

Concepts of Biology. Lecture 37

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December 8, 2014



1 Where we are?

2 Our time

- Cenozoic era
- Ecogeography: origin of biomes
- Biogeography: origin of provinces



1 Where we are?

2 Our time

- Cenozoic era
- Ecogeography: origin of biomes
- Biogeography: origin of provinces



Herbivore mammals triggered the process of dinosaur decline

Well, this is me who killed dinosaurs...



Our time

Cenozoic era



From Paleogene to Quaternary

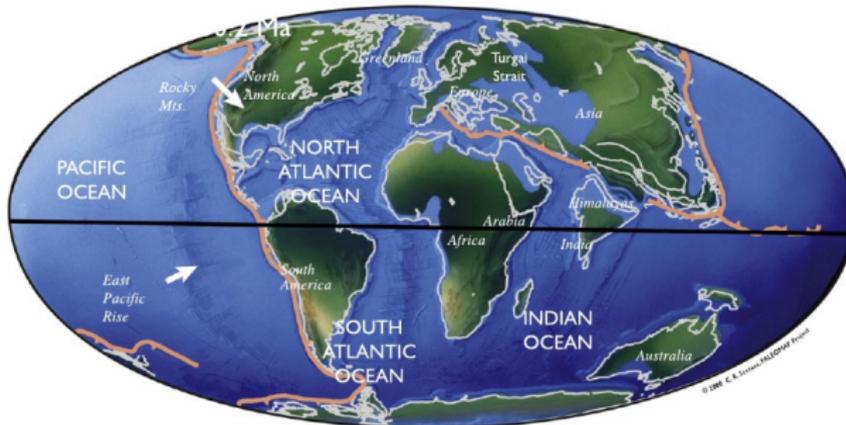
Cenozoic era:

- Paleogene: starts 66 Mya
Includes:
 - Paleocene
 - Eocene
 - Oligocene
- Neogene: starts 23 Mya
Includes:
 - Miocene
 - Pliocene
- Quaternary: starts 2.5 Mya
Includes:
 - Pleistocene
 - Holocene



Paleogene

50.2 Ma Paleogene



- Warm, even climate
- South America isolated, Tethys sea is slowly closing, India moves to Asia
- Mammals fill the big size class



Paleogene: when most of mammal order appeared

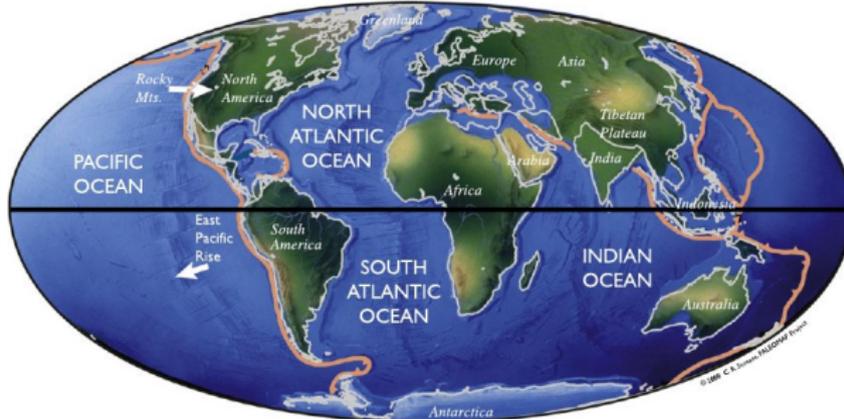


Paleogene: when aliens temporarily took empty niches



Neogene

14 Ma Neogene

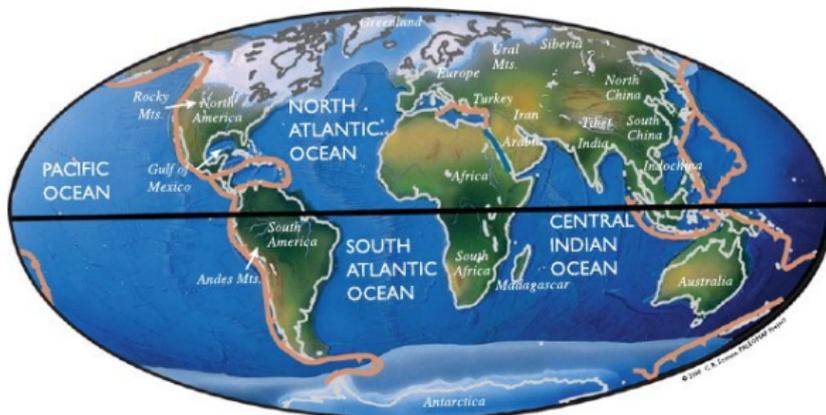


- Colder and drier
- Ice covers Antarctic, Americas united
- Grasses and hooved mammals form grasslands



Quaternary

21000 Years Quaternary



- Great glaciation again (the last was in Carboniferous)
- Rocky Mountains and Himalayas
- Humans



Our time

Ecogeography: origin of biomes

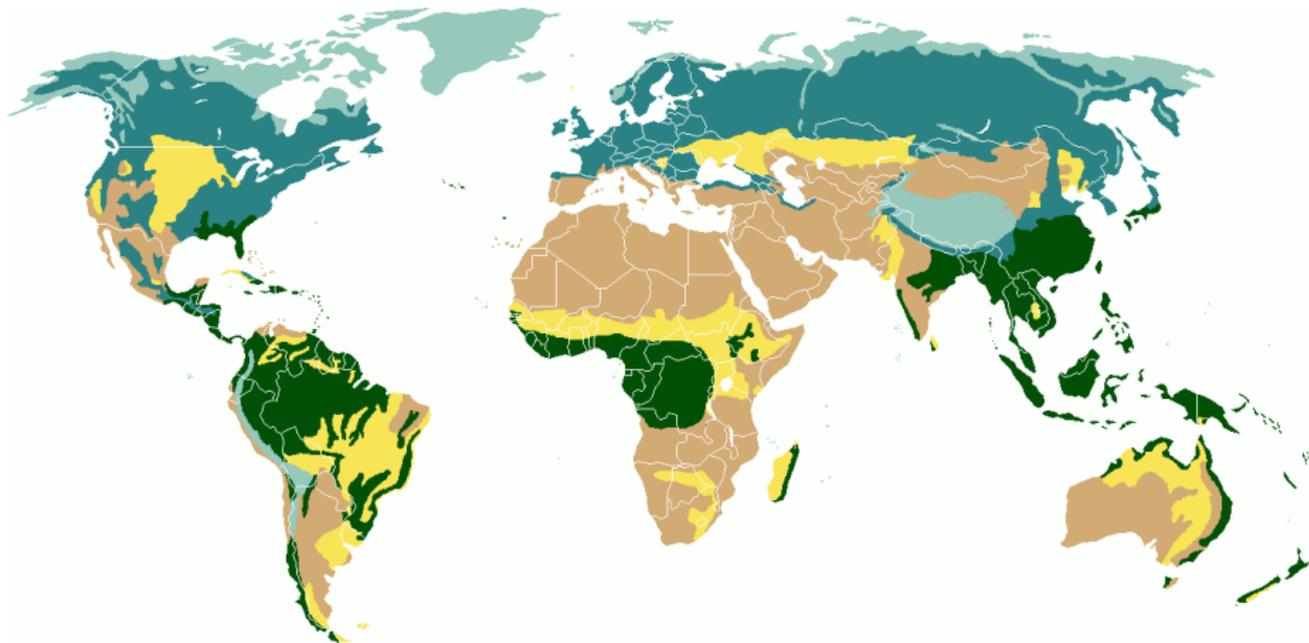


Ecogeography

- The science which study the distribution of main ecosystems (biomes)
- Biomes are mostly based on vegetation



Map of Earth biomes (simplified from Wikipedia)



Tundra, boreal forests, grasslands, deserts, tropical forests



Origin of biomes

- Tundra: Quaternary, the newest biome
- Boreal forests: Paleogene, note the dominance of conifers
- Grasslands: Neogene, supports by both animals and plants
- Deserts: Permian (very old!)
- Tropical forests: Paleogene, “made” by plants and insects



Our time

Biogeography: origin of provinces

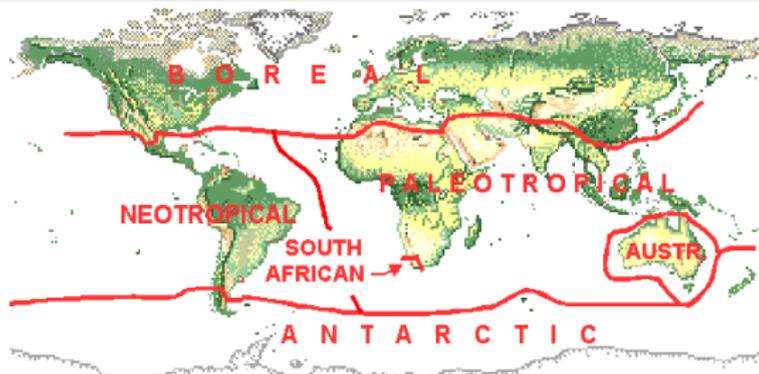


Biogeography

- Studies the distribution of plant and animal groups (not ecosystems!)
- It is more tightly related with phylogeny and evolution



Botanical and zoological maps of the world

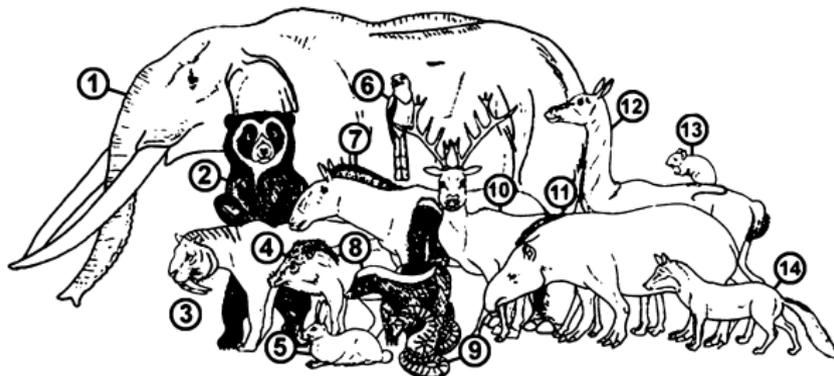
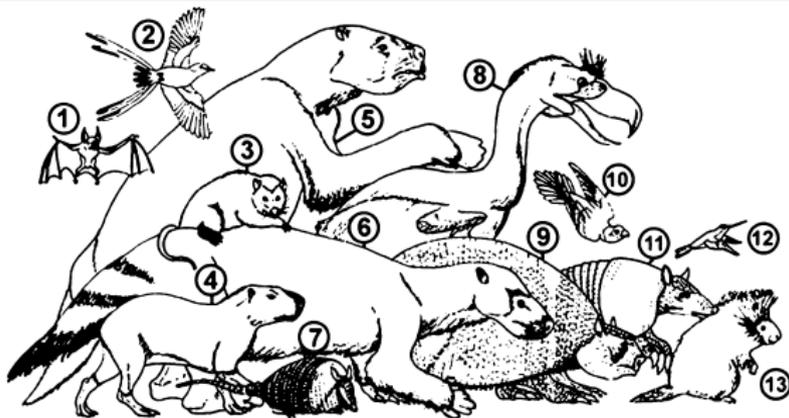


Great American Interchange

- Before Neogene, South America was an isolated continent like Australia now and keeps very unusual fauna
- Formation of the Isthmus of Panama led to the dramatic exchange in fauna between South and North Americas
- More advanced northern animals invaded South America but some of southern species (like armadillo, porcupines, opossums, giant sloth) became very successful on the North.



Great American Interchange: north and south



Some of this fauna lives now or was exterminated by early humans



For Further Reading



Ecogeography.

<http://en.wikipedia.org/wiki/Biome>



Phytogeography.

<http://en.wikipedia.org/wiki/Phytogeography>



Great American Interchange.

http://en.wikipedia.org/wiki/Great_American_Interchange

