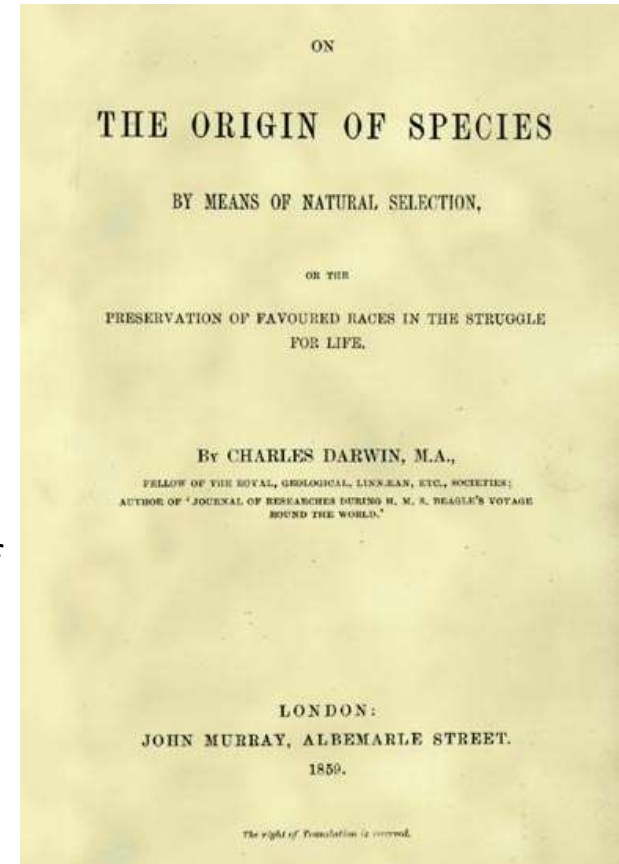


*Descent with
Modification:
A Darwinian
View of Life*

Evolution

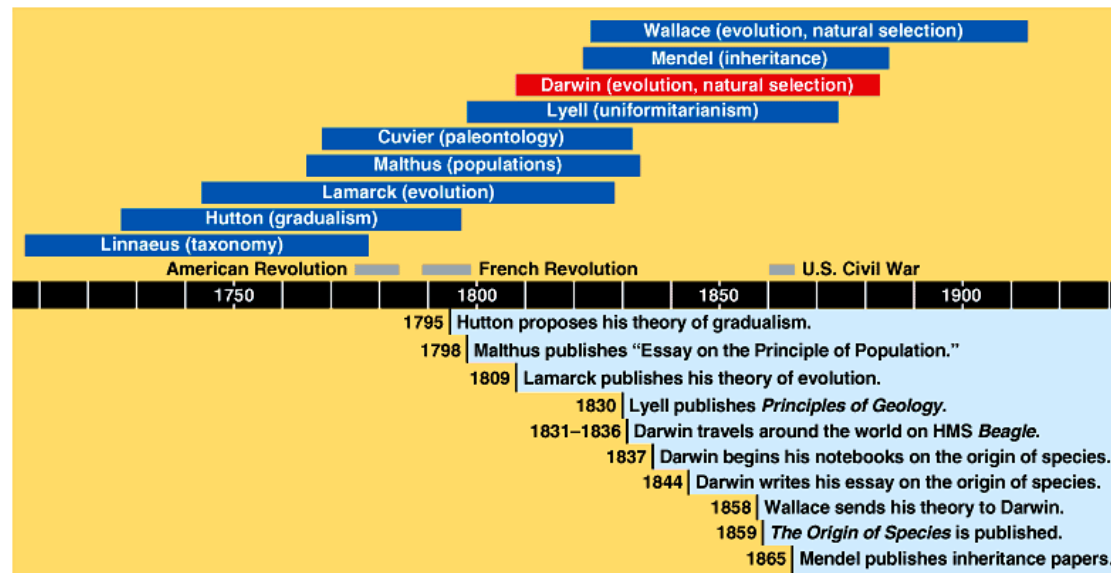
- Evolution: *the change over time of the genetic composition of populations*
- Natural selection: *populations of organisms can change over the generations if individuals having certain heritable traits leave more offspring than others (differential reproductive success)*
- Evolutionary adaptations: *a prevalence of inherited characteristics that enhance organisms' survival and reproduction*



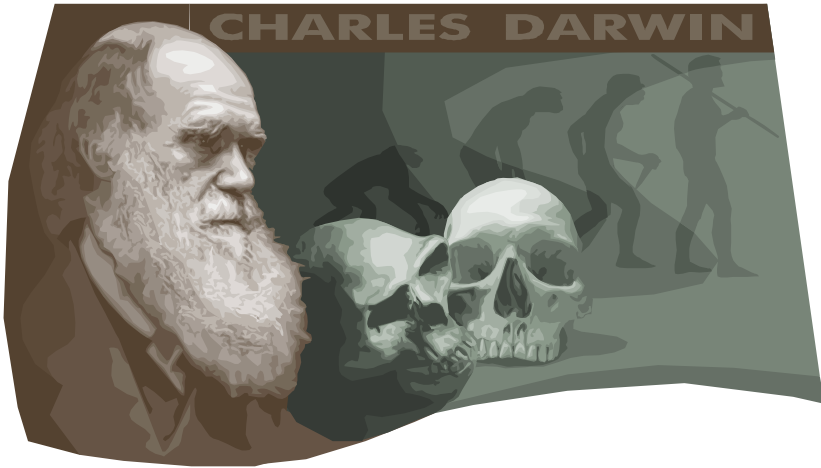
November 24, 1859

Evolutionary history

1. Linnaeus: taxonomy
2. Hutton: gradualism
3. Lamarck: evolution
4. Malthus: populations
5. Cuvier: paleontology
6. Dobhansky: modern synthesis
7. Lyell: uniformitarianism
8. Darwin: evolution
9. Mendel: inheritance
10. Wallace: evolution
11. Weisman: gametes and somatic cells
12. DeVries: pangenesis



1 Page Poster Assignment



- Picture of scientist
- Picture that represents his contribution to evolution
- Dates of birth and death
- Major field of study
- Educational background
- Contribution to evolutionary thought
- A quote that sums it all up

Descent with Modification, I

- 5 observations:
- 1- Exponential fertility
- 2- Stable population size
- 3- Limited resources
- 4- Individuals vary
- 5- Heritable variation

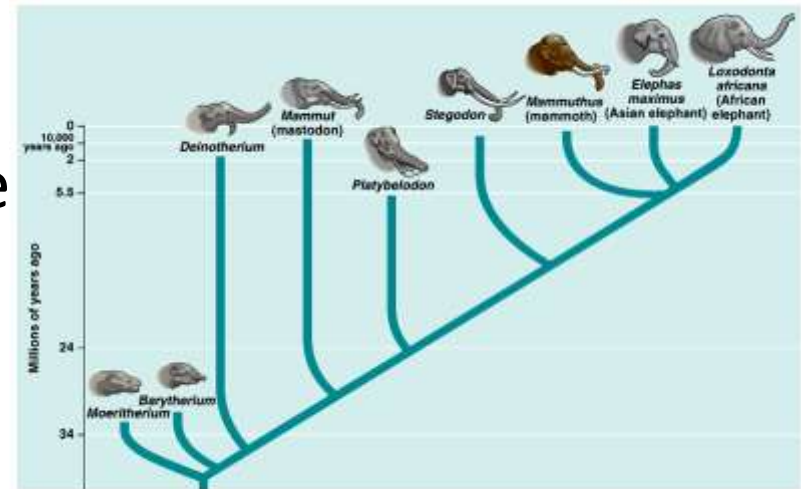


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Descent with Modification, II

- 3 Inferences:

- 1- Struggle for existence
- 2- Non-random survival
- 3- Natural selection (differential success in reproduction)

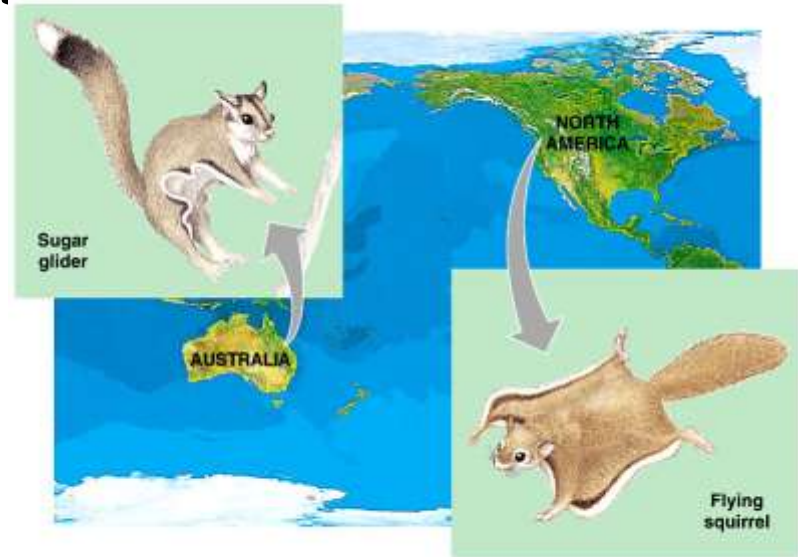


Evolution evidence: Biogeography

- Geographical distribution of species

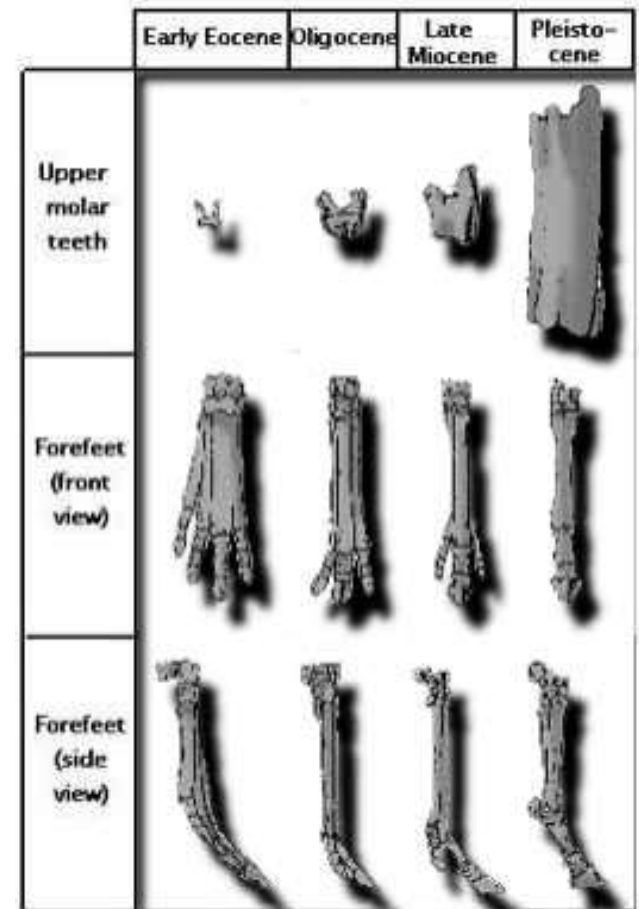
- Examples:

Islands vs. Mainland
Australia
Continents



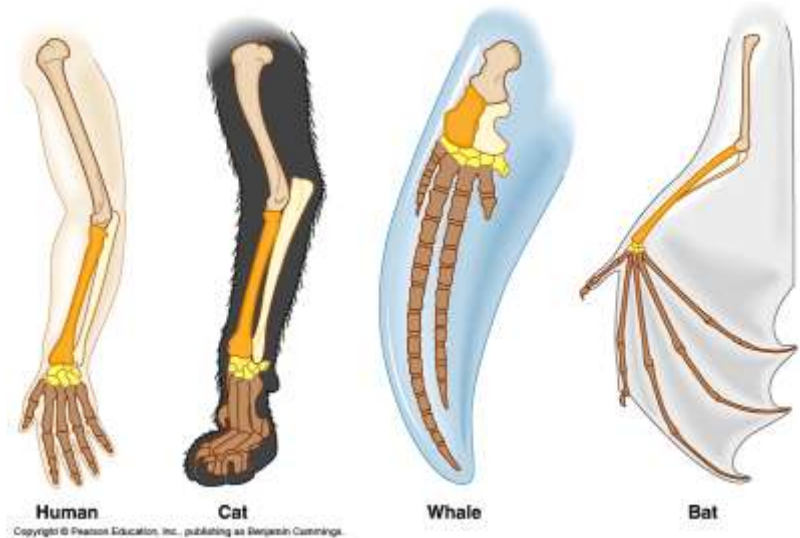
Evolution evidence: The Fossil Record

- Succession of forms over time
- Transitional links
- Vertebrate descent



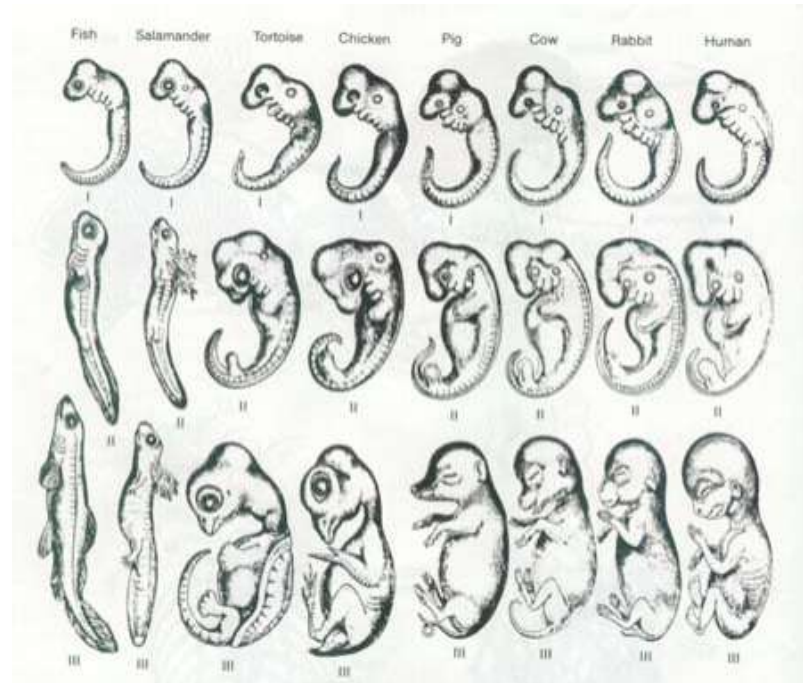
Evolution evidence: Comparative Anatomy

- Homologous structures (homology)
- Descent from a common ancestor
- Vestigial organs
Ex: whale/snake hindlimbs; wings on flightless birds



Evolution evidence: Comparative Embryology

- Pharyngeal pouches, 'tails' as embryos









Evolution evidence: Biology

Molecular

- Similarities in DNA, proteins, genes, and gene products
- Common genetic code

Table 22.1 Molecular Data and the Evolutionary Relationships of Vertebrates

Species	Number of Amino Acids That Differ from a Human Hemoglobin Polypeptide (Total Chain Length = 146 Amino Acids)
Human 	0
Rhesus monkey 	8
Mouse 	27
Chicken 	45
Frog 	67
Lamprey 	125

Final words.....

- *“Absence of evidence is not evidence of absence.”*

