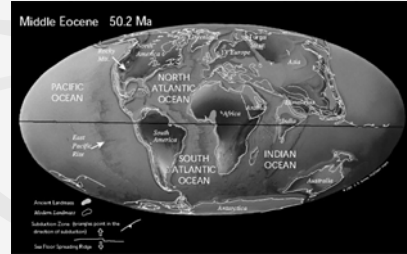


Brontotheres and Other Big Brutes: Evolution of Large Mammals

The Tertiary

The Tertiary witnessed the diversification of many mammalian and bird groups, flourishing in the tropical conditions.

During the early Tertiary the continents were isolated by shallow seas, and different lineages of mammals evolved on each one (but not before a bit of a lag in replacement in the earliest Paleocene)



Earliest Tertiary



On land, many new types of mammals appear in a dramatic evolutionary radiation, filling the ecological roles vacated by the dinosaurs.

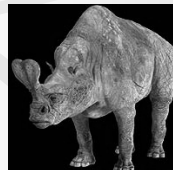
But compared to the majestic Cretaceous megafauna, these animals were puny.

Dominant forms were hold-overs from the Cretaceous and quickly died out as large-scale replacement commenced

By Eocene, mammals included many giant yet small-brained rhinoceros-like types - the Asiamerican uintatheres and brontotheres

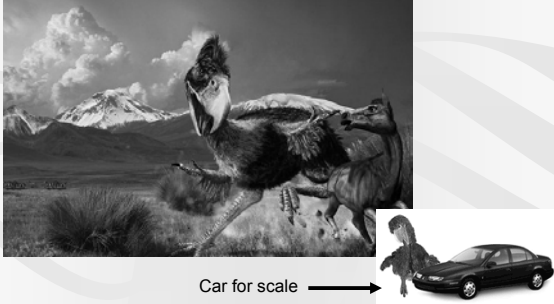


Uintatherium robustum¹⁸⁷²
uintathere mammal
Eocene (54-58 million years ago)



Uintatheres, brontotheres, and other rhino-like mammals: Tertiary ecological equivalents to the large herbivorous dinosaurs ?

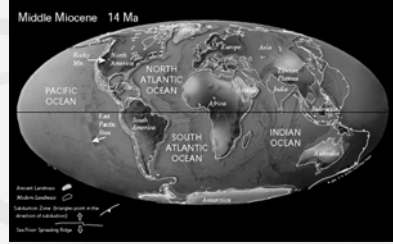
There were huge flightless carnivorous birds (phorusrachids) - 2 metres tall with curved beaks, that mimicked the great theropod dinosaurs of the Mesozoic.



Late Tertiary

During the late Tertiary modern mammals and flowering plants evolve, as well as many strange mammals that are no longer around.

Shrinkage of inland seas plus plate movements create land bridges (especially between Africa and Eurasia, then North and South America – Great American Biotic Interchange)



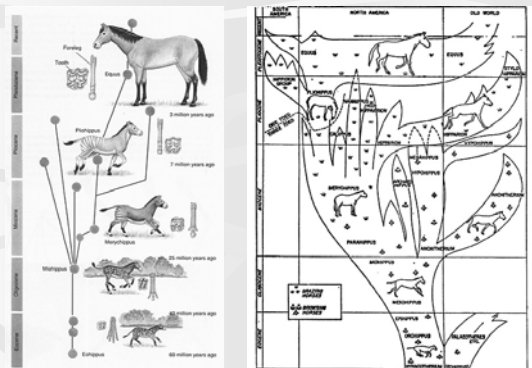
Late Tertiary

The most astonishing thing to happen during the Late Tertiary was the evolution of grass. This led to the evolution of long-legged running animals adapted to life on the savanna and prairie.

The horse family - Equidae - was a success story during the Late Tertiary. Horses and other grazing mammals evolved high-crowned teeth to cope with a diet of abrasive grass.



Horses: browsers to grazers



Originated in North America, migrated to South America and Europe, went extinct in North America

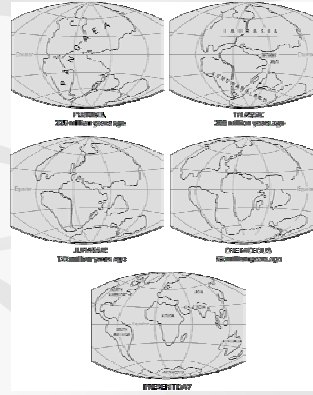
Late Tertiary (Pliocene)- Great American Biotic Interchange



Land bridge between North and South America– brought land mammals of different origins into competition (there were winners and losers)

Northern fauna won out, successfully invaded South America

Significance of Plate Tectonics to Interchange



Pangaea initially split into northern supercontinent Laurasia and southern supercontinent Gondwanaland (note mammals appear in around the Triassic)

Each supercontinent developed its own types of land mammals (dominated by placentals in Laurasia and by marsupials in Gondwanaland)

Supercontinents further split into smaller continents

Smaller continents came into contact, allowing interchange of Laurasian and Gondwanan faunas

Some extinction due to competition of two faunas

Another Event in Late Tertiary

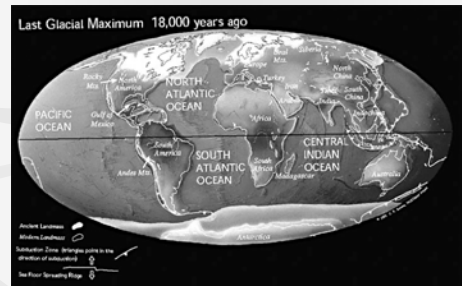


Meanwhile during the Late Tertiary Hominids appeared in the Africa savannas, the Australopithecines.

More on this in future lecture

Late Tertiary (Pleistocene)

Initiation of last Ice Age, climate much cooler !



Late Tertiary (Pleistocene), cont'd

More extinctions as climate cools.
There were still many forest animals
however. For example, the Mastodons
lived on every continent except
Australia.



END OF LECTURE