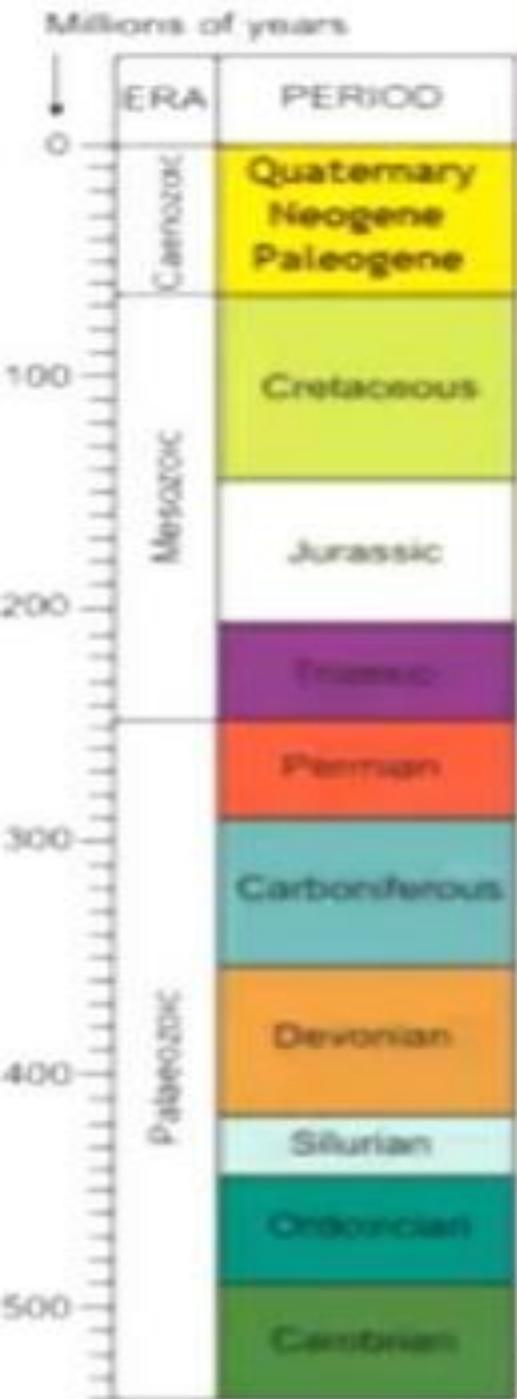


GEOLOGICAL TIME SCALE & GEOLOGICAL ERA

**Prof.Nuzhat Jahan
Department Of Zoology
Karim City College.**



4. Phanerozoic eon (600 MYA – present)

3. Cenozoic era (65 MYA to date)

- Plenty of fossils (all modern animals and plants)
- subdivided into Tertiary (Paleogene & Neogene) and Quaternary periods.
- Further this era contains seven epochs
- Through fossils: The origin and evolution of independent groups of animals and man



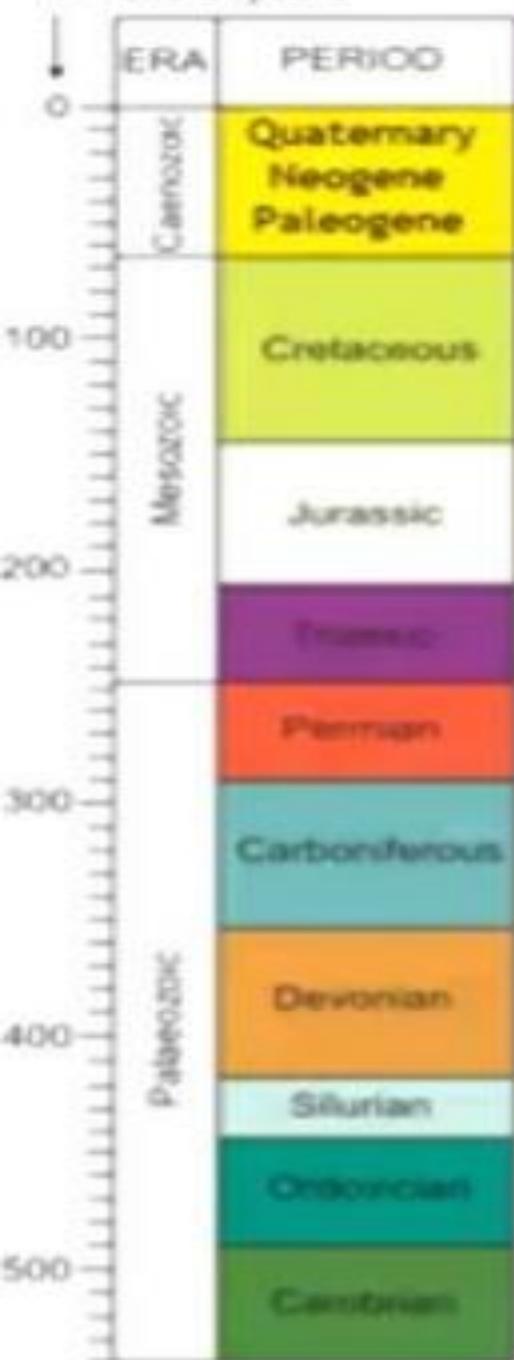
Ptilodus was a mammal the size of a squirrel that lived during the Paleocene.



Pyrotherium was a South American ungulate that lived during the Early Oligocene.



Millions of years



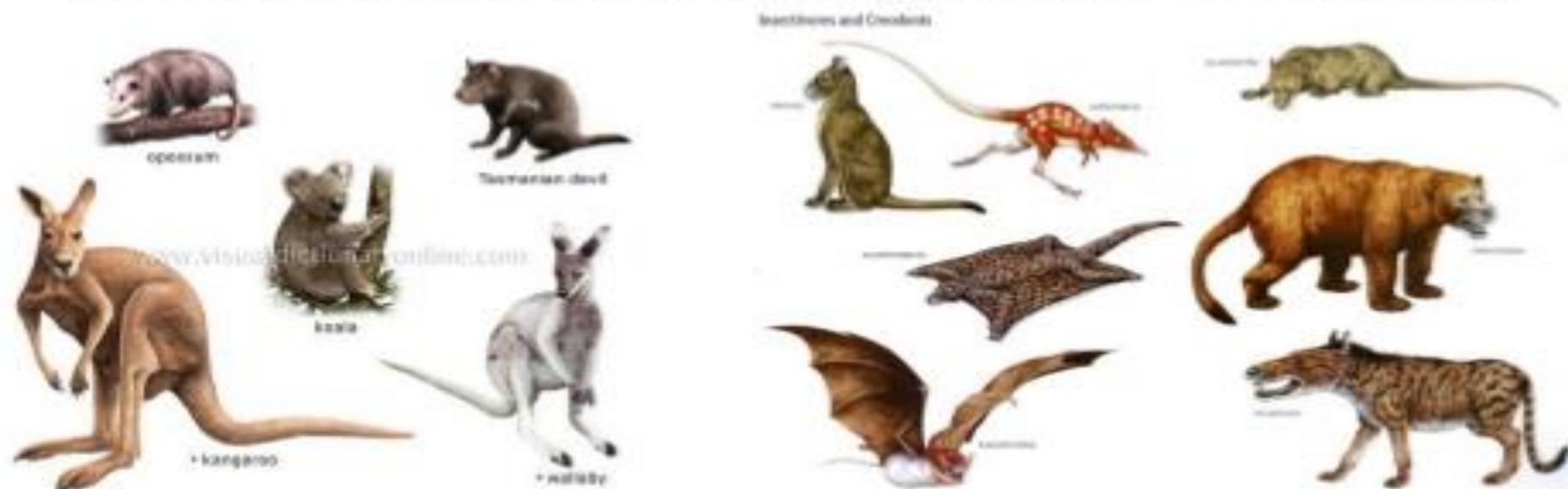
4. Phanerozoic eon (600 MYA – present)

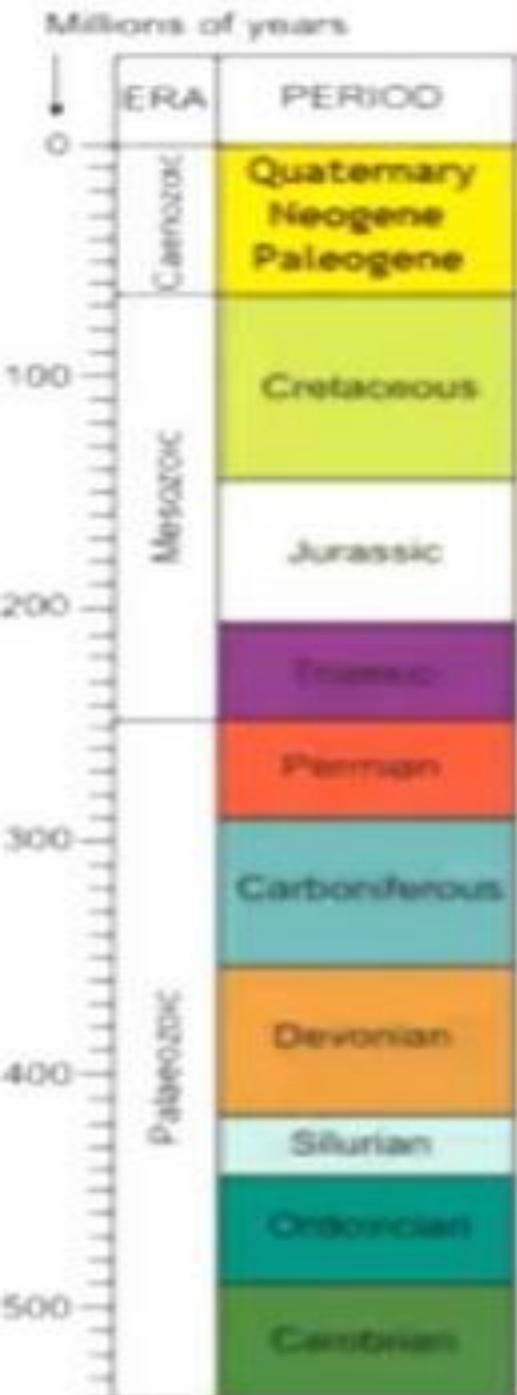
3. Cenozoic era (65 MYA to date)

A. Tertiary (Paleogene Period)

1. Paleocene epoch (65-54 m.y.a)

- Social insects achieve ecological dominance.
- Appearance of placental mammals (marsupials, insectivores, creodonts)





4. Phanerozoic eon (600 MYA – present)

3. Cenozoic era (65 MYA to date)

A. Tertiary (Paleogene Period)

2. Eocene Epoch (54-38 mya)

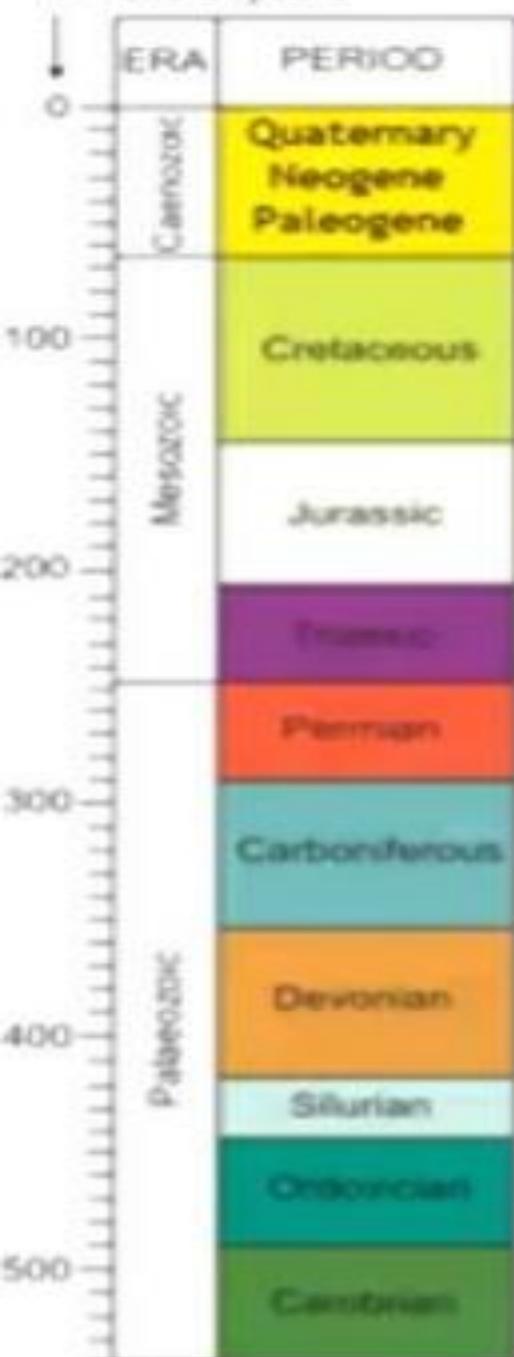
- Ungulates originated.
- The ancestral form of modern horses lived
- The Azolla Event- freshwater fern blooms die at the bottom of Arctic Sea, drawing down large amounts of CO₂ (reduced by 80%) and triggering an ice age



FIG. 34.—The skeleton of *Hyrachtherium*, an ancestor of the modern horse, found in Eocene strata.



Millions of years



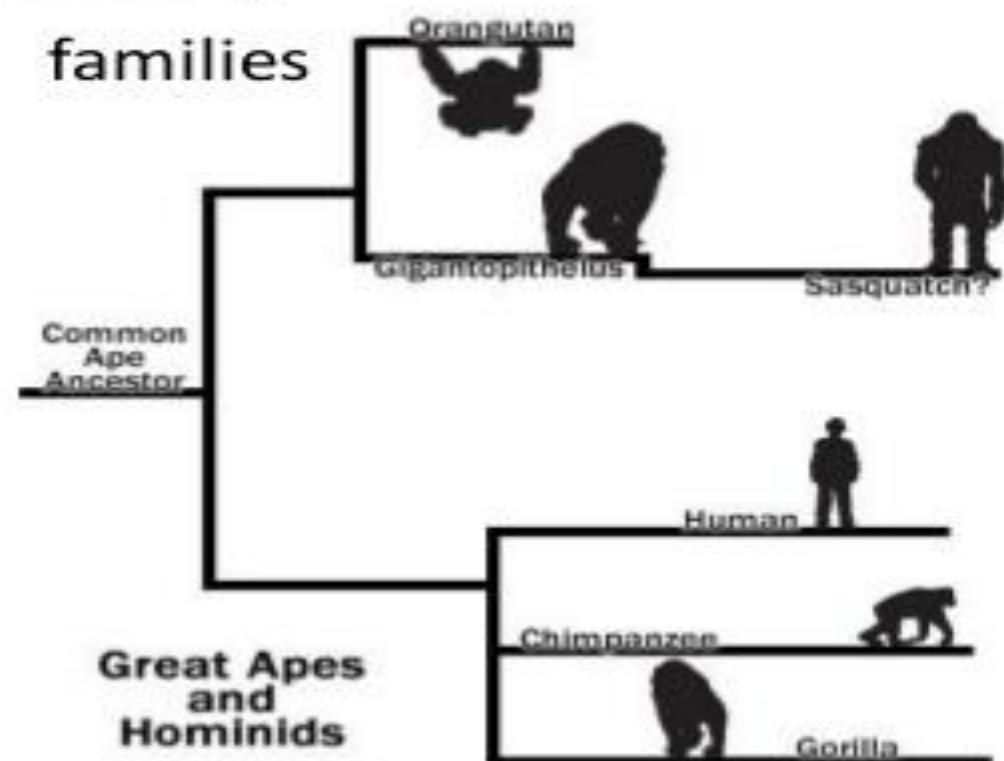
4. Phanerozoic eon (600 MYA – present)

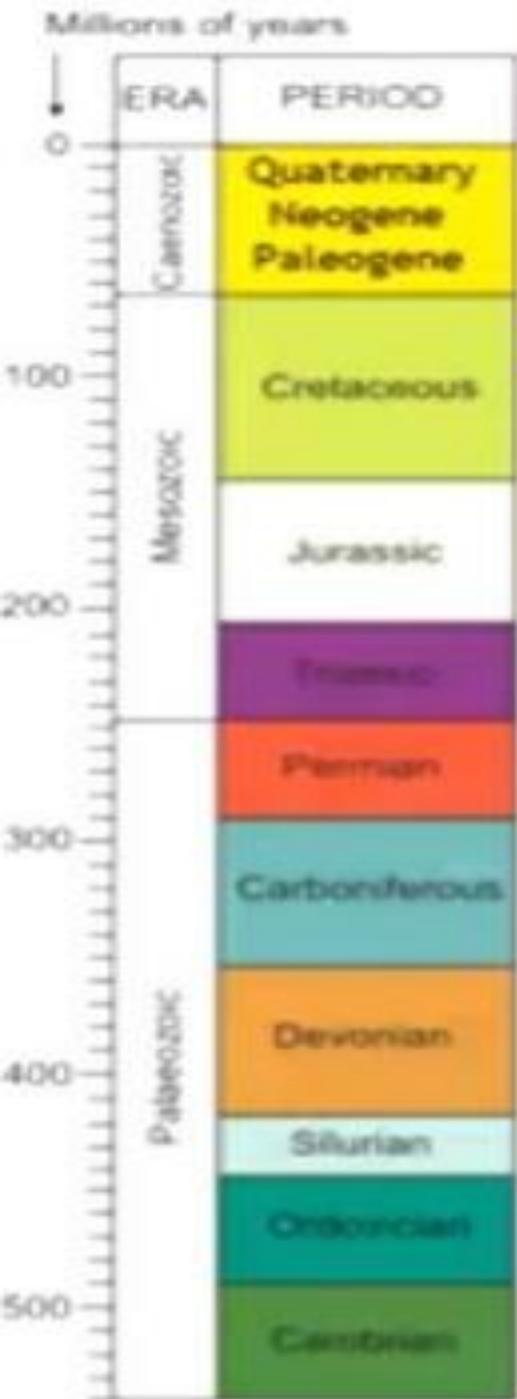
3. Cenozoic era (65 MYA to date)

A. Tertiary (Paleogene Period)

3. Oligocene epoch (38-26 mya)

- Several animals with ancient characteristics became extinct.
- Mammals continue to diversify
- Modern mammalian families established.
- Apes originated





4. Phanerozoic eon (600 MYA – present)

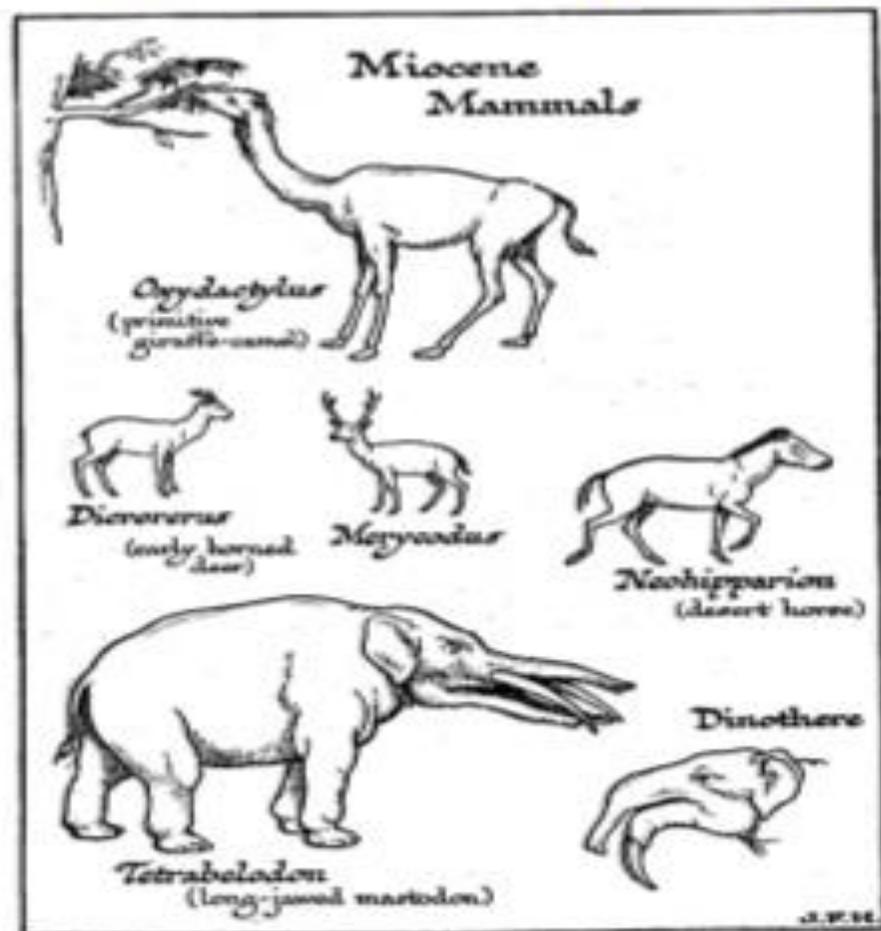
3. Cenozoic era (65 MYA to date)

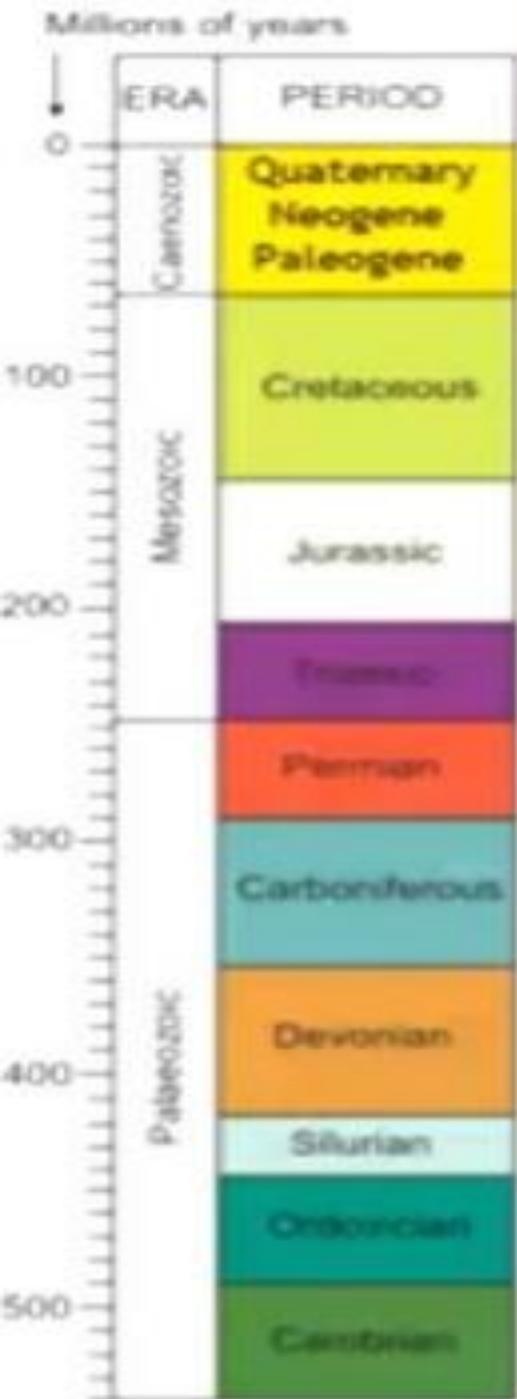
A. Tertiary (Neogene Period)

1. Miocene epoch - (26-7 m.y.a)

➤ Several varieties of grasses evolved in Europe and N. America (large prairies formed).

➤ These changes encouraged the evolution of fast running herbivorous mammals and their predators.





4. Phanerozoic eon (600 MYA – present)

3. Cenozoic era (65 MYA to date)

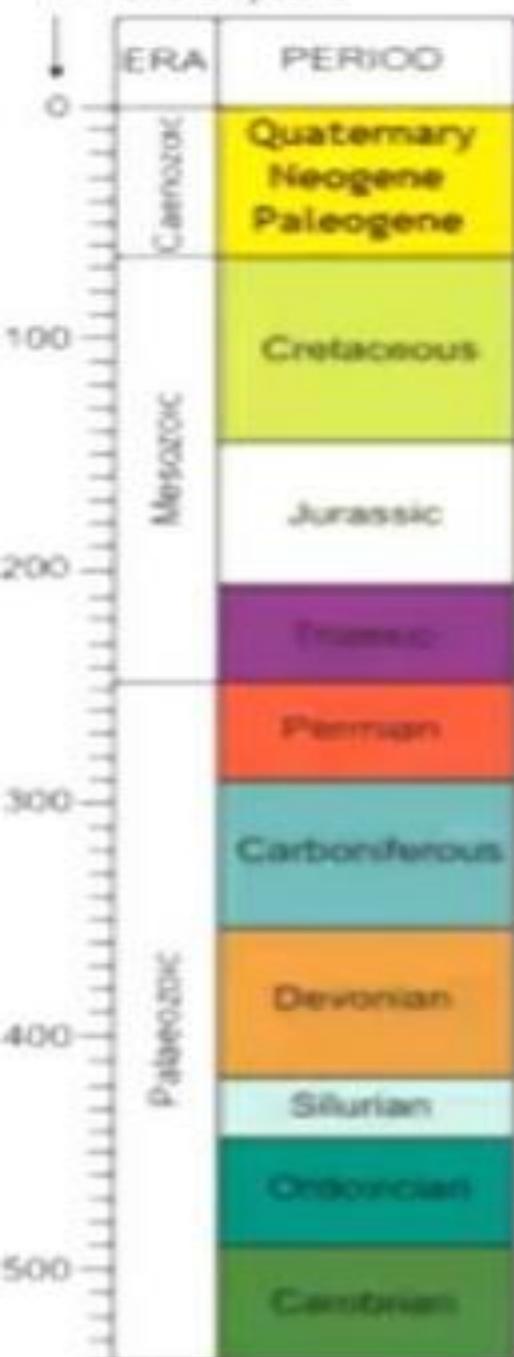
A. Tertiary (Neogene Period)

2. Pliocene Epoch - (7-2 mya)

- Prairie's enlarged still further in several regions.
- Rodents became more successful.
- mammals increased in number.
- Appearance of *Australopithecus*, genus of hominids.



Millions of years



4. Phanerozoic eon (600 MYA – present)

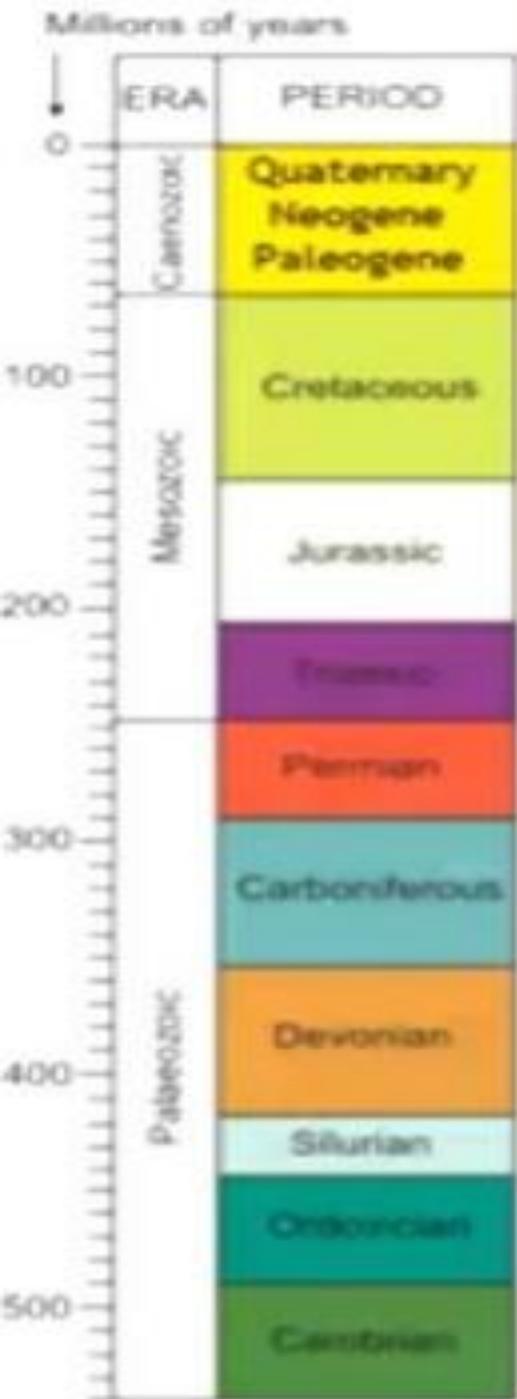
3. Cenozoic era (65 MYA to date)

B. Quaternary Period

1. Pleistocene epoch - (2-1 mya)

- Several glaciations happened
- popularly called the 'modern Ice age'.
- *Homo habilis* appeared
- *Homo erectus* first moves out of Africa
- The evolution of horses and man reached the final stages
- *Homo sapiens* appeared.
- Today we are living in an inter-glacial Period.





4. Phanerozoic eon (600 MYA – present)

3. Cenozoic era (65 MYA to date)

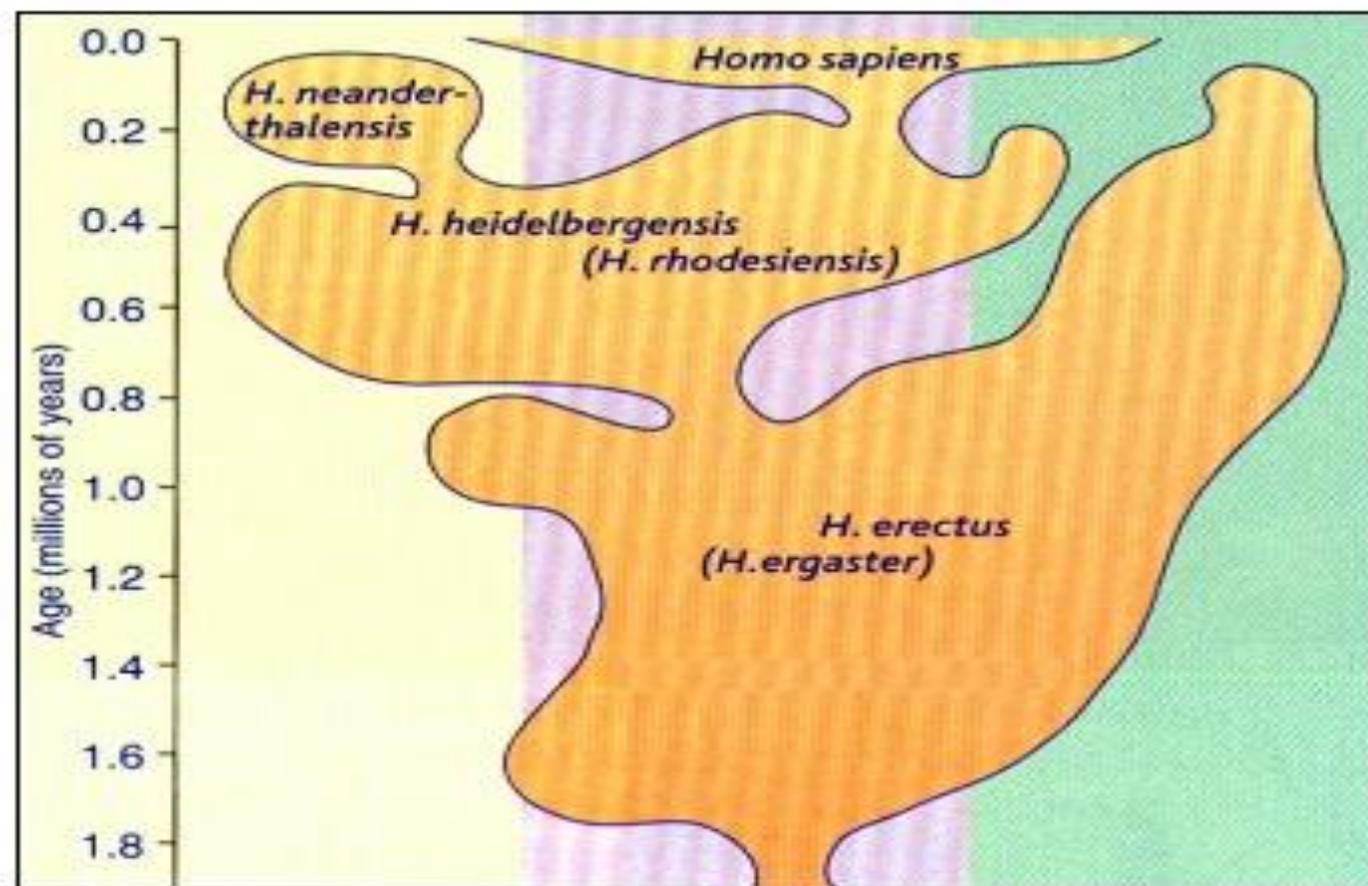
B. Quaternary Period

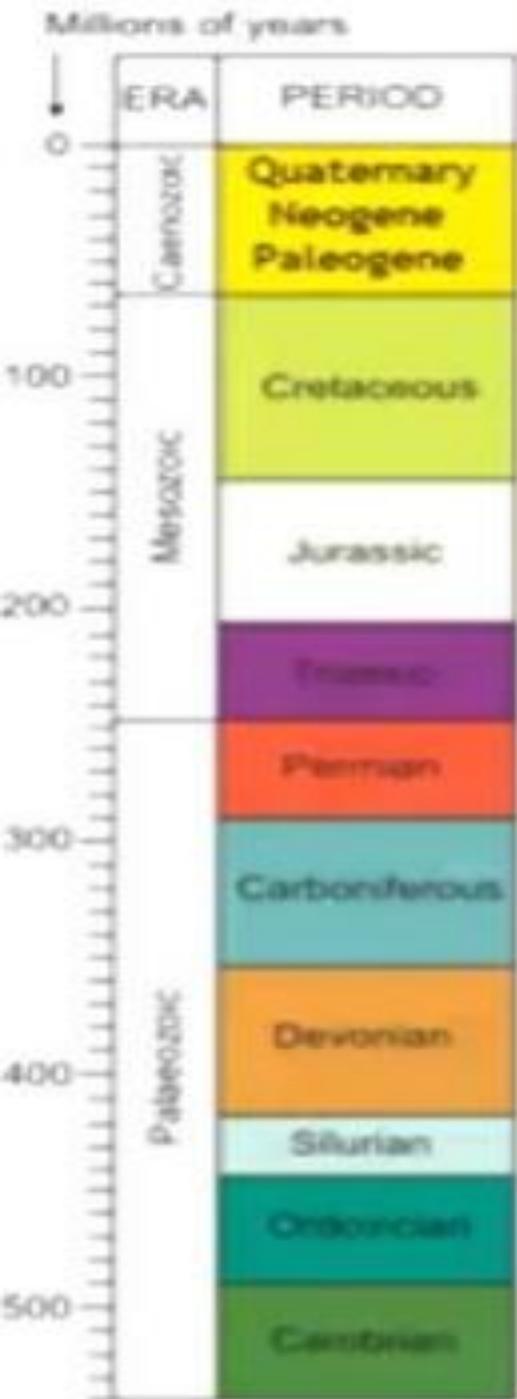
1. Pleistocene epoch - (2-1 mya)

Europe

Africa

Asia





4. Phanerozoic eon (600 MYA – present)

3. Cenozoic era (65 MYA to date)

B. Quaternary Period

1. Holocene epoch : (1 mya-present)

THE MODERN WORLD

- Development of agriculture.
- Domestication of animals.
- 250 yrs ago: Start of the Industrial Revolution
- 50 yrs ago: Space travel
Humans walk on the surface of the moon (1969).
- Animal cloning (Dolly the sheep)
- Animal and Plant hybridization
- Improved communication
- Health care development
- Biotechnology



Phanerozoic Eon in brief:

ERA	PERIOD	START OF EACH PERIOD (in millions of years)	FLORA & FAUNA
Cenozoic	Quaternary	1	Modern species of mammals, extinction of large forms, such as mammoth; dominance of human
	Tertiary	54	Rise of birds and placental mammals
Mesozoic	Cretaceous	65	Dominance of flowering plants; extinction of large reptiles and ammonites by end of period
	Jurassic	145	Reptiles dominant on land, sea and in air; first birds; archaic mammals
	Triassic	208	First dinosaurs, turtles, ichthyosaurs, plesiosaurs; cycads and conifers dominant
Paleozoic	Permian	245	Radiation of reptiles, which displace amphibians as dominant group; widespread glaciation
	Carboniferous	286	Ferns as dominant plant group; sharks and crinoids abundant; radiation of amphibians; first reptiles
	Devonian	360	Age of fishes (mostly freshwater); first trees and first amphibians
	Silurian	408	Invasion of the land by plants and arthropods; brachiopods; primitive jawless vertebrates
	Ordovician	438	Appearance of vertebrates (armoured fishes); brachiopods and cephalopods dominant
	Cambrian	505	Appearance of all invertebrate phyla and many classes; dominance of trilobites and brachiopods;

IMPORTANT PERIODS IN THE HISTORY OF EARTH

i) Carboniferous Period

It lasted from 360 million years to 300 Million years. It is an important period of Paleozoic era.

During this period, first reptiles and pteridophytes were formed and coal plants got spread. The dead bodies got buried in this period forming the coals that we use today.



ii) Permian

It lied between 300 million years to 250 million years. It is also an important period of Palaeozoic era. Largest mass extinction happened in this period. Scientists are not sure what caused this mass extinction (maybe climate change & volcanoes). 90% of ocean life and 78% of land life died.



iii) Jurassic

Jurassic is an important period of Mesozoic era. It lasted from 250 million years ago to 200 million years ago. During this period, first birds and mammals were formed. Gymnosperms were dominating plants. The dinosaurs were formed in Triassic period reached at their peak in this period.



iv) Cretaceous

It is a period of Mesozoic era which lasted from 150 million years ago to 65.5 million years ago. It marked the end of the Mesozoic Era and the beginning of the Cenozoic Era. All of the dinosaurs and half of the other animals & plants went extinct in this period. Scientists think an asteroid hit Earth, the dust clouds blocked out the sun. As a result, plants died, then herbivores, then carnivores.



v)Quarternery period

It is a period of Cenozoic era which has been lasting from 1.8 million years ago to present days. In this period, the humans evolved as the most intelligent creature of earth and took over. It is divided into 2 epochs namely: Pleistocene and Holocene.



