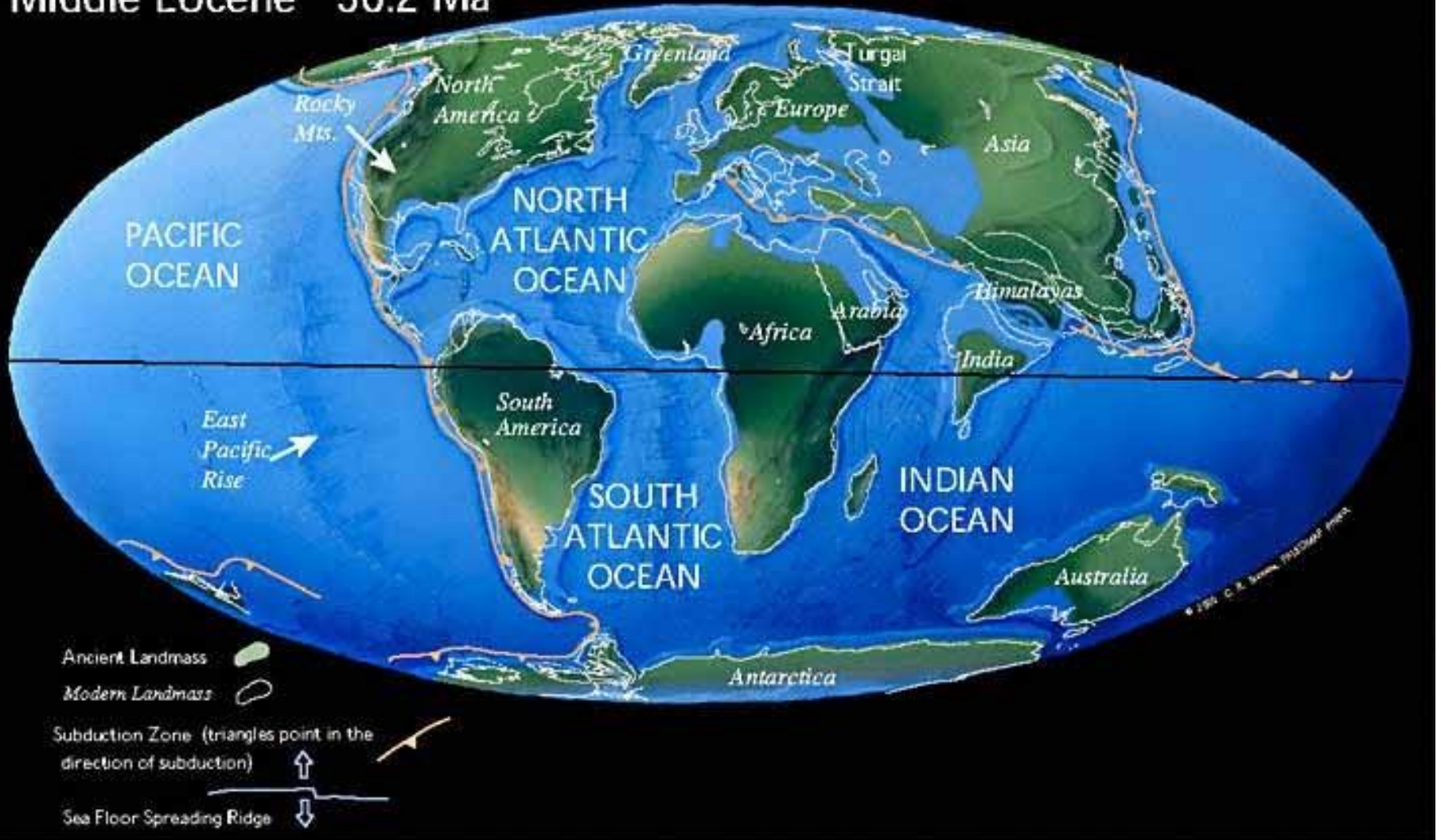


ИСТОРИЧЕСКАЯ ГЕОЛОГИЯ

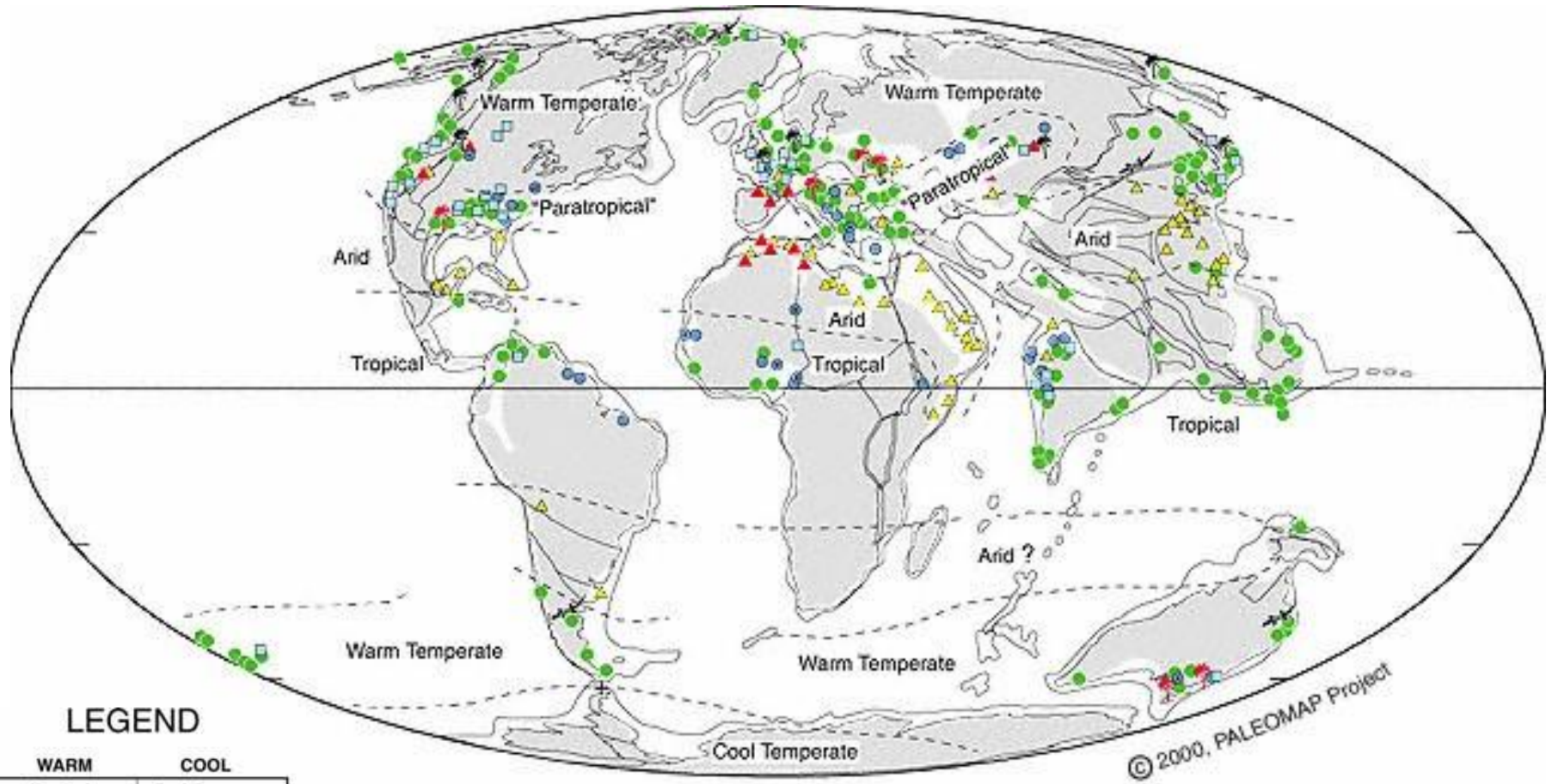
Палеогеновый период

Middle Eocene 50.2 Ma



Палеотектоническая реконструкция Земли

Климат

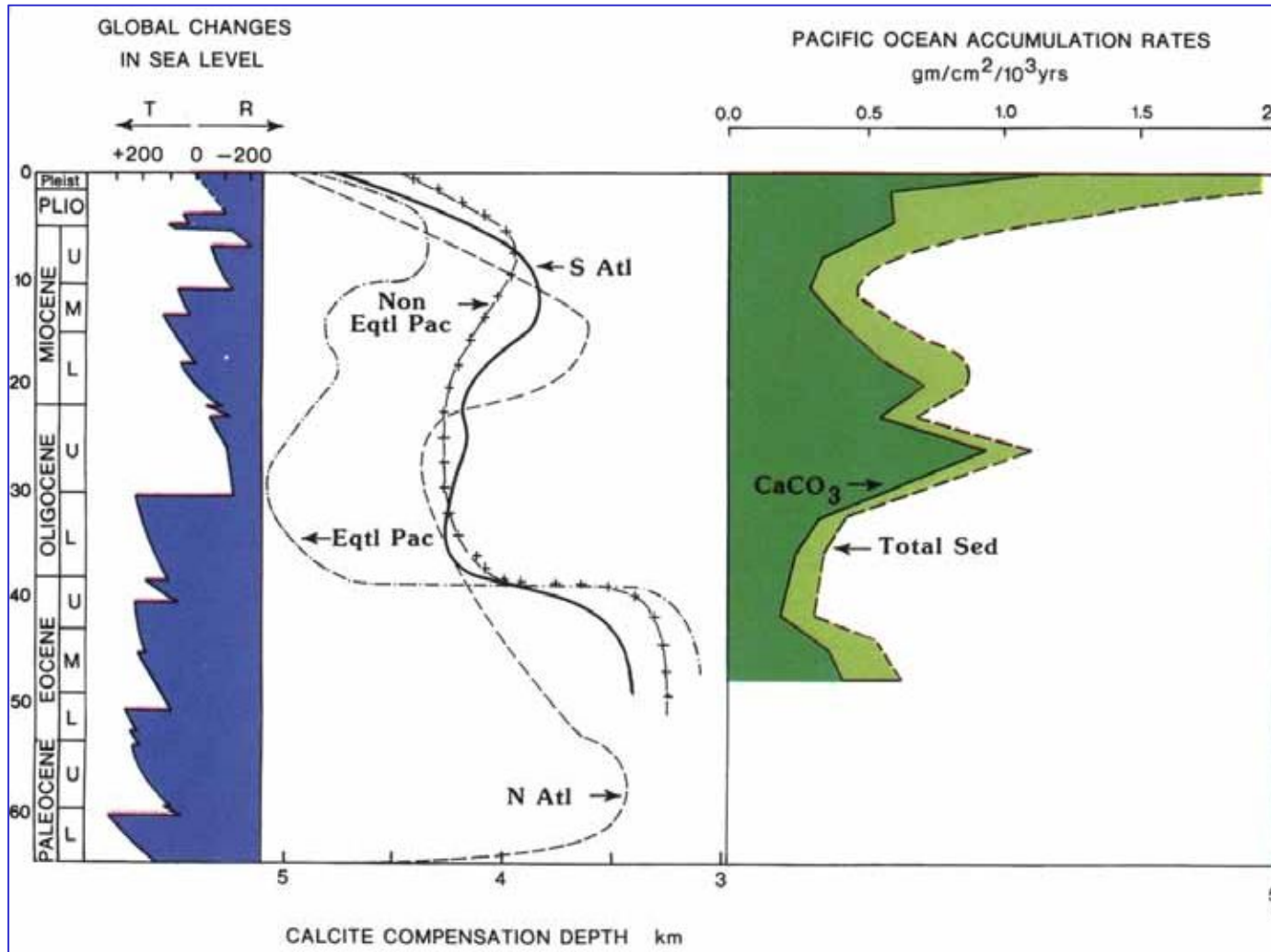


LEGEND

WARM		COOL	
<i>Tropical</i>		<i>Cool Temperate</i>	
● Coal	● Coal	● Coal & Tillites	
● Bauxite			
● Laterite			
<i>Warm Temperate</i>			
□ Kaolinite (& coal & evaporite)	→ Crocodiles	→ Palms & Mangroves	
<i>Arid</i>		<i>Cold</i>	
▲ Evaporite	+	⊕ Tillite	
▲ Calcrete		⊕ Dropstone	
		● Glendonite	

"Paratropical" = High Latitude Bauxites

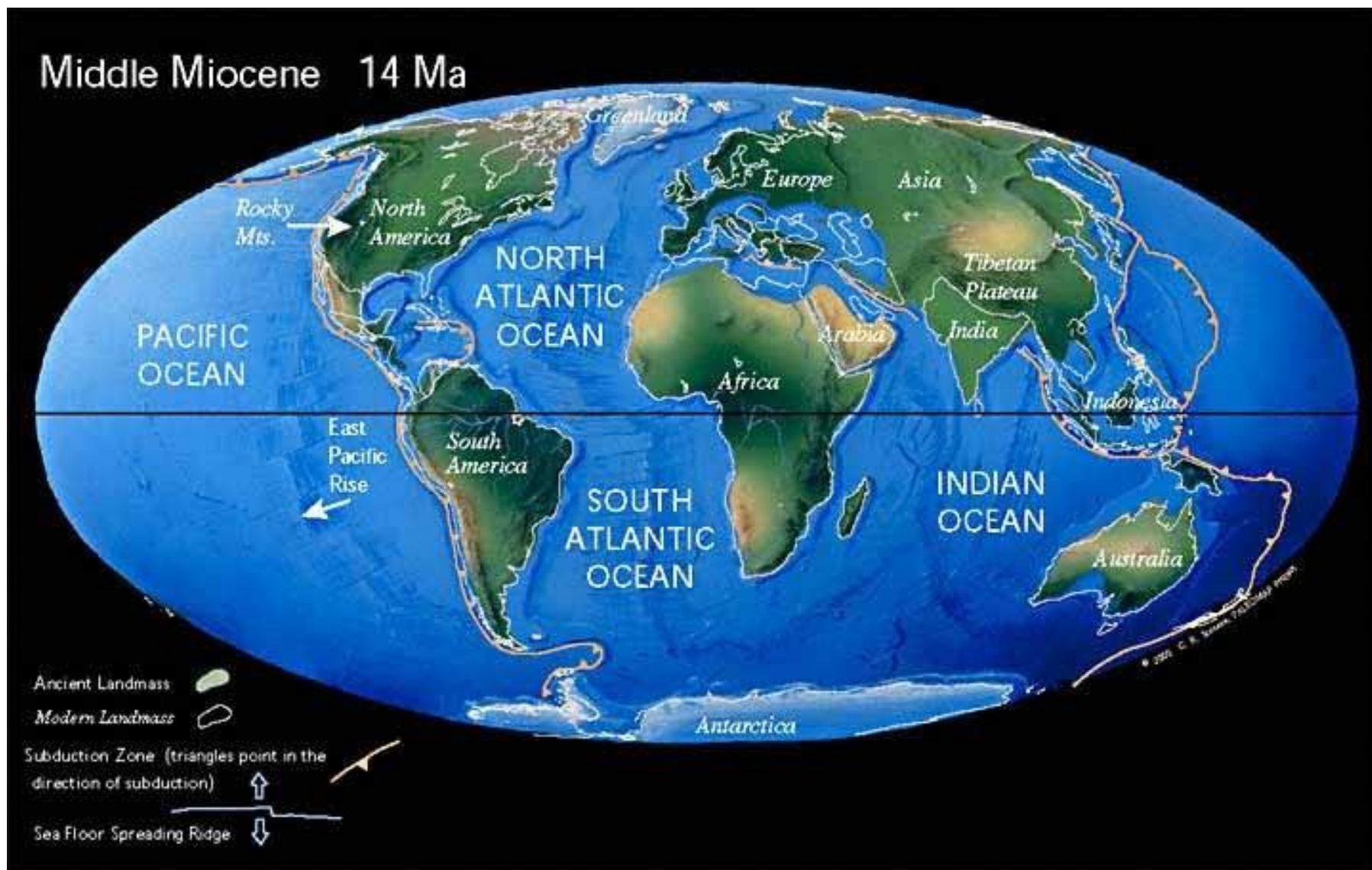
Палеогеновый период. Палеогеографические события



- Палеоцен - повышение УКК в Атлантике и Пасифике, олигоцен – его снижение; многочисленные ОАЕ; развитие системы апвеллингов и накопление фосфоритов

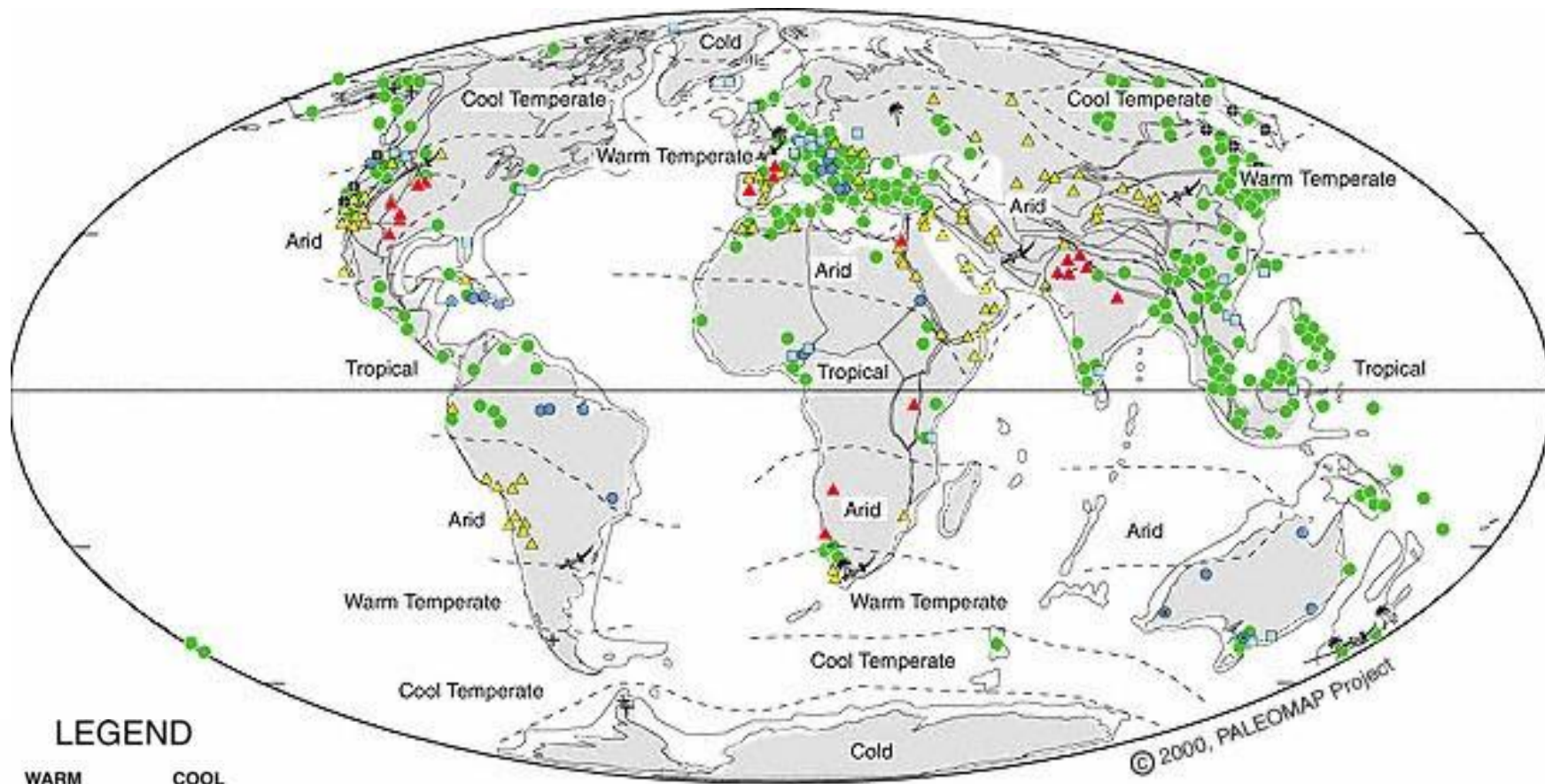
Неогеновый период

Middle Miocene 14 Ma



Палеотектоническая реконструкция Земли

Климат



LEGEND

WARM		COOL	
<i>Tropical</i>		<i>Cool Temperate</i>	
● Coal	● Coal & Tillites		
● Bauxite			
● Laterite			
<i>Warm Temperate</i>			
□ Kaolinite (& coal & evaporite)			
🐊 Crocodiles		🌴 Palms & Mangroves	
<i>Arid</i>		<i>Cold</i>	
▲ Evaporite	⊕ Tillite		
▲ Calcrete	⊕ Dropstone		
	● Glendonite		

Miocene

"Paratropical" = High Latitude Bauxites

Четвертичный период

Last Glacial Maximum 18,000 years ago



Палеотектоническая реконструкция Земли

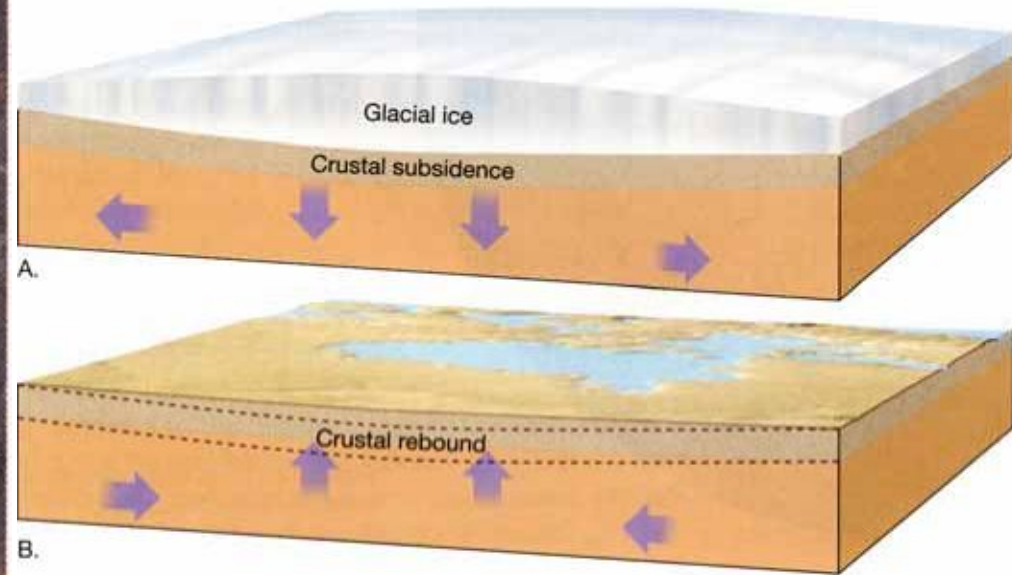
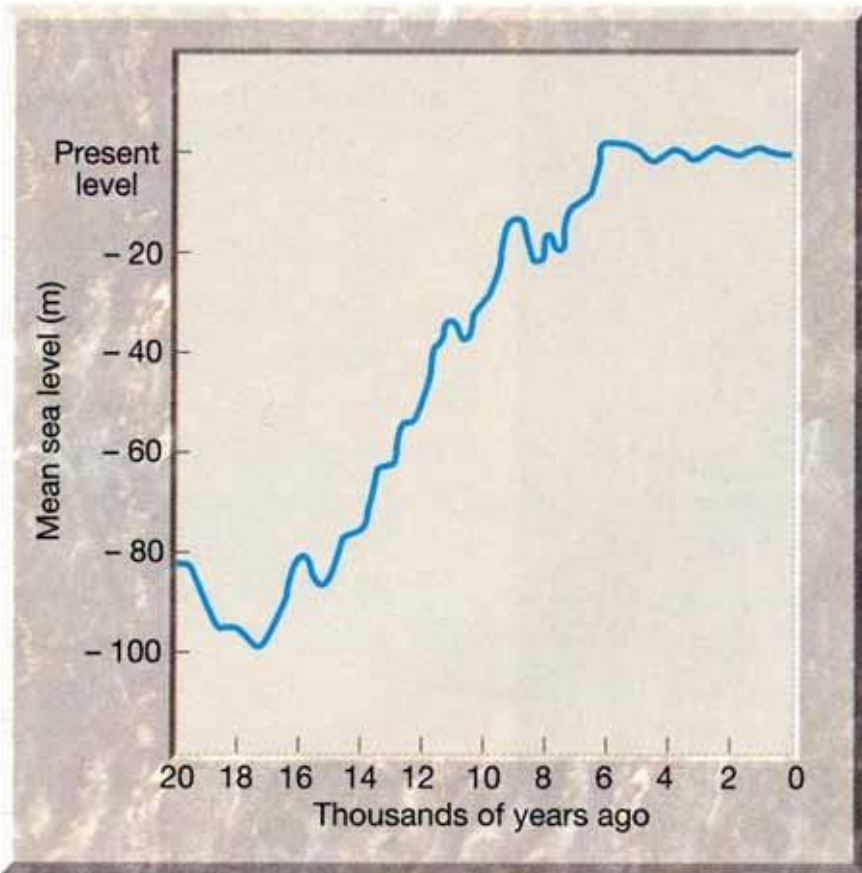
Четвертичный период

Modern World

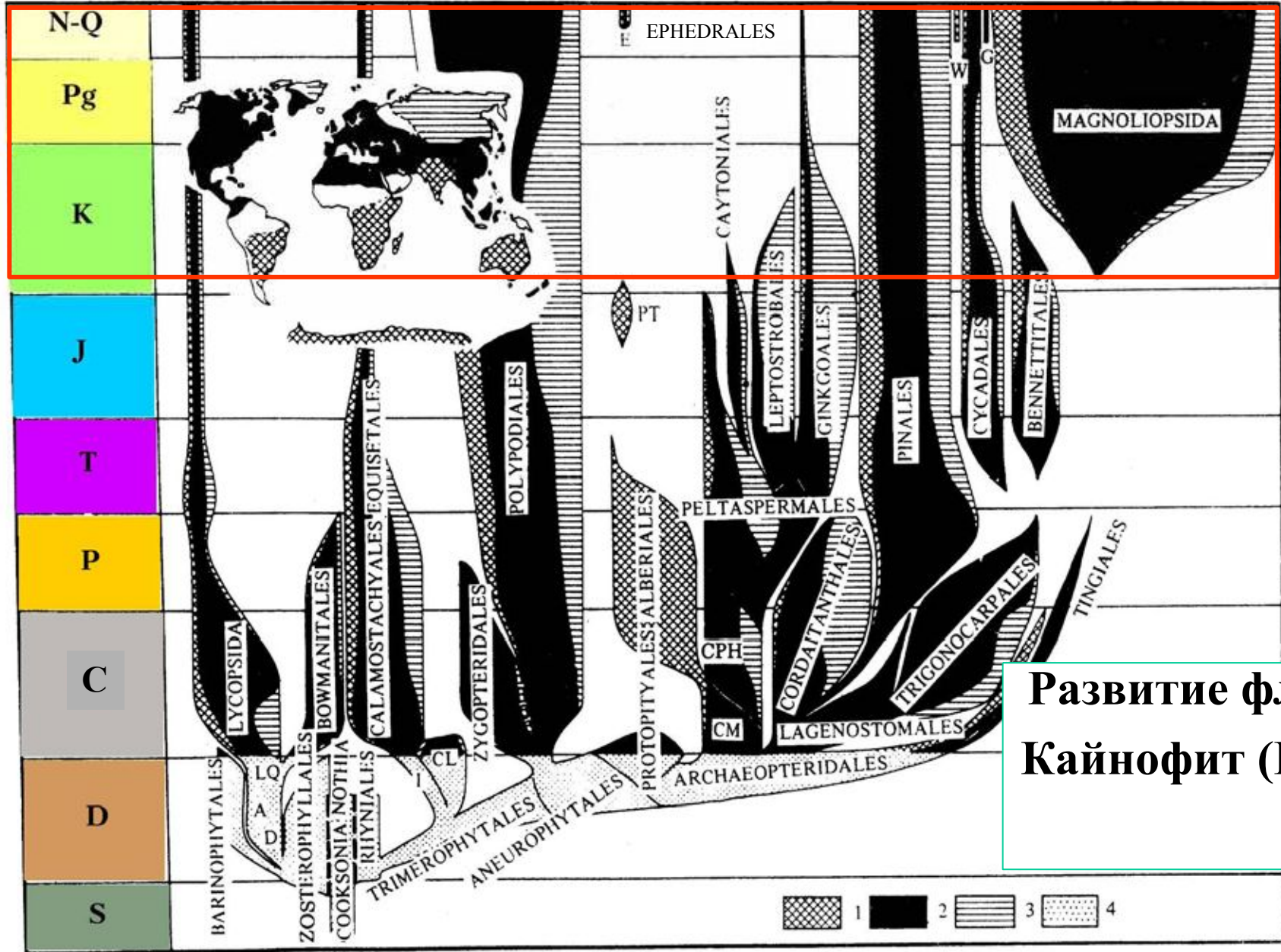


© 1995 C. R. Scotese, Paleogeography Press

Завершение оледенения

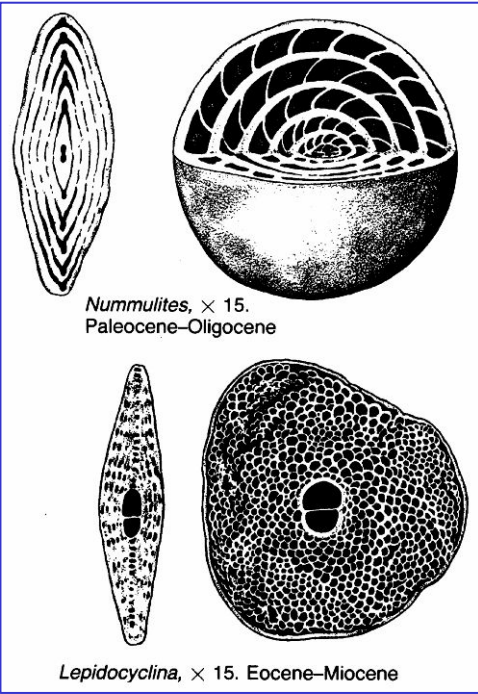


Развитие флоры в кайнозое



Развитие флоры
Кайнофит (K₁-Q)

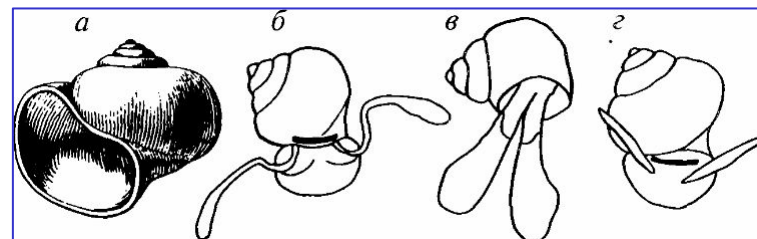
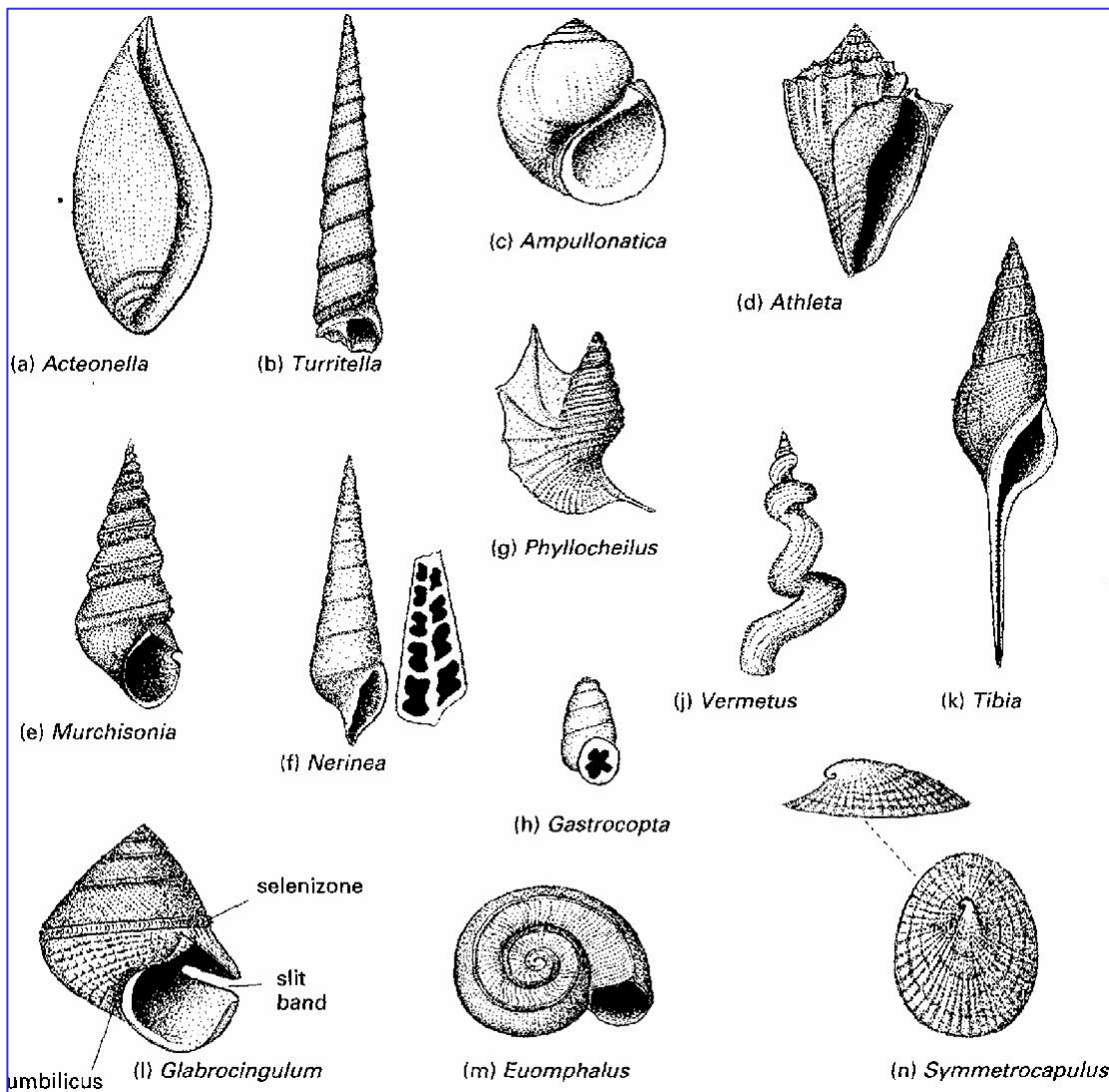
Развитие жизни в кайнозое



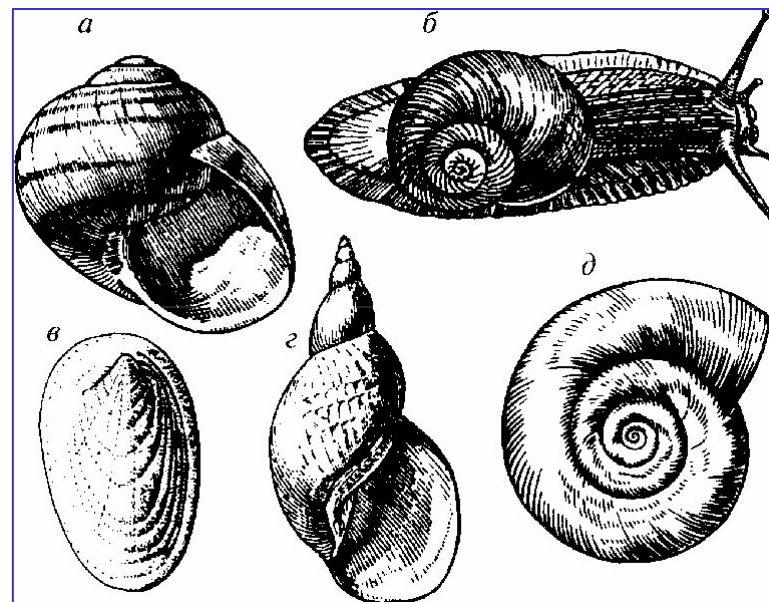
Фораминиферы - *Nummulites*



Развитие жизни в кайнозое. Гастроподы

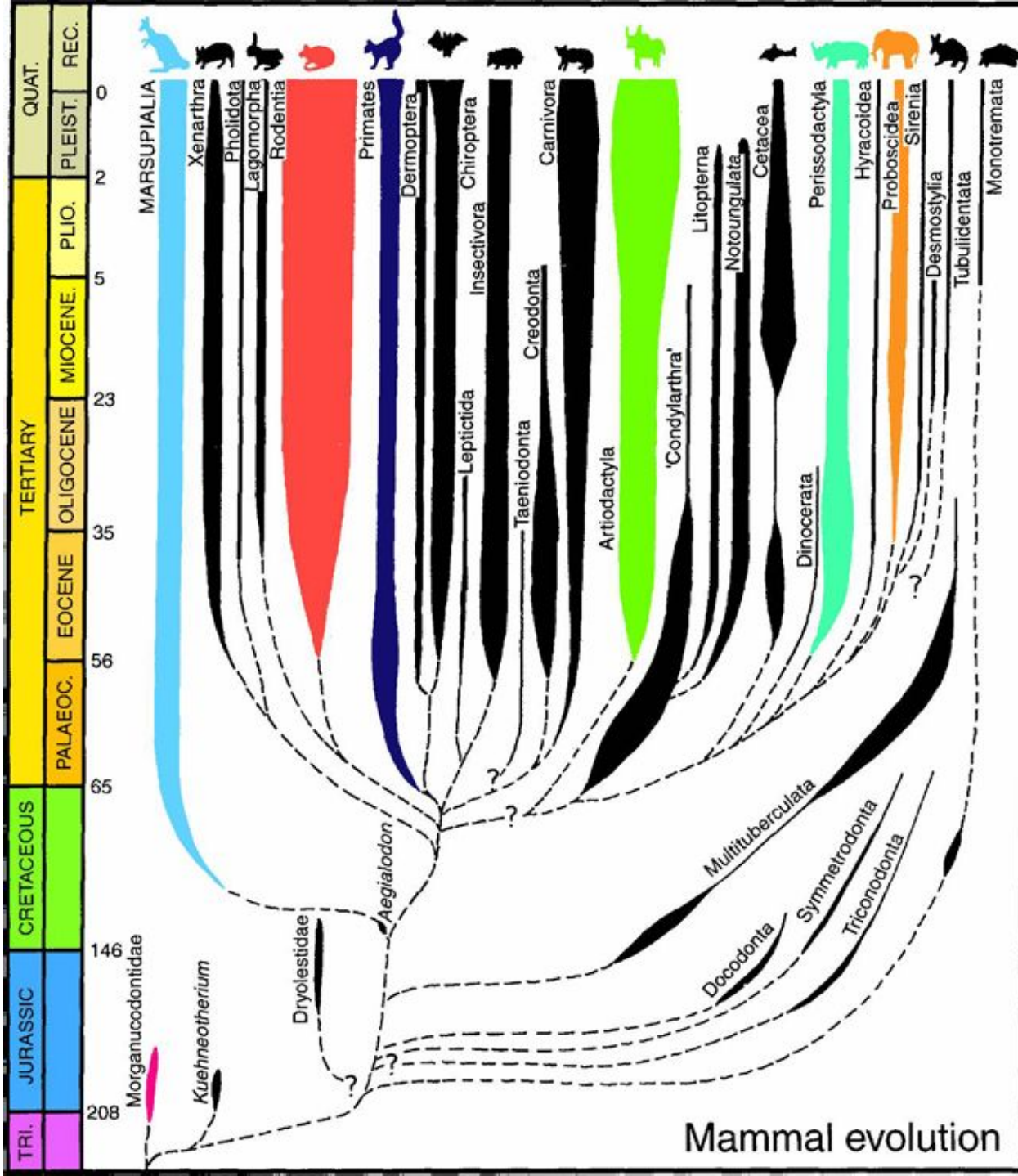


Отряд Pteropoda (Pг-Q)



Отряд Mesogastropoda (O-Q)

Подкласс Pulmonata (C-Q)

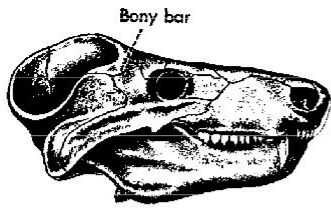


Развитие жизни в кайнозое

Млекопитающие

Mammal evolution

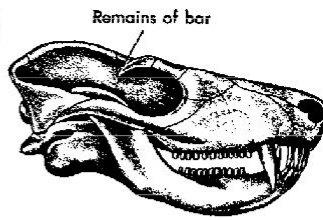
Развитие млекопитающих



Cynognathus, a typical Early Triassic carnivorous cynodont from South Africa, which had a broad bar of bone behind the eye. Length 30 centimeters (12 in.)



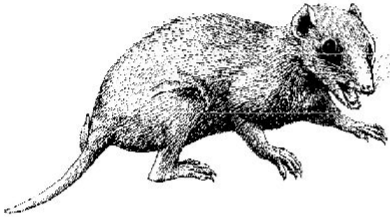
Bienotherium, a Late Triassic herbivorous cynodont from China, with no trace of a bar behind the eye. Length 13 centimeters (5 in.)



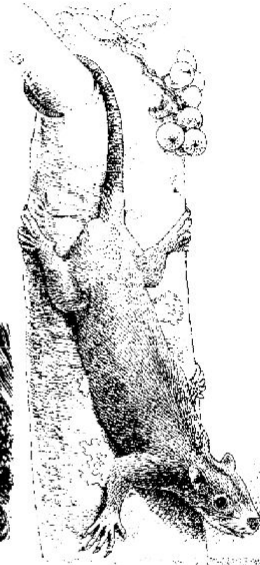
Bauria, an advanced Early Triassic therapsid that had lost part of the bar behind the eye. Length 5 inches (13 cm.)

Three therapsids with varying development of a bar of bone behind the eye

Megazostrodon, a Late Triassic triconodont from Lesotho, southern Africa. Length about 6 inches (15 cm.)



Ptilodus, a Paleocene multituberculata from North America. Length 12 inches (30 cm.)

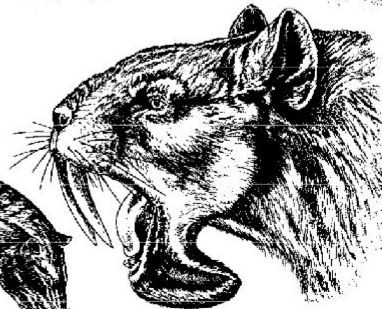


Asioryctes looked and probably lived like a modern shrew. Skull about 2 inches (5 cm.) long

The short-legged, wolf-like *Prothylacinus*. Body length about 4 feet (1.2 m.)



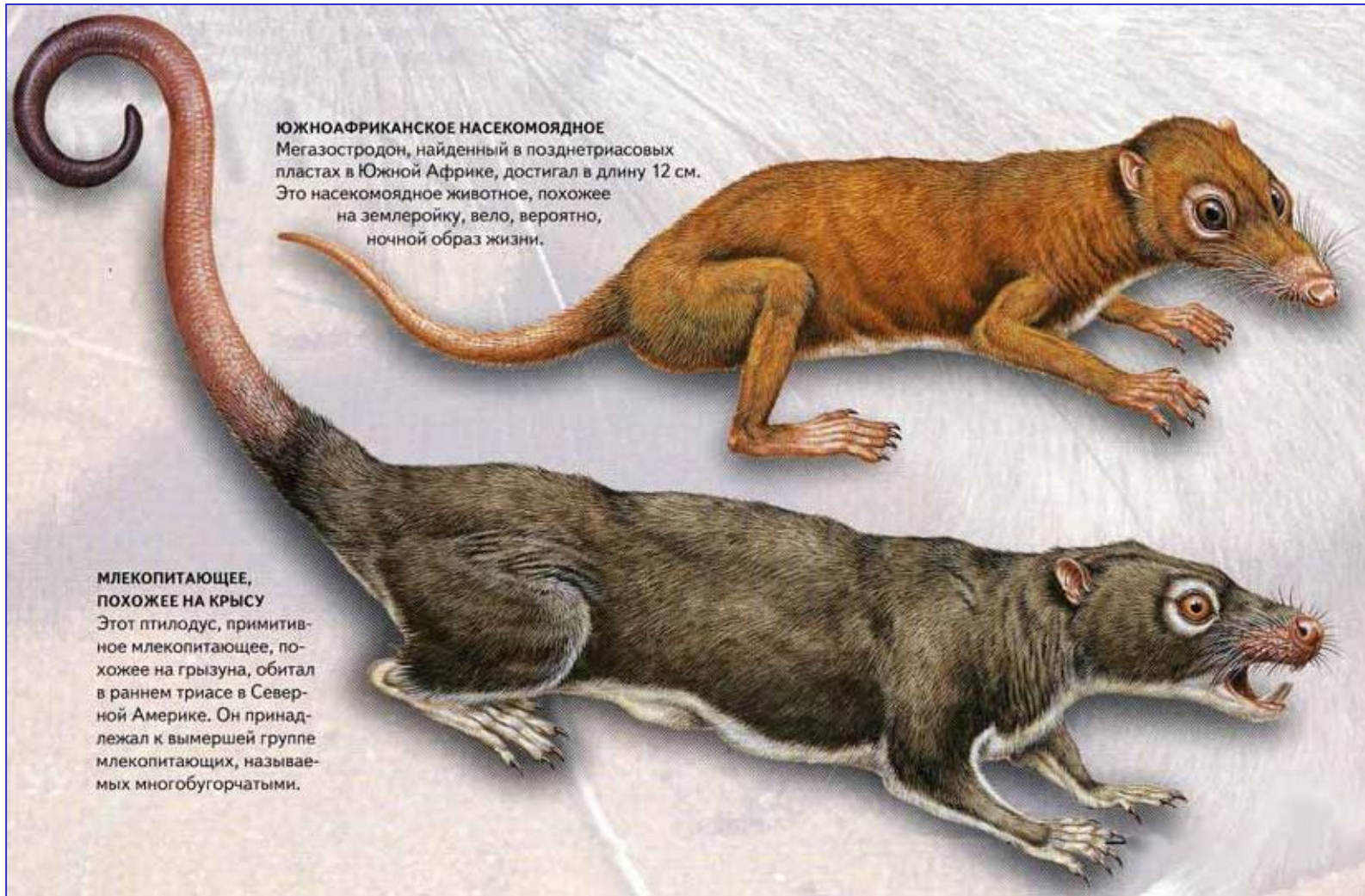
Two South American marsupials that resembled carnivores



Thylacosmilus was as large as a modern tiger but resembled the saber-toothed cats. Skull length 11 inches (27 cm.)

Циногнаты и ранние млекопитающие

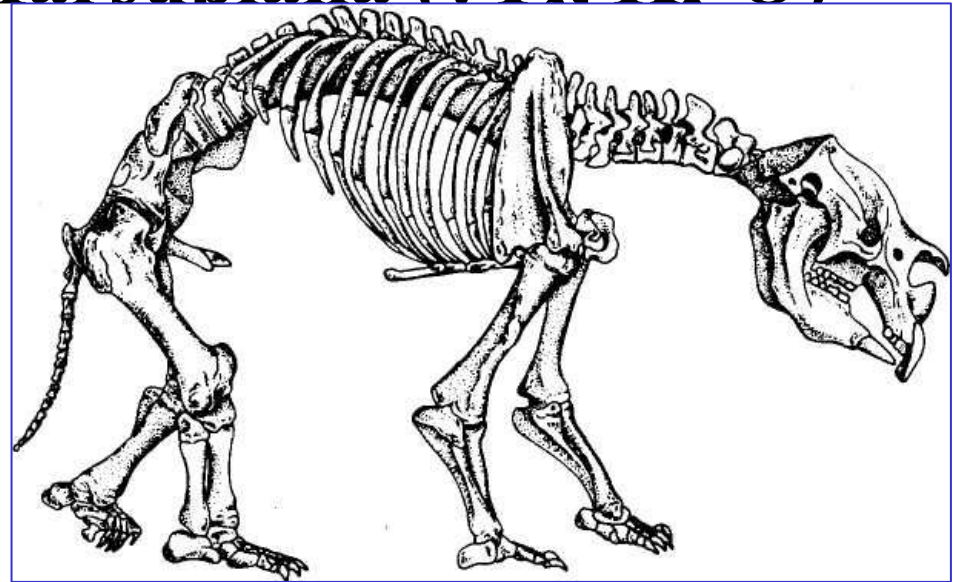
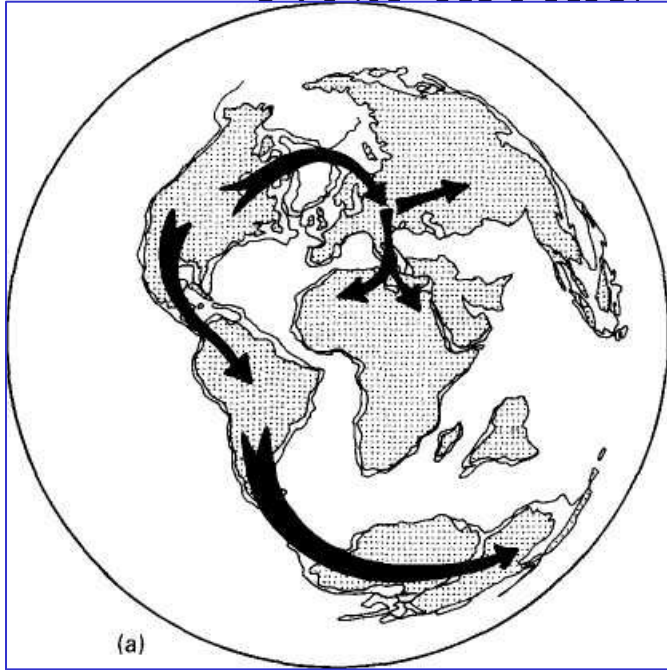
Развитие млекопитающих



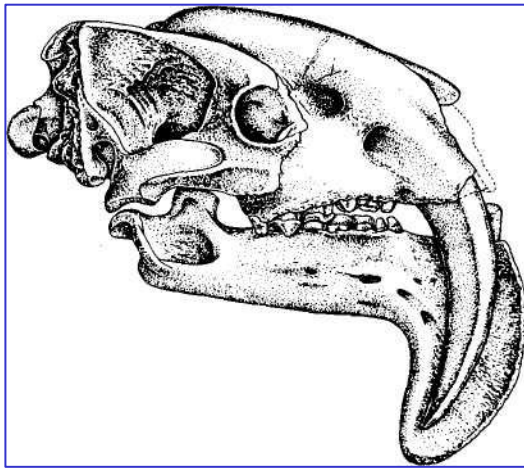
**Триасовые млекопитающие –
Megazostrodon (T₃), Ptilodus (T₁)**

Развитие млекопитающих.

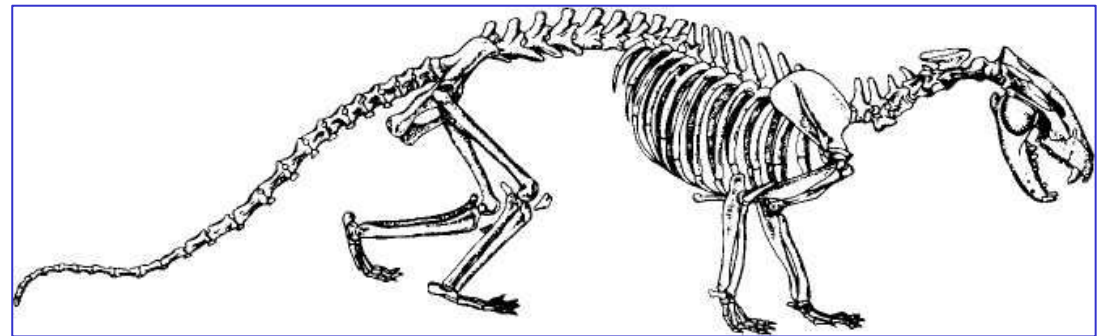
Сумчатые – Marsupialia (?Т., К.-О)



Diprotodon, N₁, Австралия

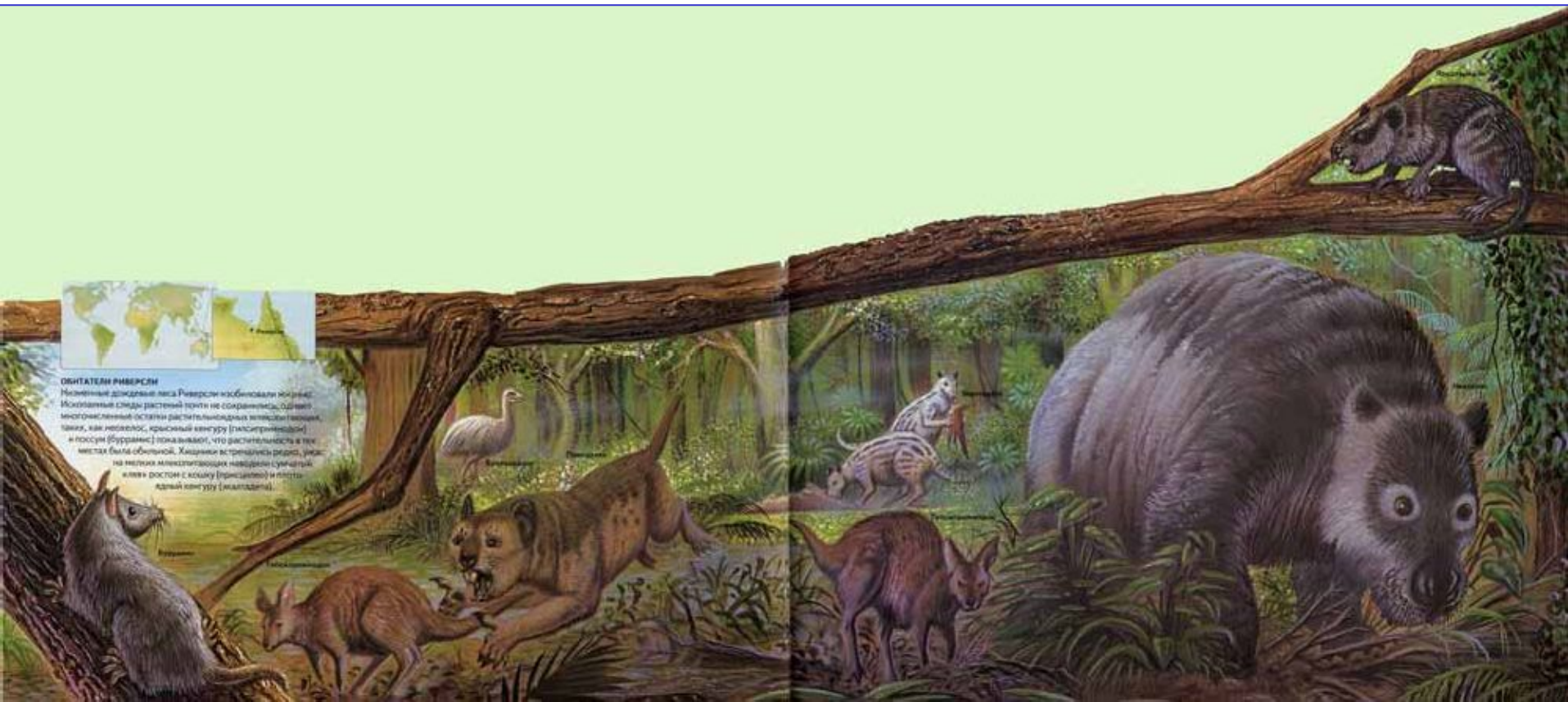


Thylacosmilus, N₁, Ю.Америка

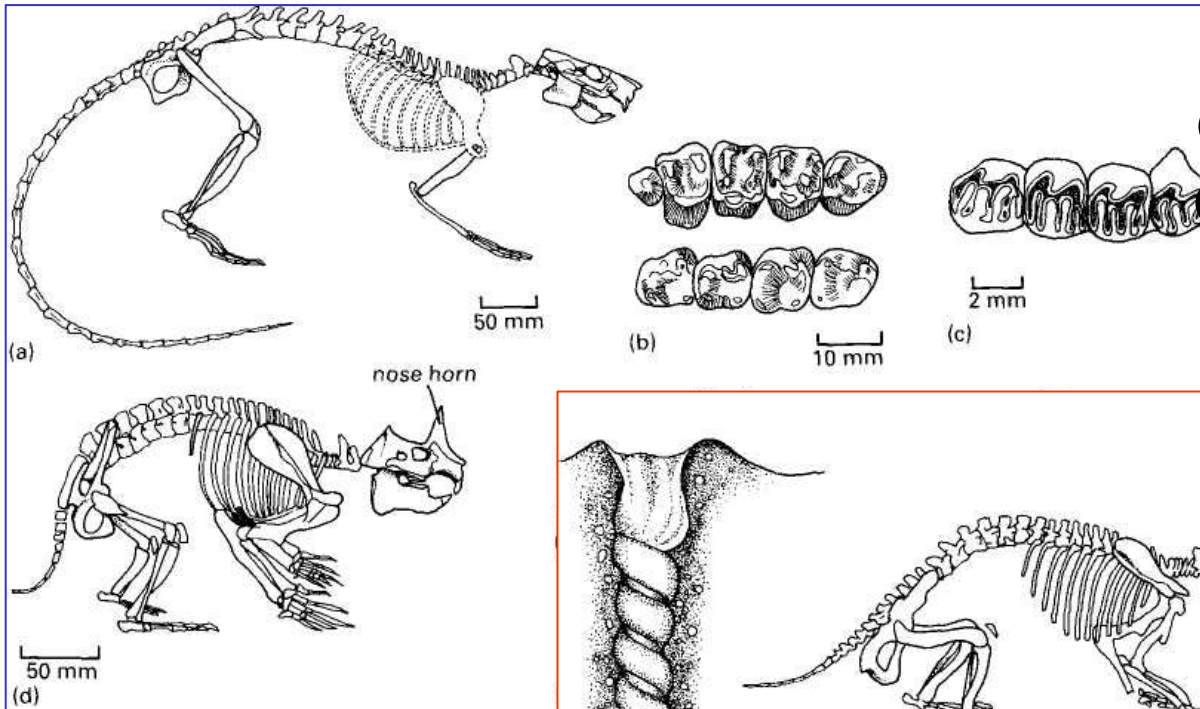


Prothylacynus, P_{g3}, Ю.Америка

Развитие млекопитающих. Сумчатые - Marsupialia

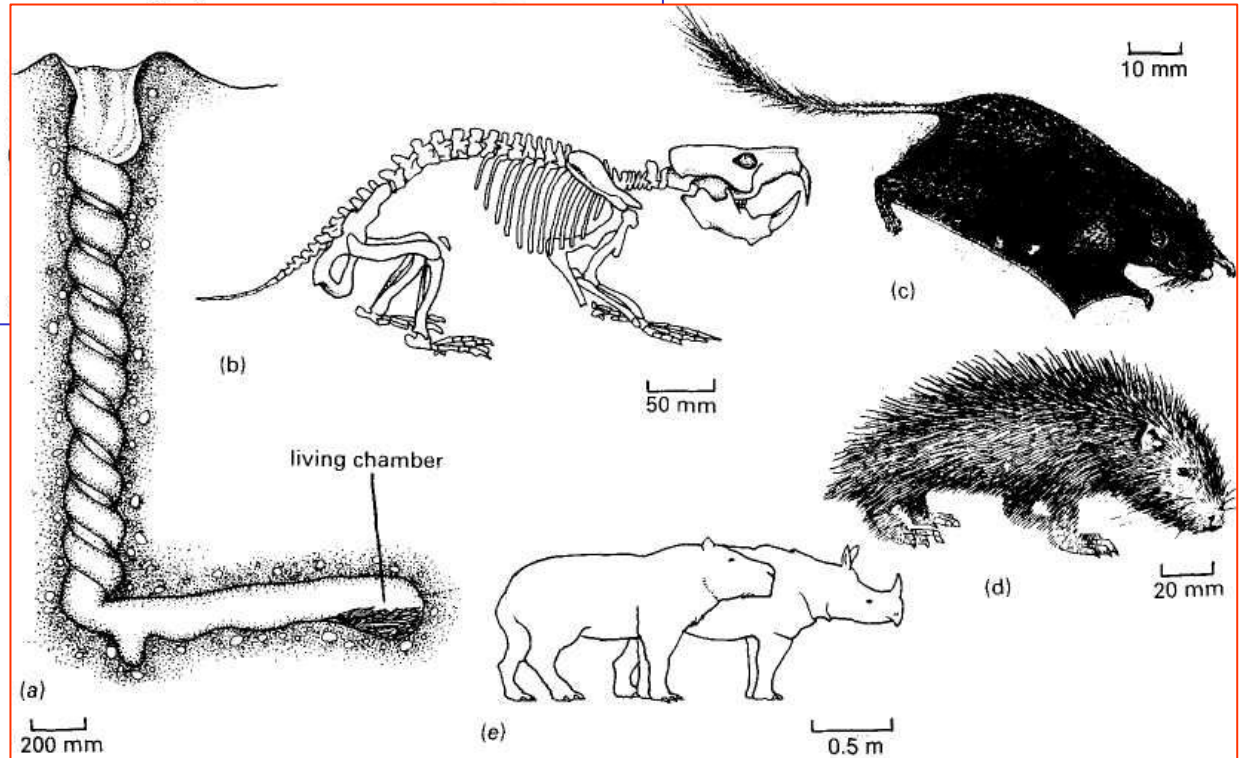


Развитие млекопитающих



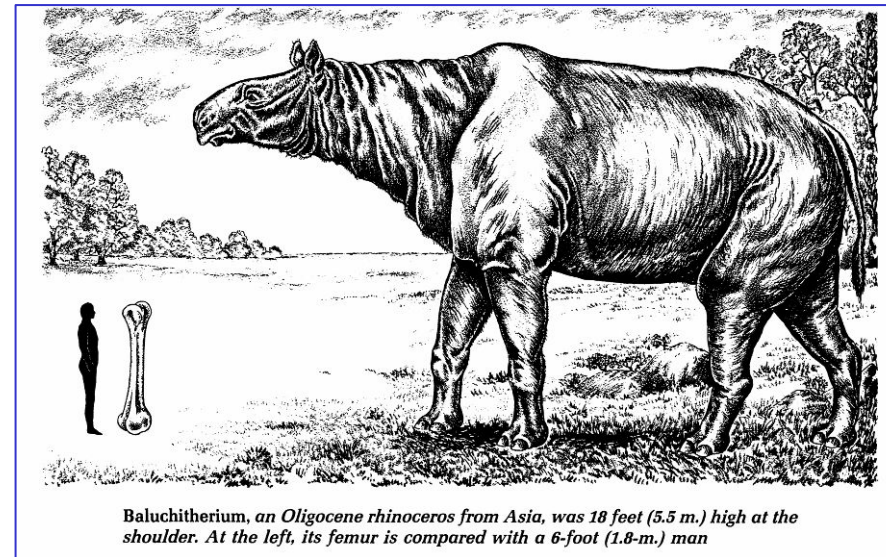
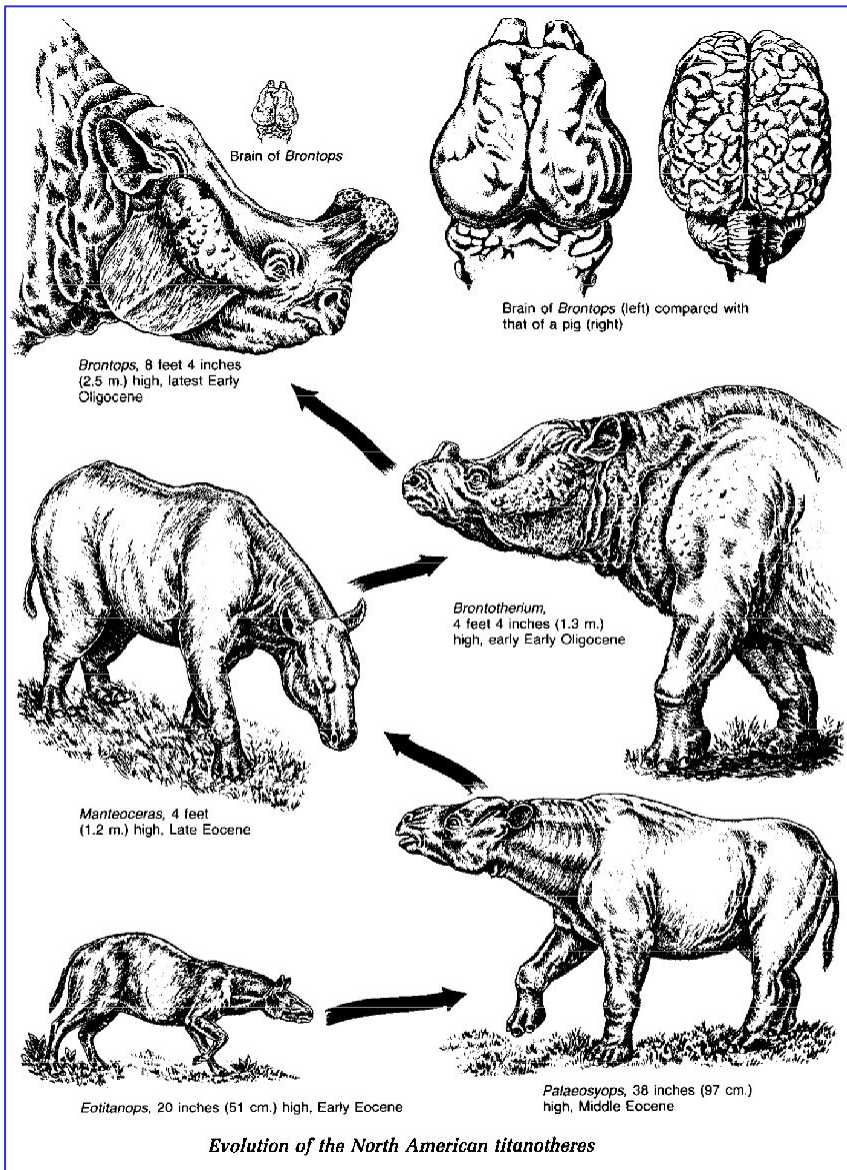
(a, b) *Paramys* (Pg₂);
 (c) *Theridomys* (Q);
 (d) *Epigaulus* (N₁)

(a, b) Нора *Daimonelix*
 от *Palaeocaster* (N₁);
 (c) *Eomys* (Pg₂);
 (d) *Sivacanthion* (N₁);
 (e) *Telicomys* (N₁)



Грызуны - *Rodentia* (Pg₁-Q)

Развитие млекопитающих

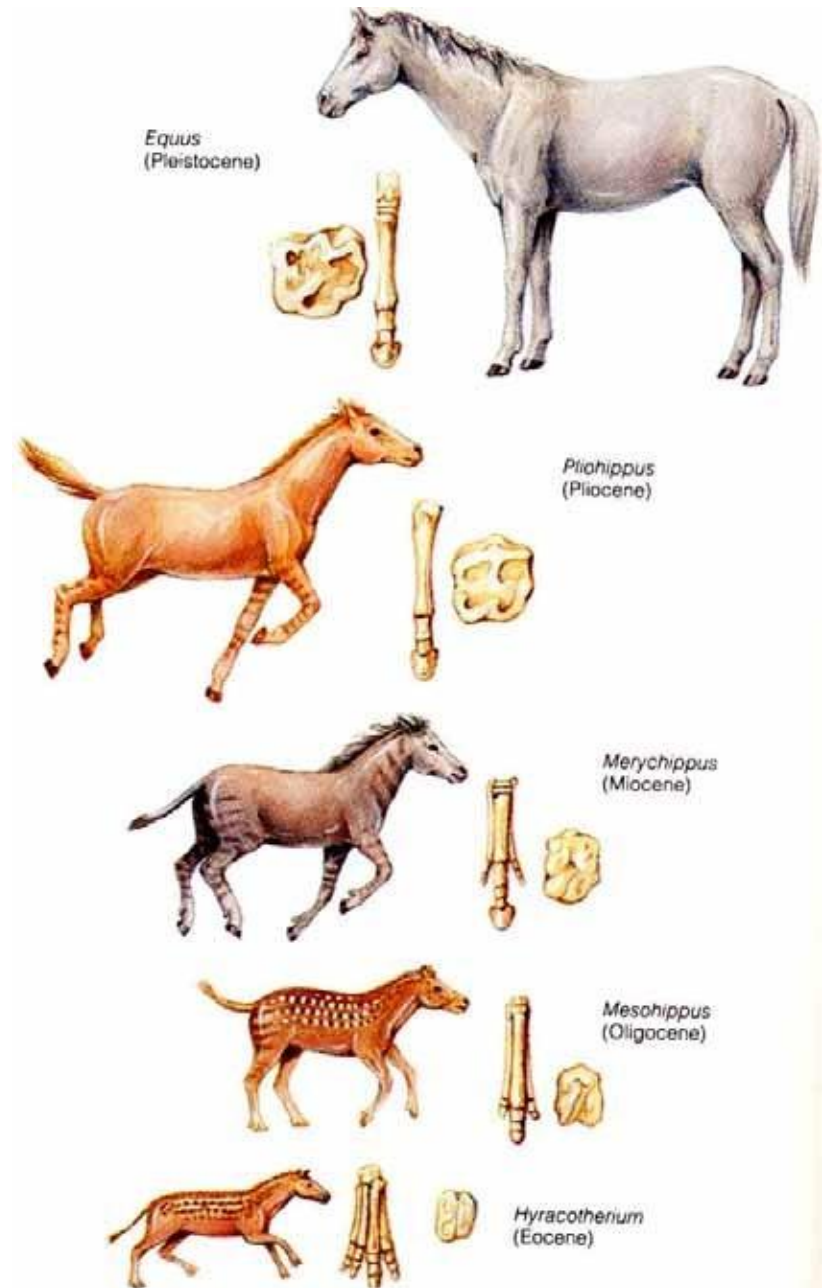
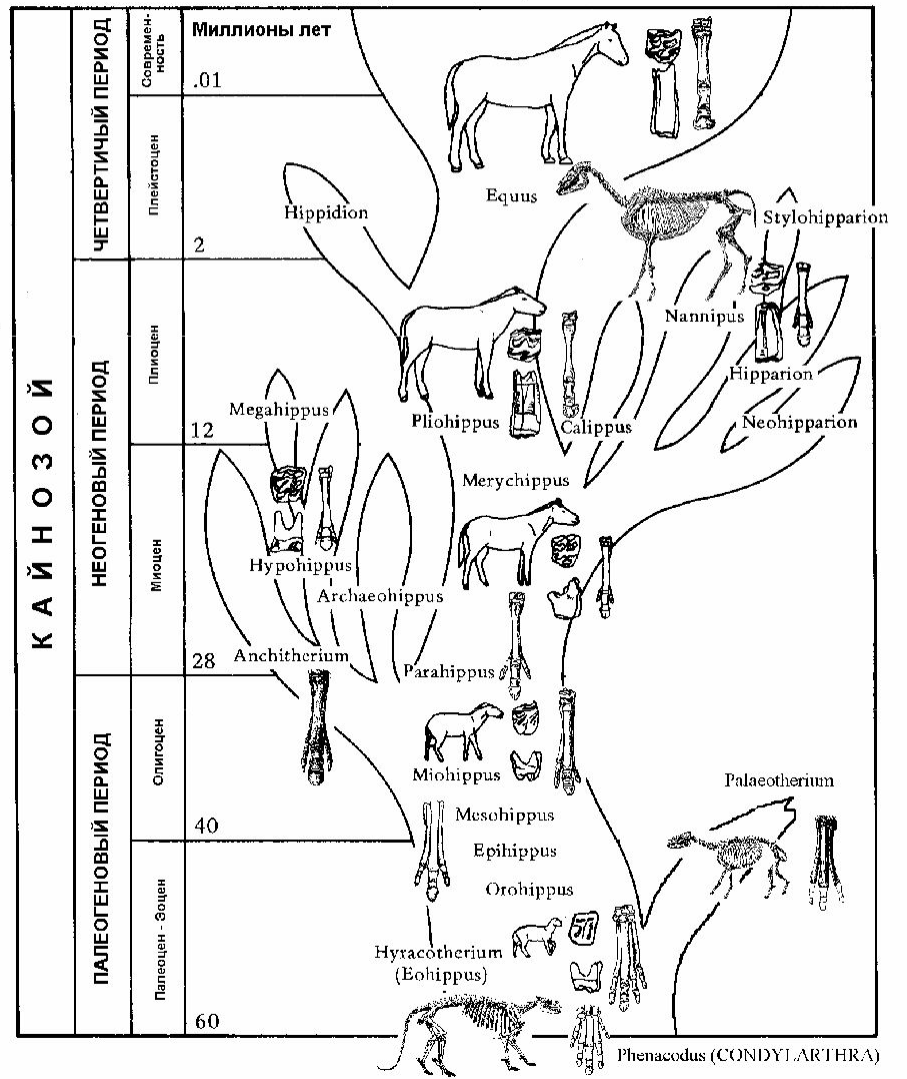


Непарнокопытные (Perissodactyla):

Rhinocerotoida и Brontotheroidea

Развитие млекопитающих

ЭВОЛЮЦИЯ EQUIDAE

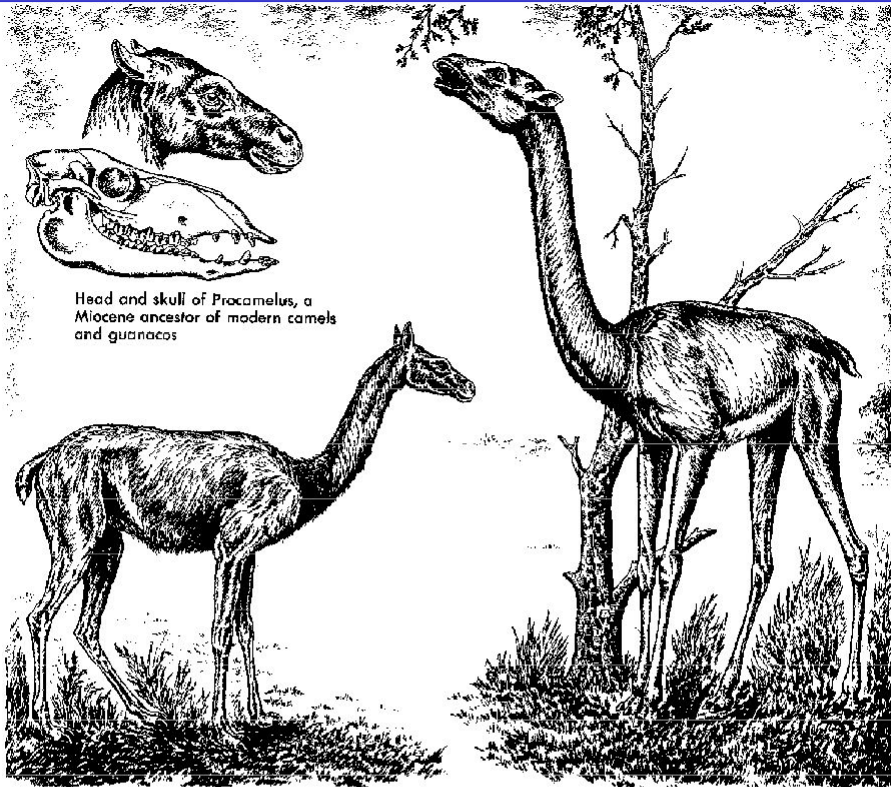


Непарнокопытные

(Perissodactyla). Лошадиные -

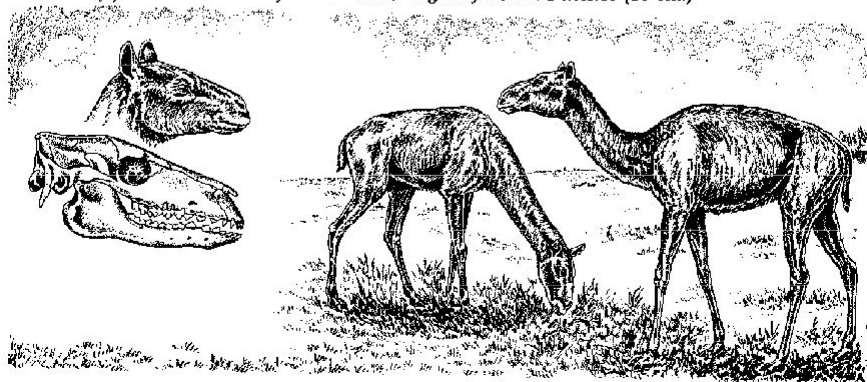
Equidae (Pg-Q)

Развитие млекопитающих



Head and skull of *Procamelus*, a Miocene ancestor of modern camels and guanacos

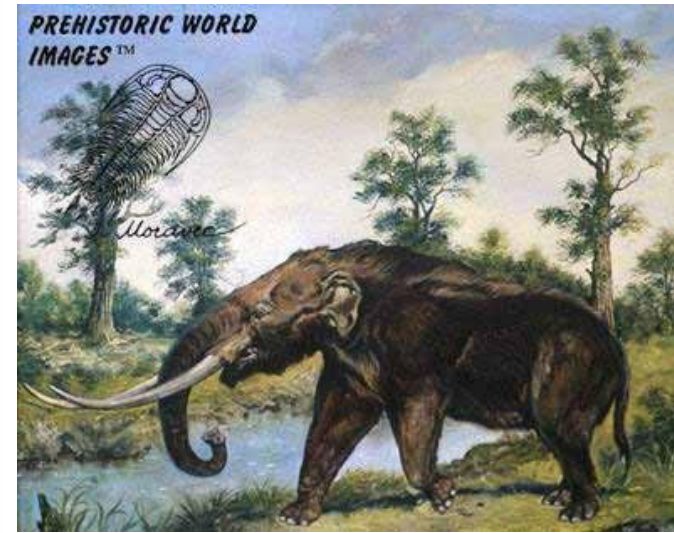
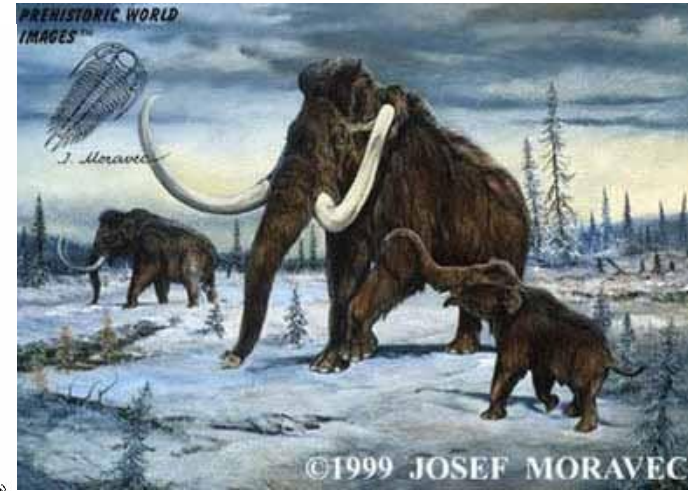
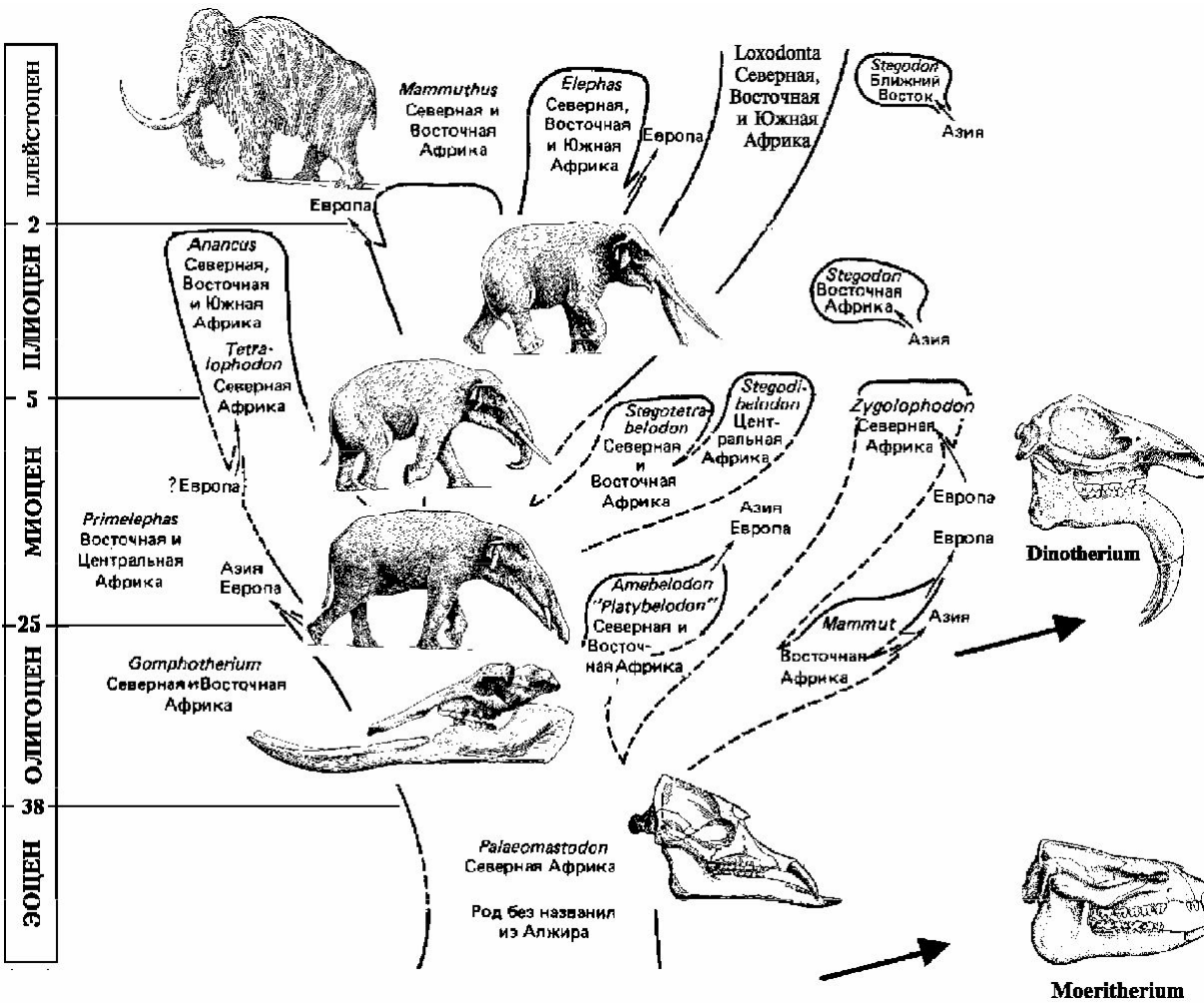
Three North American camels. (Left) *Oxydactylus*, a long-necked Miocene camel 4 feet 6 inches (137 cm.) at the shoulder. (Right) *Aepyamelus*, a Miocene beast with such long legs and neck that it has been nicknamed the "giraffe camel." (Top left) head and skull of *Procamelus*, length of skull 12 inches (30 cm.)



(Left) head of *Protylepus*, Late Eocene of North America, the oldest known member of the camel family; length of skull 4.7 inches (12 cm.). (Right) *Stenomylus*, an Early Miocene camel from North America, stood 27 inches (69 cm.) high at the

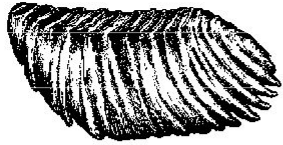
Парнокопытные
(Artiodactyla)
Верблюдовые –
Camelidae (N-Q)

Развитие млекопитающих

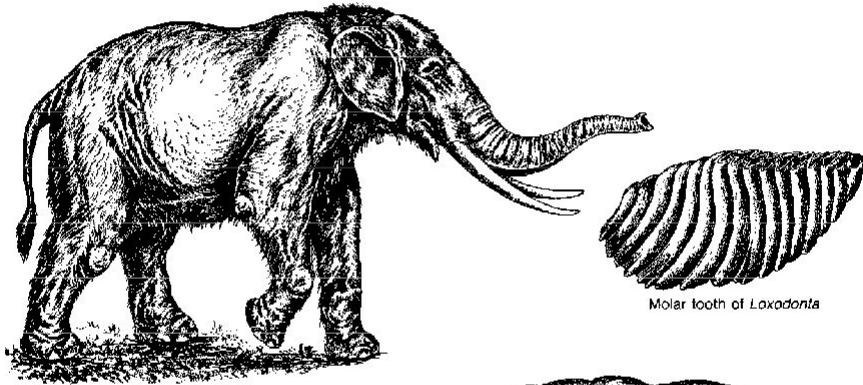
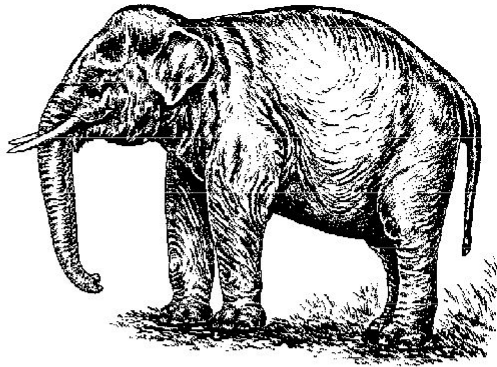


Хоботные – Proboscidea (Pg₂-Q)

Развитие млекопитающих



Elephas, the modern elephant of Asia, and one of its complex molar teeth; the tusks are relatively small. Height 8 to 10 feet (2.4–3.0 m.) at the shoulder

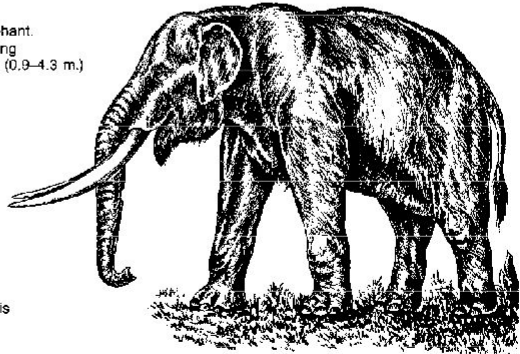


Molar tooth of *Loxodonta*

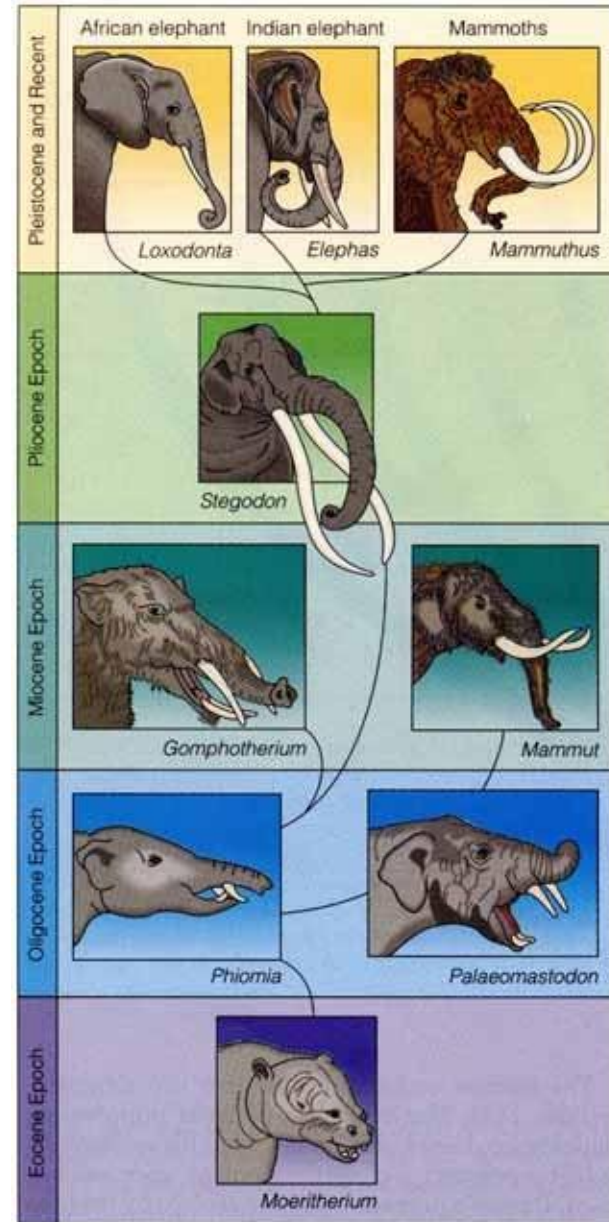
Loxodonta, the modern African elephant. This genus also lived in Europe during the Pleistocene. Height 9 to 14 feet (0.9–4.3 m.) at the shoulder



Stegodon and one of its molars. This very primitive elephant appeared in Asia during the Pliocene Epoch

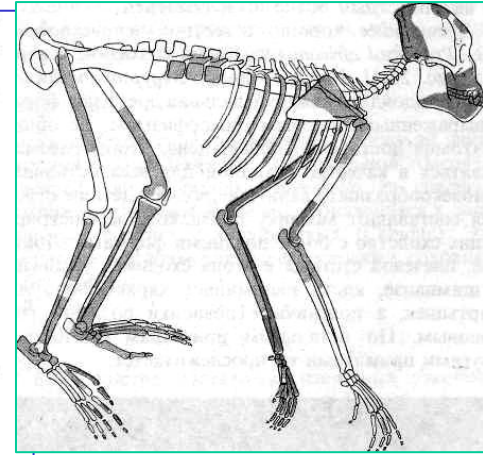
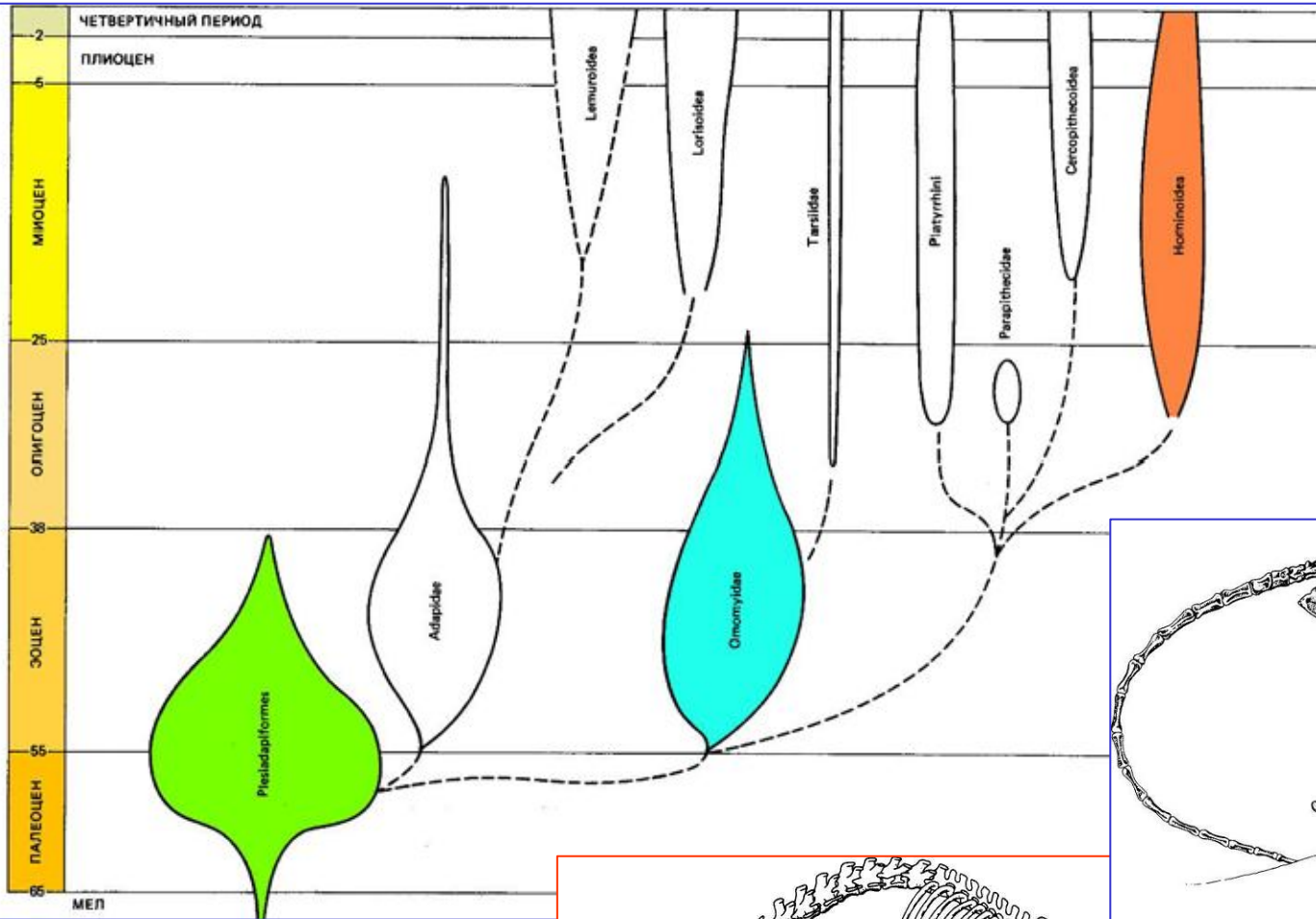


Three stages in the evolution of elephants, showing the increasing size and complexity of molar teeth and the reduction of tusks in the modern *Elephas*

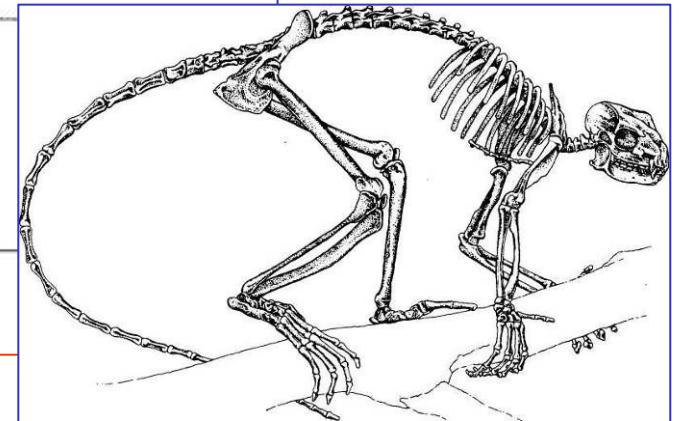


Хоботные – Proboscidea (Pg₂-Q)

Развитие млекопитающих



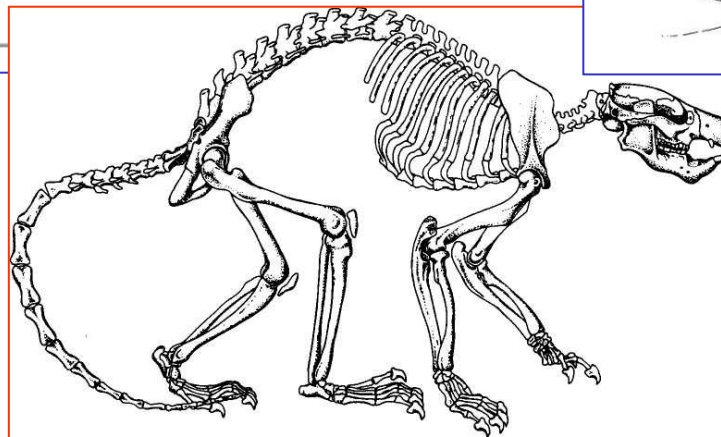
Proconsul (N₁)



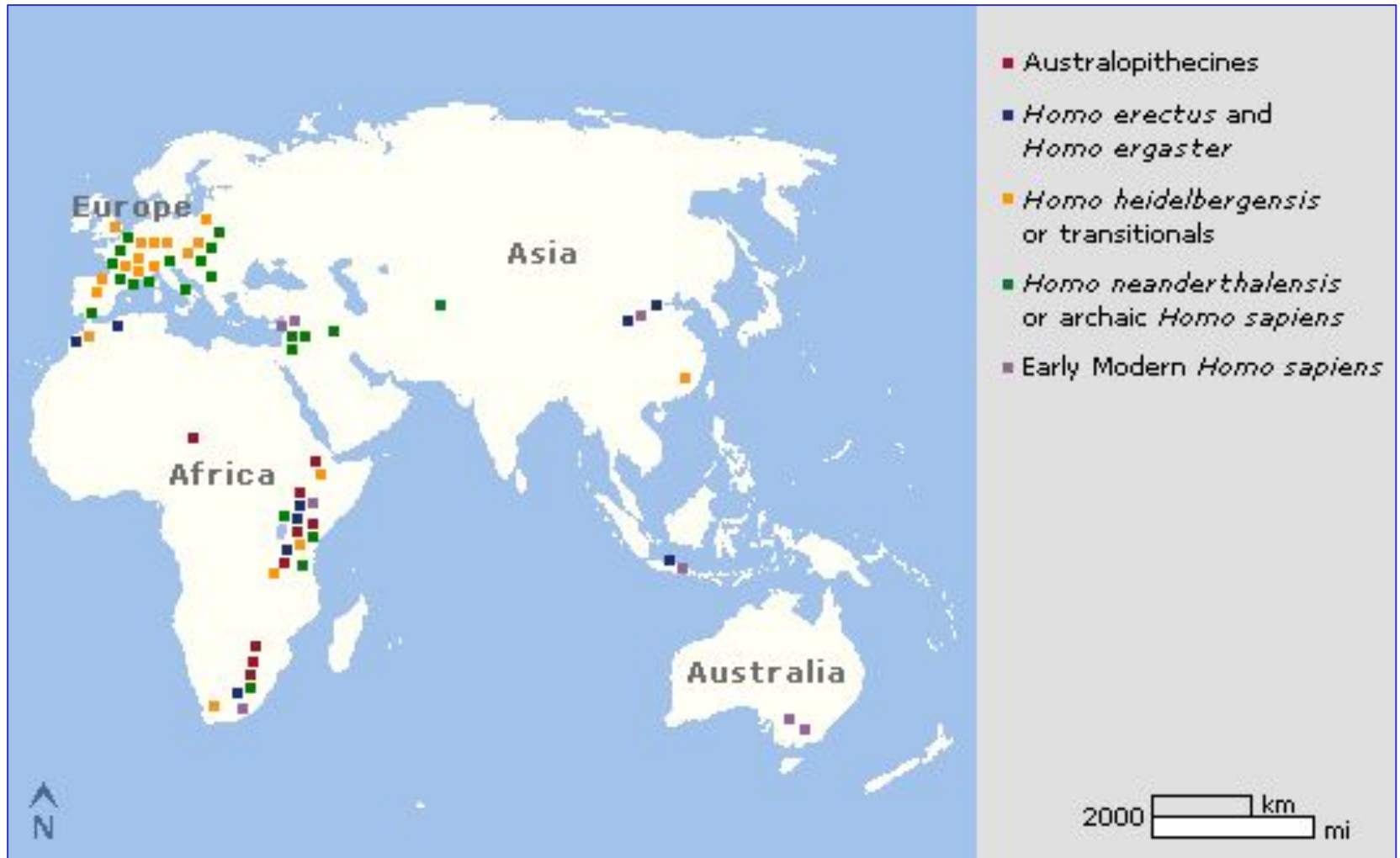
Smilodectes (Pg₂)

Приматы

Plesiadapis (Pg₁)

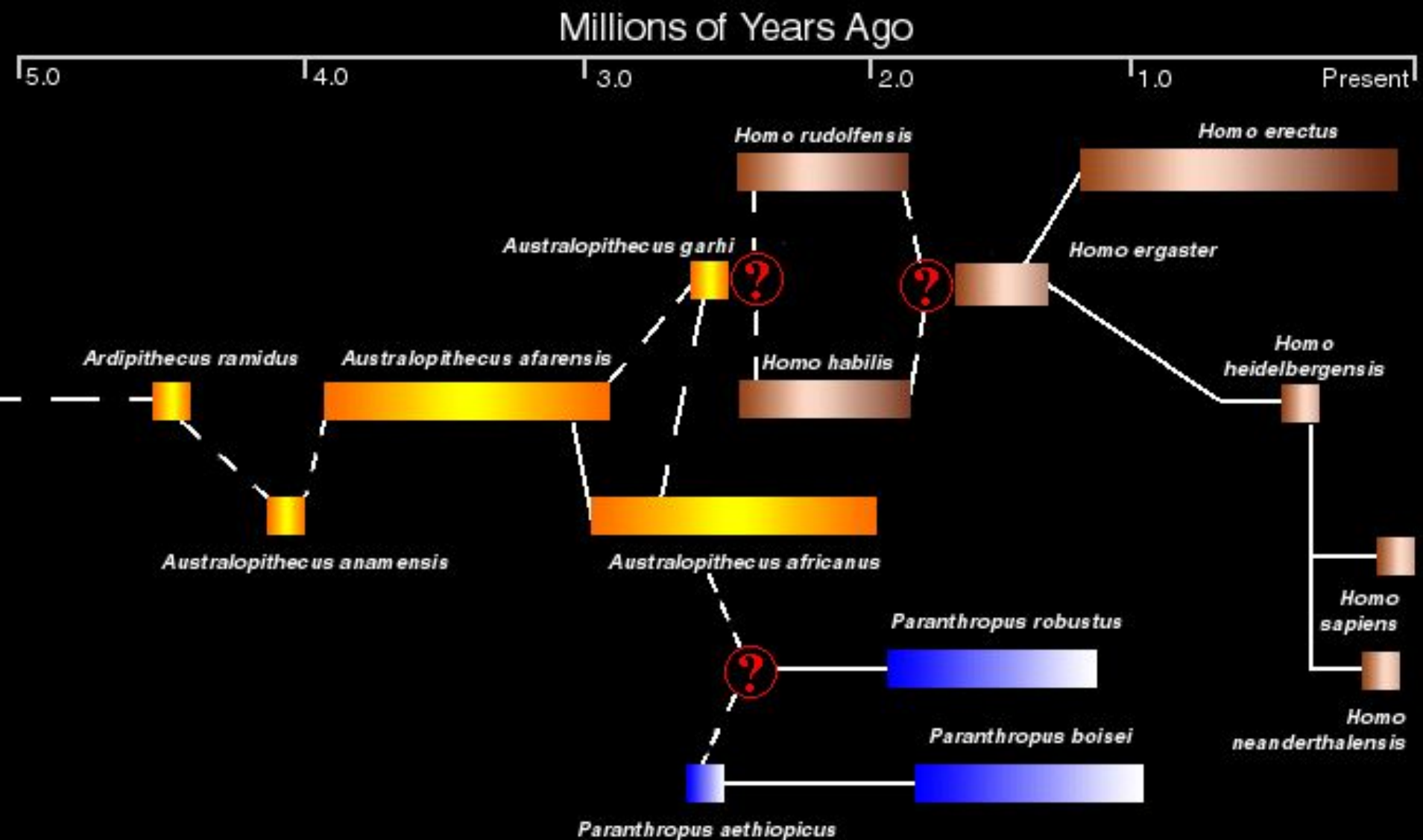


Происхождение человека



Находки древних гоминид

Развитие млекопитающих



Происхождение человека

Происхождение человека



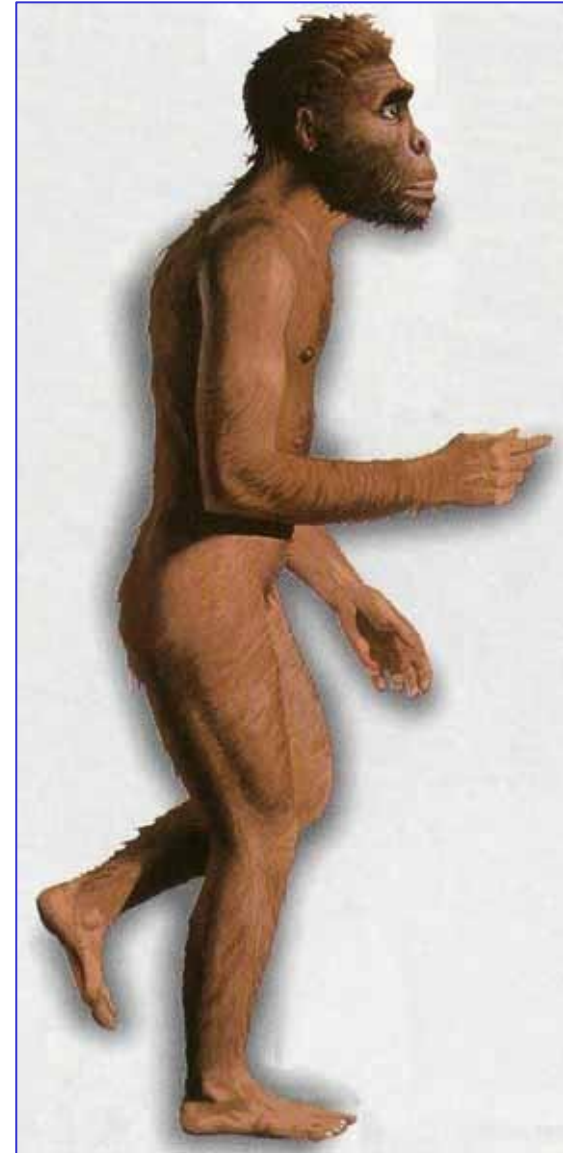
Australopithecus afarensis (4 - 3 млн. лет)

Происхождение человека



Paranthropus boisei (2.3 - 1.2 млн. лет)

Происхождение человека



Homo habilis (2.4 - 1.5 млн. лет)

Происхождение человека



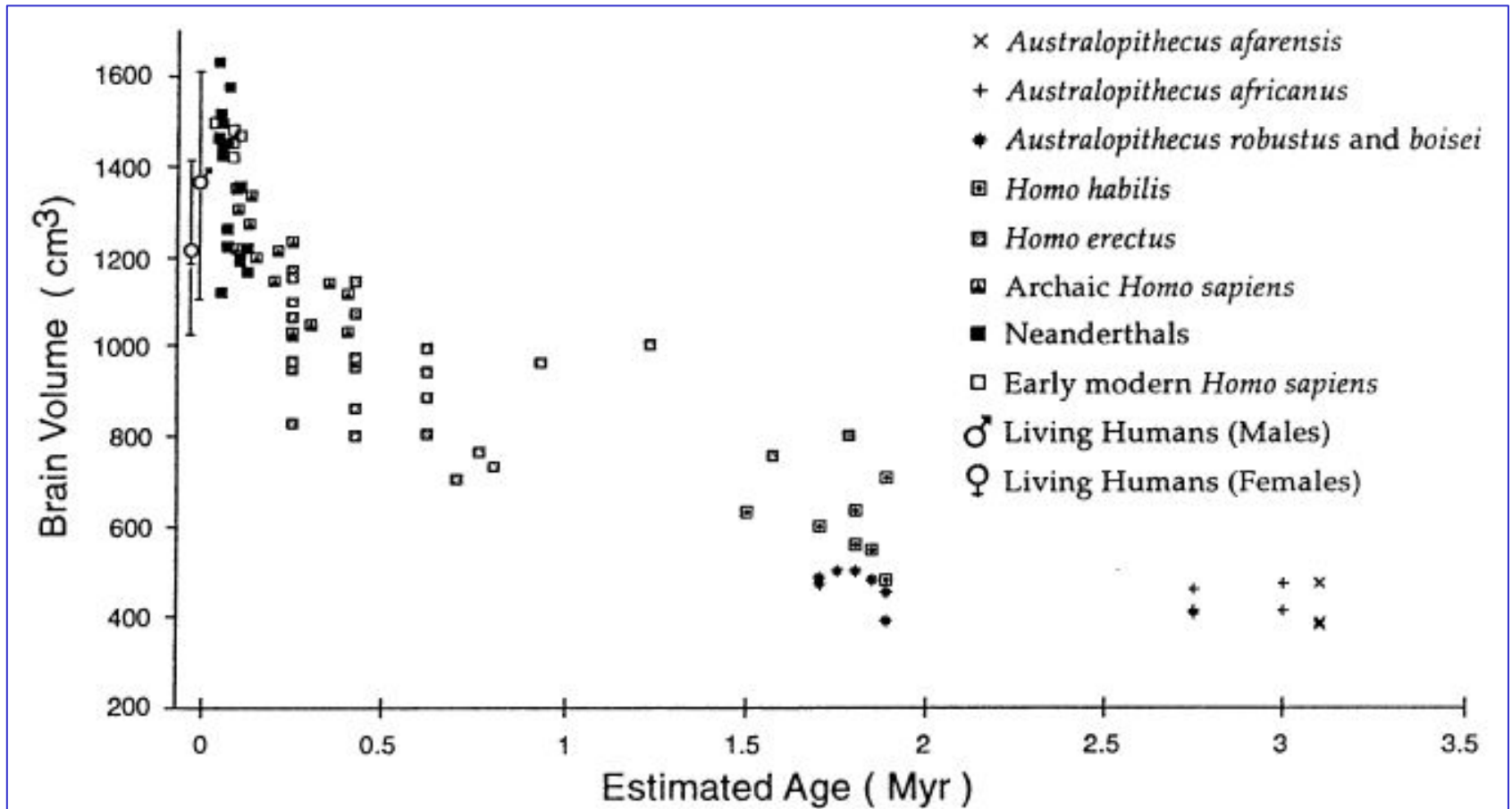
Homo heidelbergensis (0.5 млн. лет)

Происхождение человека



Homo neanderthalensis (230 – 30 тыс. лет)

Происхождение человека






Развитие головного мозга у гоминид

Прогноз: 50 млн лет

Future World + 50 Ma



Ancient Landmass 
Modern Landmass 
Subduction Zone (triangles point in the direction of subduction) 
Sea Floor Spreading Ridge 

Прогноз: 150 млн

Future World + 150 Ma



Ancient Landmass

Modern Landmass

Subduction Zone (triangles point in the direction of subduction)

Sea Floor Spreading Ridge

Прогноз: 250 млн лет

Future World + 250 Ma



- Ancient Landmass 
- Modern Landmass 
- Subduction Zone (triangles point in the direction of subduction) 
- Sea Floor Spreading Ridge 