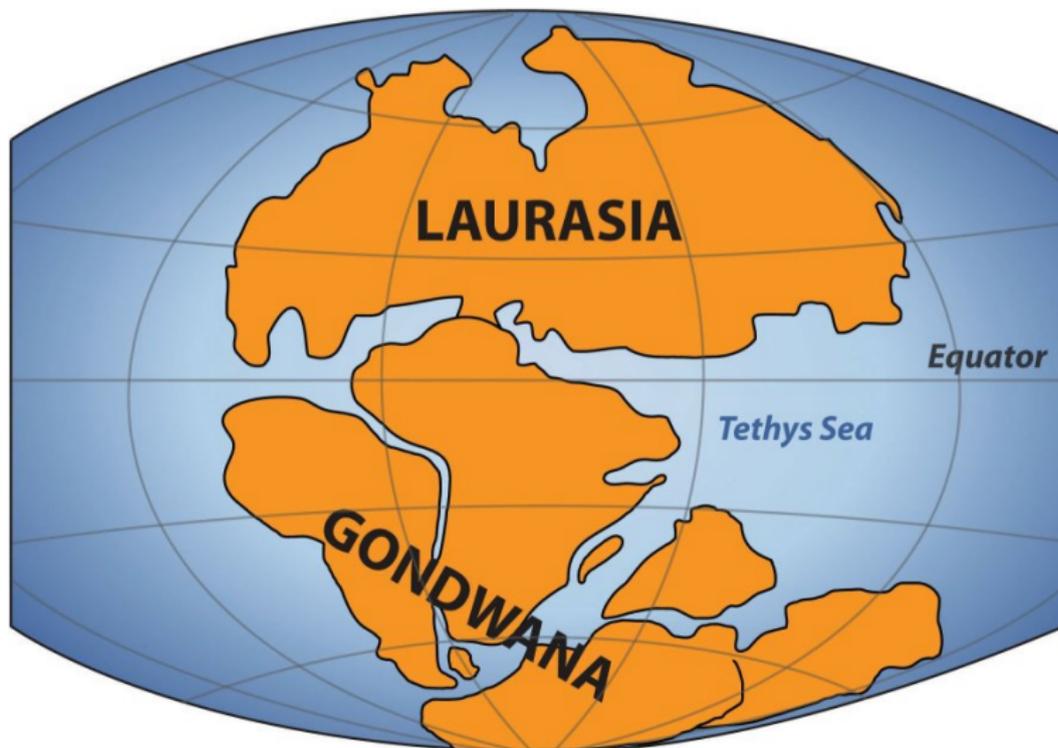
- ▶ In 1921, Alfred Wegener invented the idea that South America and Africa were parts of one big continent—Gondwana.
- ▶ According to Wegener, in the end of Paleozoic era, there were two big continents—Gondwana and Laurasia separated by Tethys ocean
- ▶ Before that, all continents were united in one—Pangaea surrounded by one big ocean.



One of Vegener's arguments



Laurasia and Gondwana



Pangaea



Mantle convection

- ▶ The driving force of floating continents is a **mantle convection**
- ▶ In ocean ridges, new ocean cortex is constantly forming and expanding
- ▶ In ocean trenches and continental ridges, different plates are colliding and often forming mountains

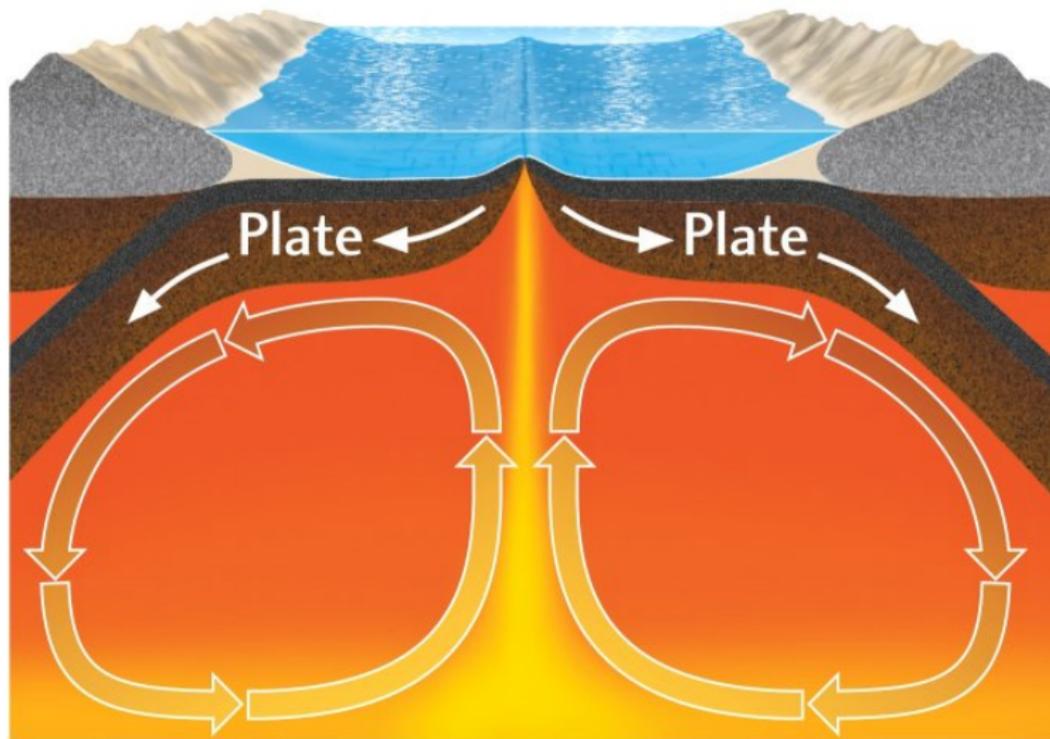


Summary

- ▶ Geological time is calculated on the basis of both relative (stratigraphy) and absolute (radioactivity) methods
- ▶ Continents of Earth are constantly changing their position due to the mantle convection (“plate tectonics”)
- ▶ In the past (Permian period) all continents formed super-continent Pangaea, which then broke into Laurasia and Gondwana



Mantle convection



For Further Reading



A. Shipunov.

Biogeography [Electronic resource].

2014—onwards.

Mode of access:

http://ashipunov.info/shipunov/school/biol_330

