

Biogeography

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Lecture 6

Outline

Basics of physical geography

Basics of climatology

Palaeogeography

Geological time

Plate tectonics

Outline

Basics of physical geography

- Basics of climatology

Palaeogeography

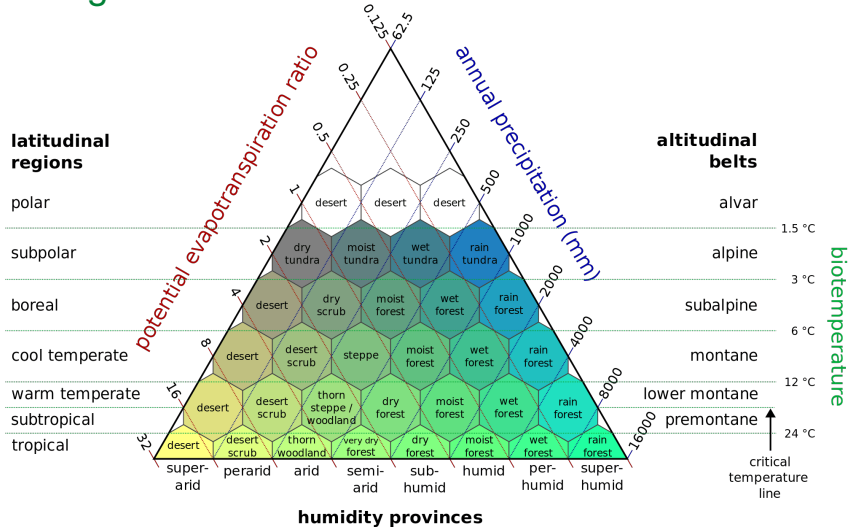
- Geological time

- 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

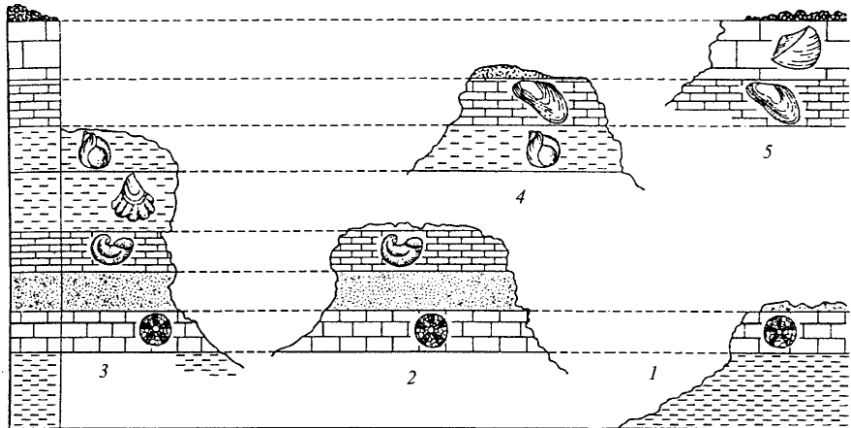
Use of radioactivity

- ▶ 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

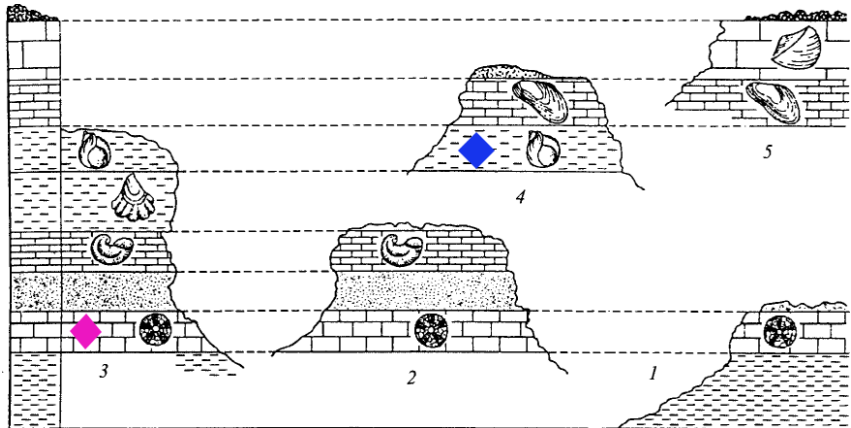
Stratigraphy

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

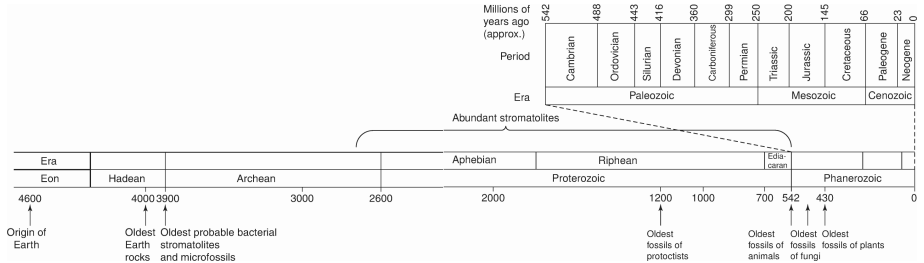
How stratigraphy works



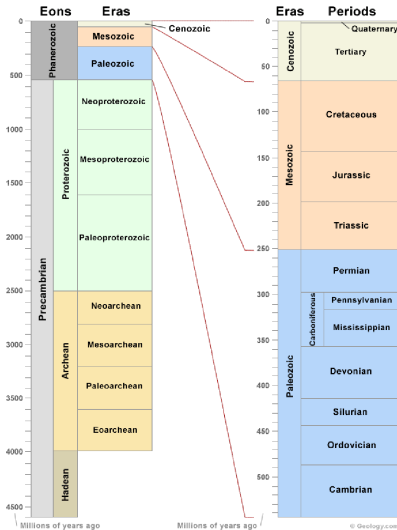
Stratigraphy and radioactivity work together



Geological scale



Geological scale (variant 2)



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

Palaeogeography

Plate tectonics

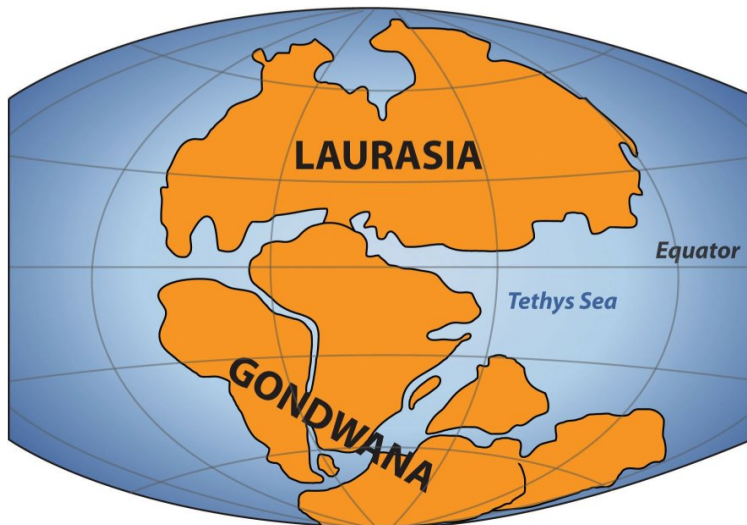
Continental drift

- ▶ 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 Wegener's arguments



Laurasia and Gondwana



Pangaea



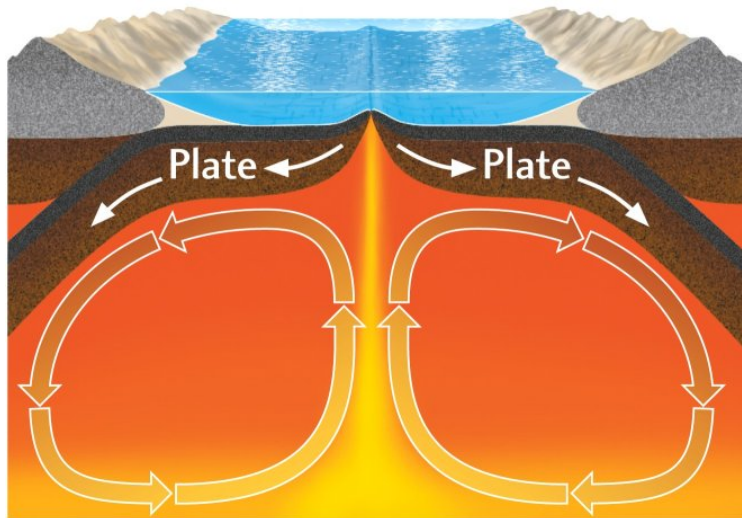
Mantle convection

- ▶ 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