PALEOBIOGEOGRAFÍA

Todos los organismos tienen un rango geográfico.

La Paleobiogeografía es el estudio de los patrones de organización espacial de la diversidad biológica y de los procesos que han generado y mantenido dichos patrones en el pasado

UNIDADES BIOGEOGRÁFICAS

REINOS: basados en Ordenes, Familias
control climático, latitudinal

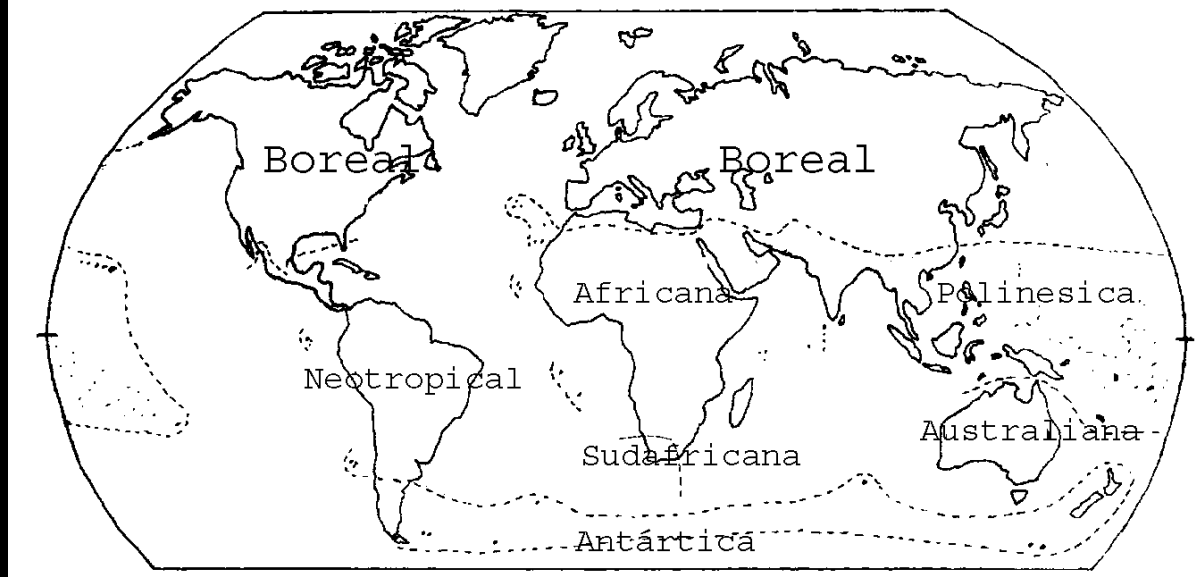
REGIONES: Familias, Géneros
control por barreras importantes

PROVINCIAS: Géneros y especies.
factores limitantes

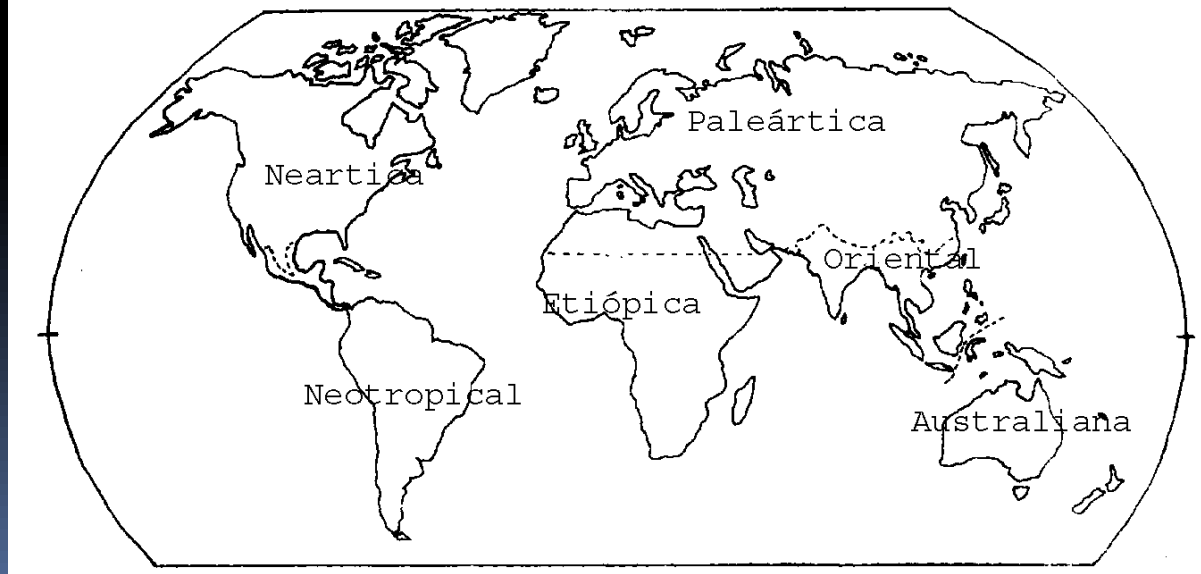
PALEOPROVINCIAS: en general géneros.

REGIONES BIOGEOGRAFICAS

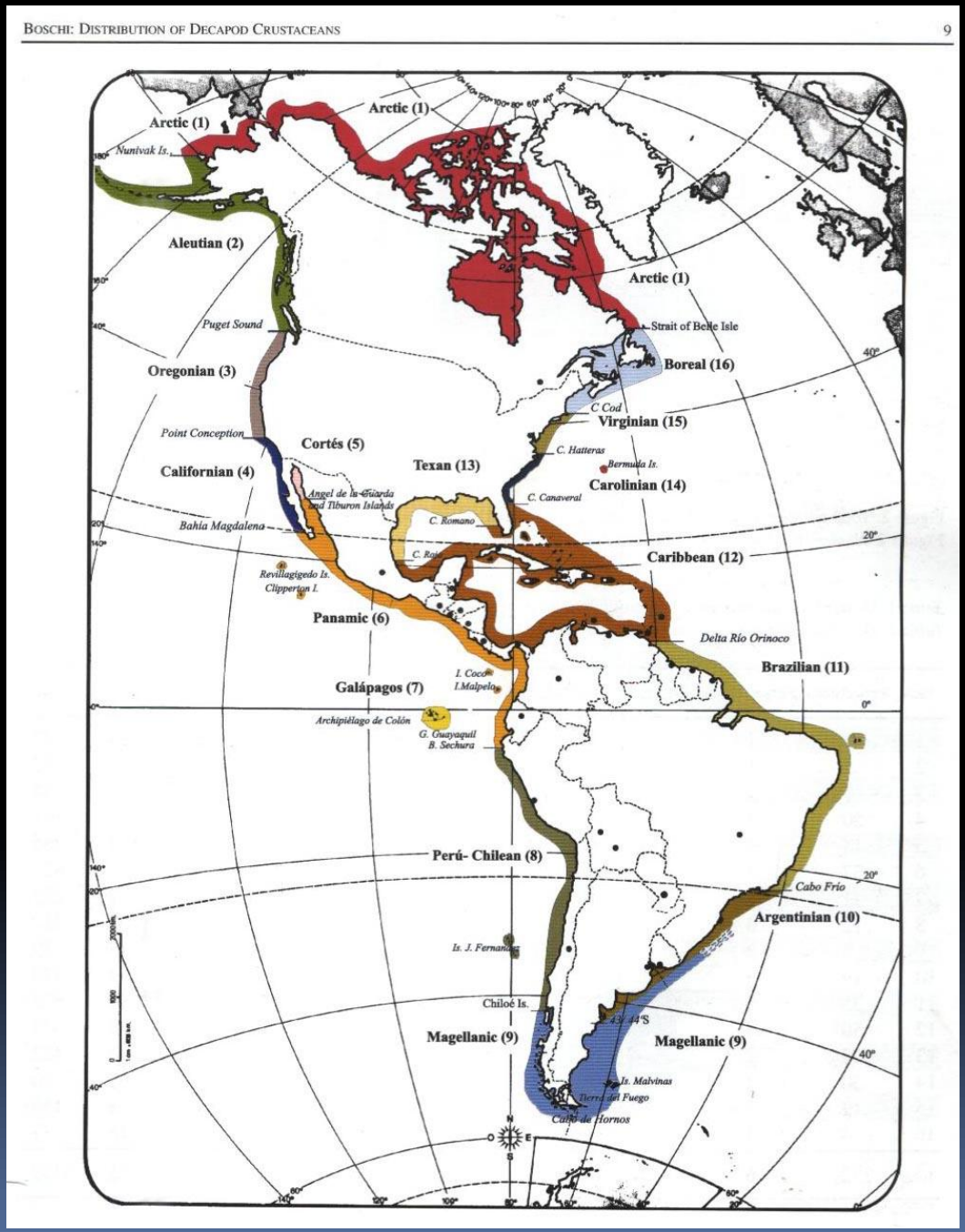
Fitogeográficas



Zoogeográficas



Provincias

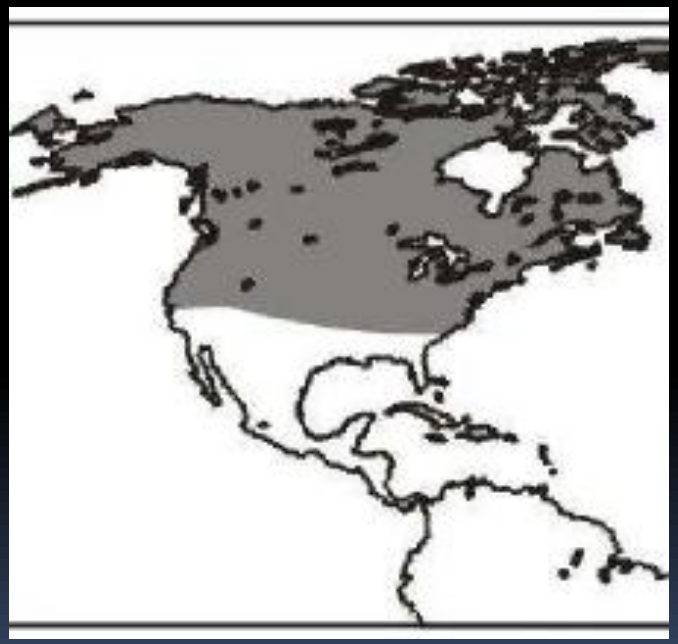

BOSCHI: DISTRIBUTION OF DECAPOD CRUSTACEANS 9
Arctic (1)
Arctic (1)
Nunivak Is.
Aleutian (2)
Arctic (1)
Puget Sound
Strait of Belle Isle
Oregonian (3)
Boreal (16)
C Cod
Virginian (15)
Point Conception
Cortés (5)
C. Hatteras
Texan (13)
Bermuda Is.
Californian (4)
Carolinian (14)
Angel de la Guarda and Tiburon Islands
C. Canaveral
C. Romano
Bahía Magdalena
Caribbean (12)
Revillagigedo Is.
Clipperton I.
Panamic (6)
Delta Río Orinoco
Brazilian (11)
I. Coco
I.Malpelo
Galápagos (7)
Archipiélago de Colón
G. Guayaquil
B. Sechura
Perú- Chilean (8)
Cabo Frío
Argentinian (10)
Is. J. Fernandez
Chiloé Is.
Magellanic (9)
Magellanic (9)
Is. Malvinas
Tierra del Fuego
Cabo de Hornos

PATRONES de distribución

- Distribución continua
- Discontinua
- Distribución disyunta
- Reliquia

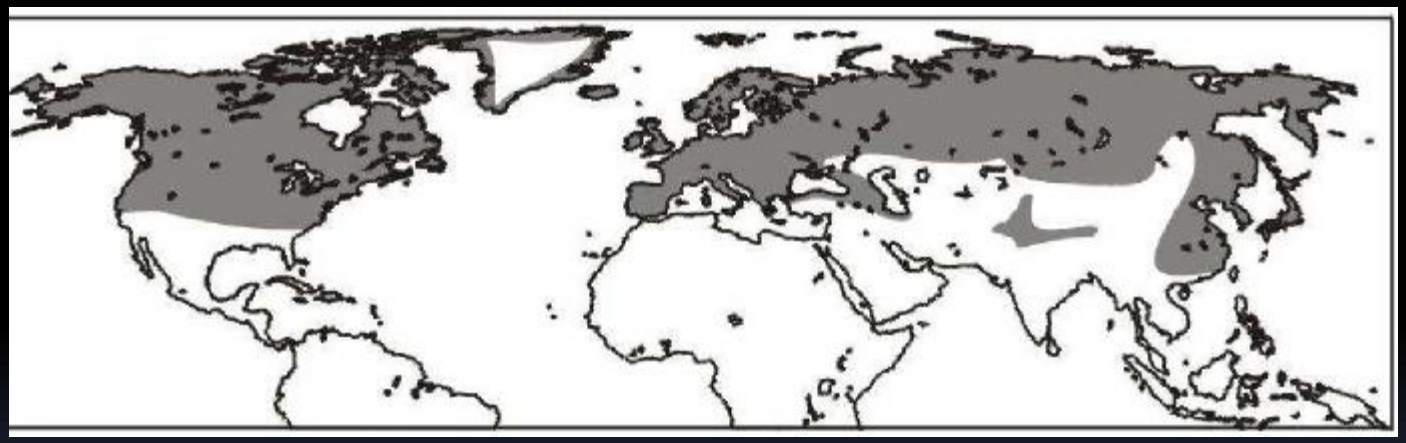
- Distribución continua

Equisetum arvense

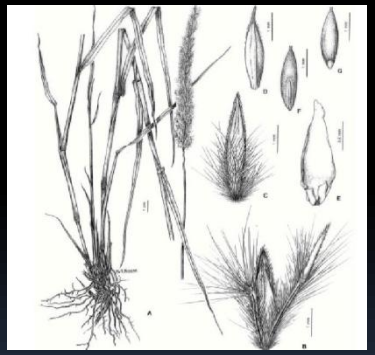


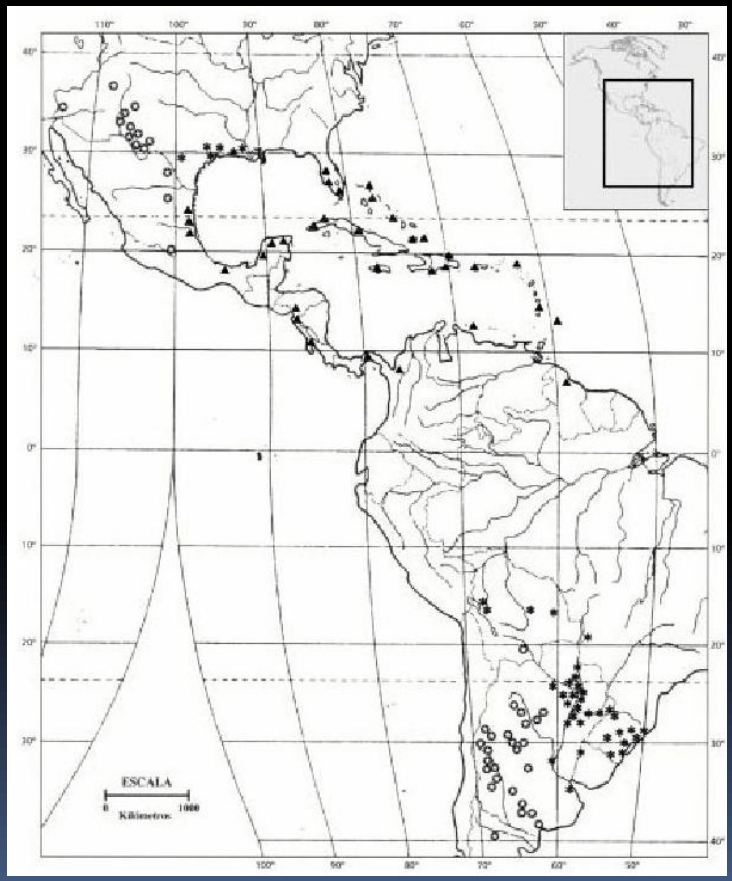
- Distribución discontinua

Equisetum arvense



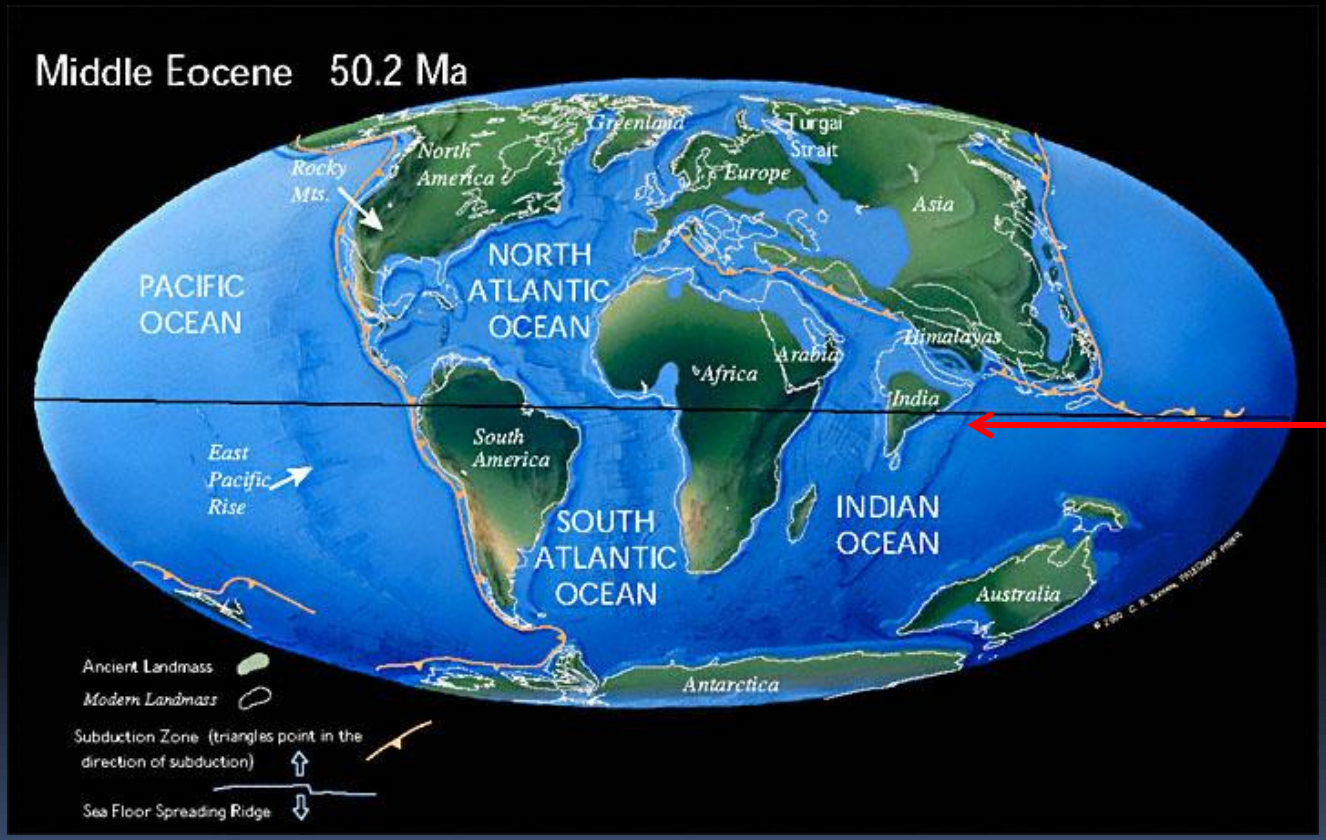
Distribución disyunta



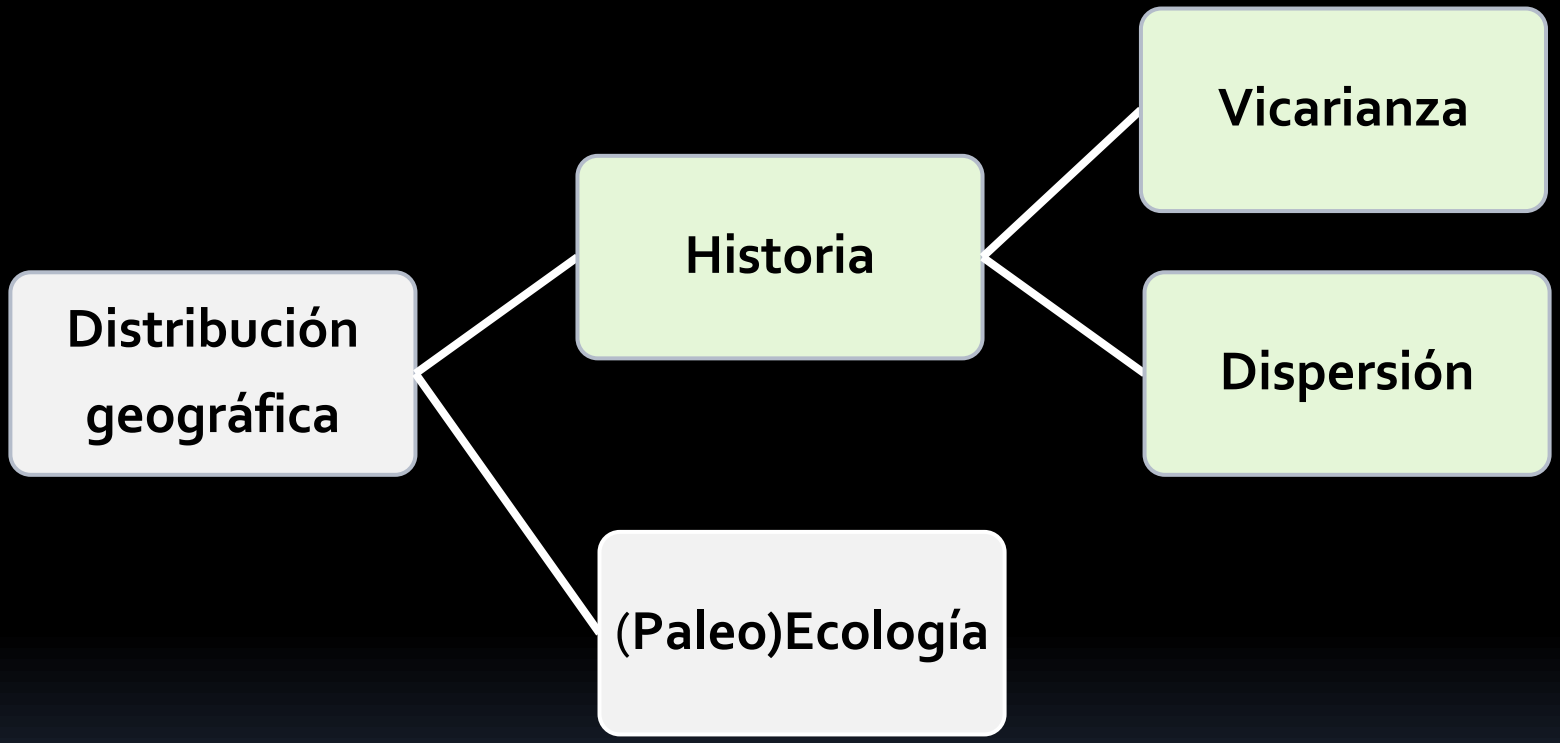


Reliquia

Barco Funerario Vikingo o Desplazamiento tectónico

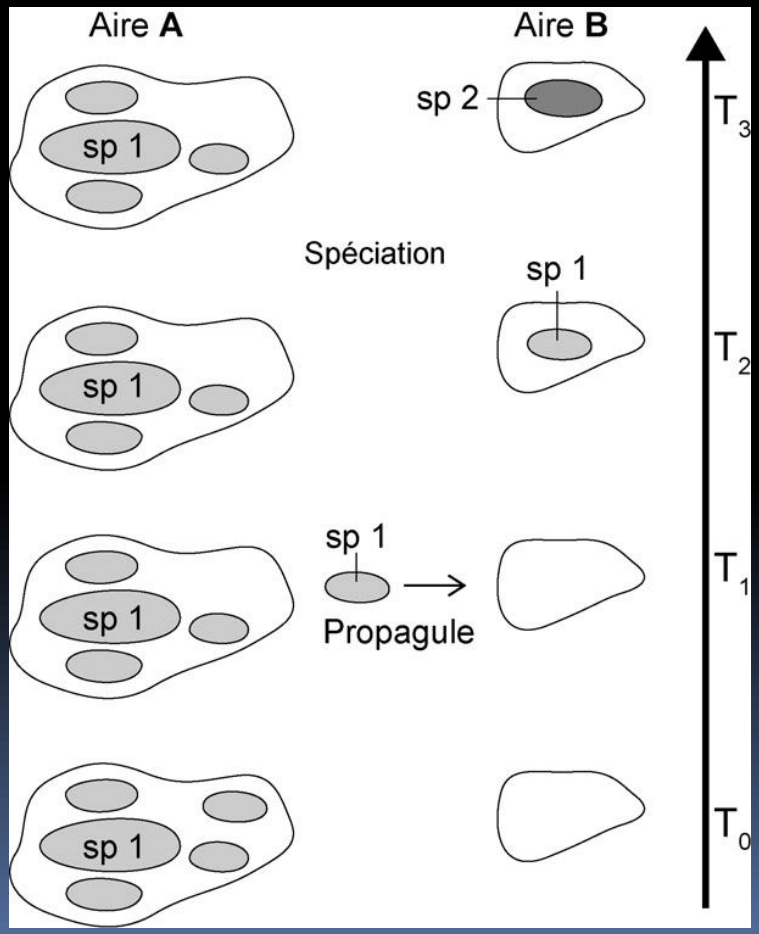


INDIA


Distribución geográfica
Historia
Vicarianza
Dispersión
(Paleo)Ecología

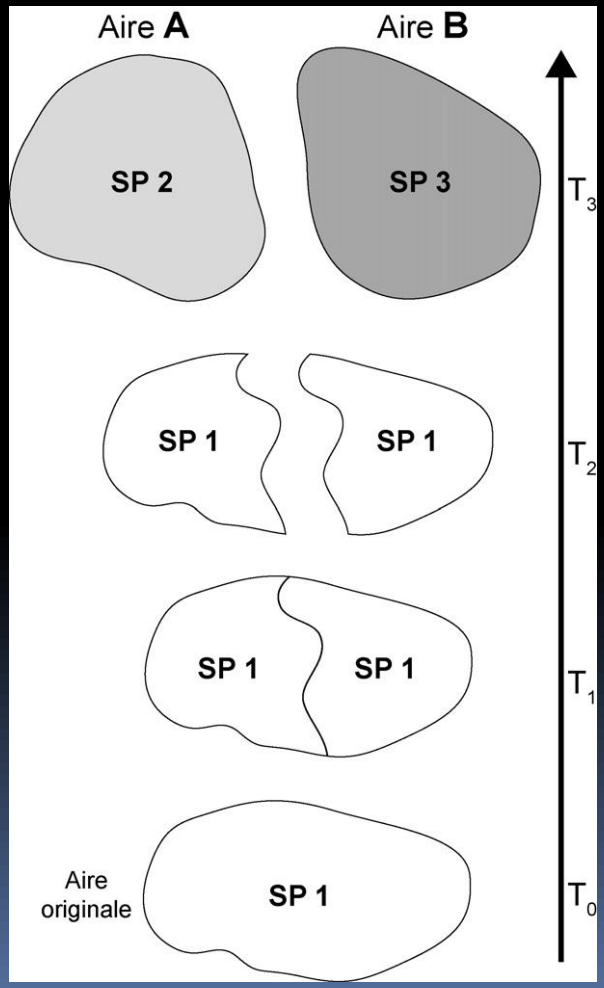
Dispersión.

los organismos tienen centros de origen y dispersión a partir de los cuales ocupan nuevas áreas.

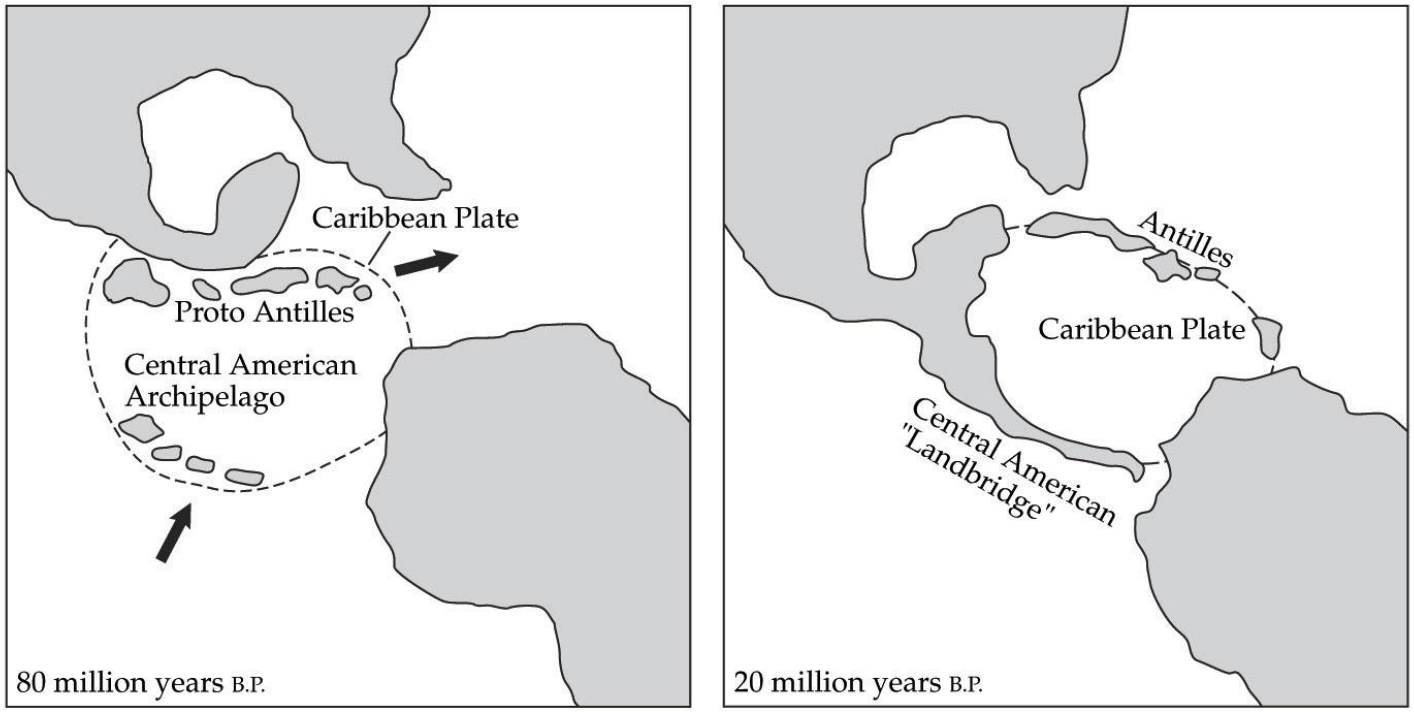


Vicarianza

aparición de barreras como fuente de novedades evolutivas



Dispersión Y Vicarianza

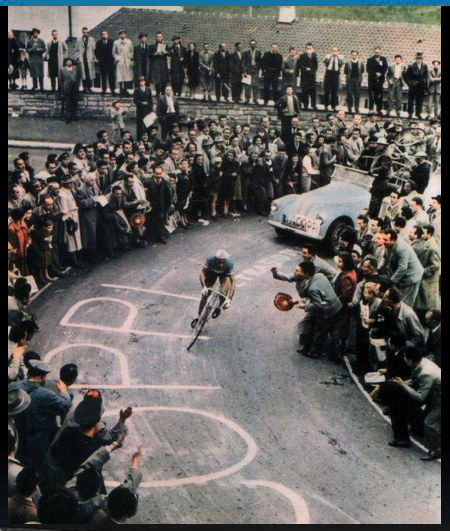


BIOGEOGRAPHY, Third Edition, Figure 8.18

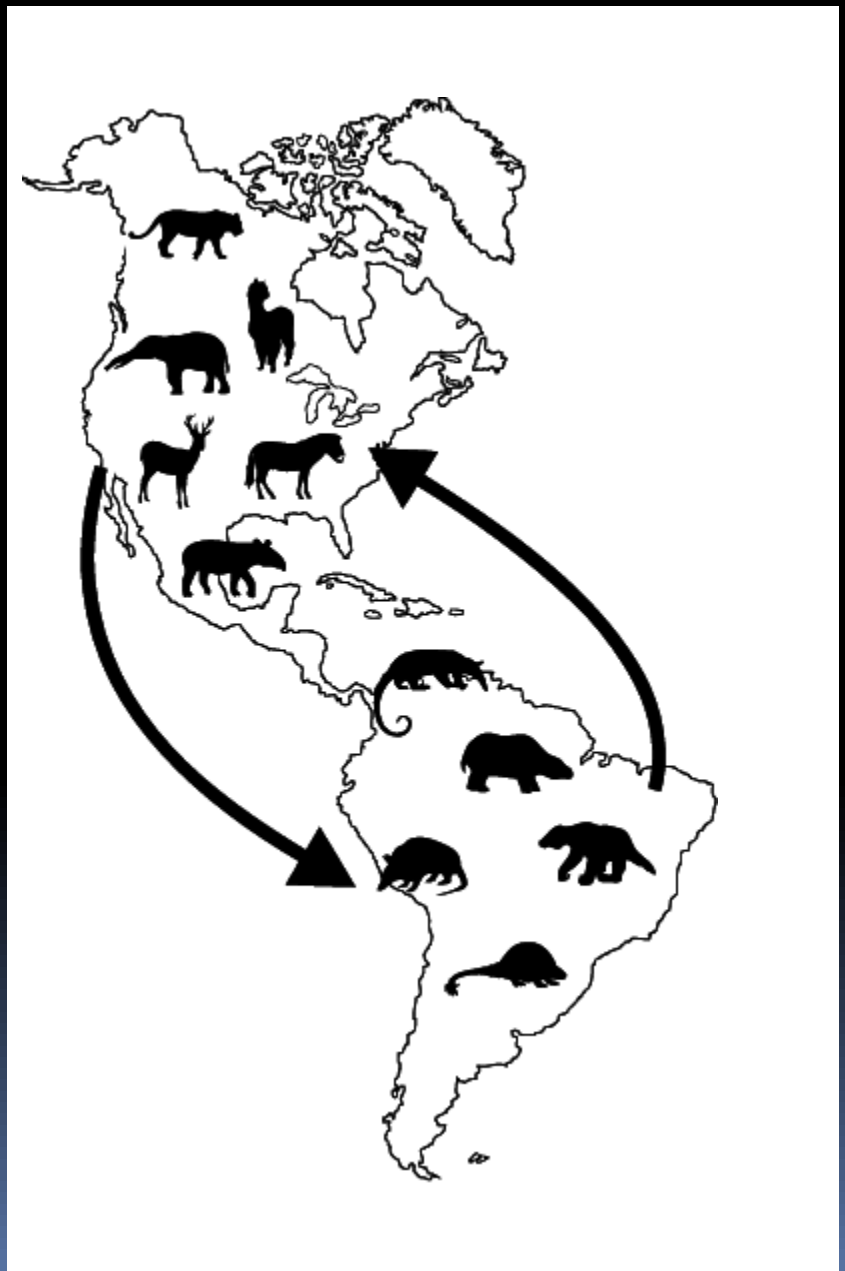
GRADOS DE RESISTENCIA A LA DISPERSIÓN

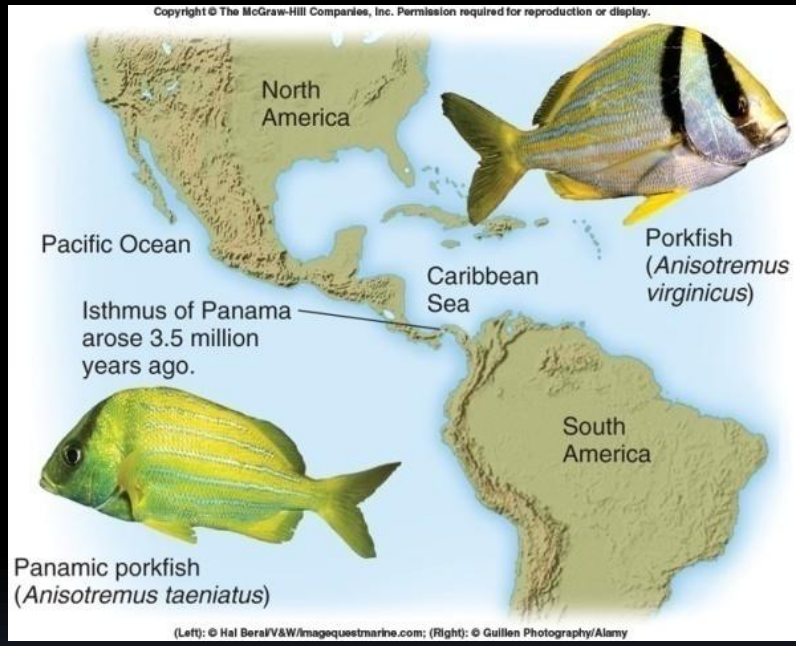
- Barrera

- Corredor



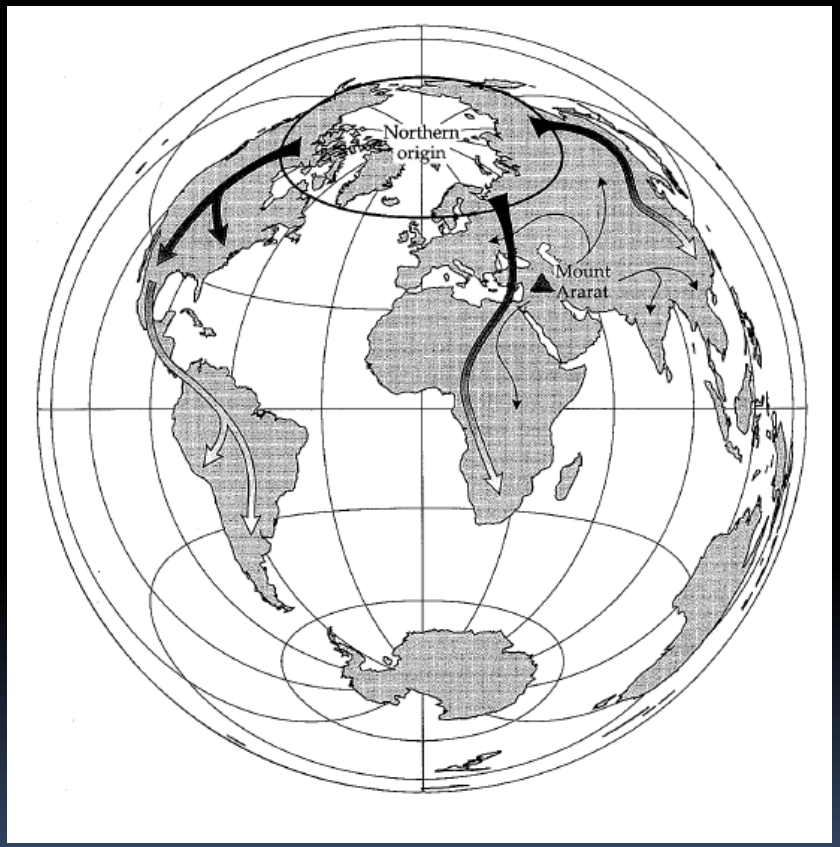
- Filtro




Copyright © The McGraw-Hill Companies, Inc. Permission required for reproduction or display.
North America
Pacific Ocean
Caribbean Sea
Isthmus of Panama arose 3.5 million years ago.
South America
Porkfish (Anisotremus virginicus)
Panamic porkfish (Anisotremus taeniatus)
(Left): © Hal Beral/V&W/imagequestmarine.com; (Right): © Guillen Photography/Alamy

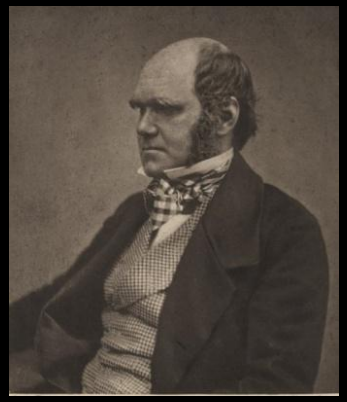
Centros de origen por creación y dispersión

Carl von Linné
(1707-1778)

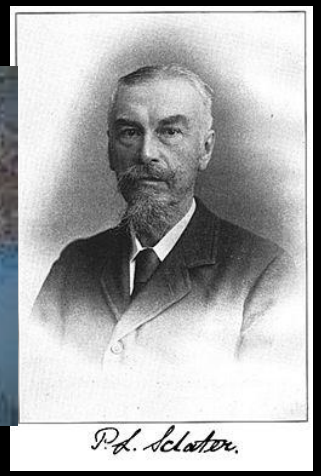


Georges-Louis Leclerc,
Comte de Buffon
(1707-1788)

Evolución,regionalización, puentes



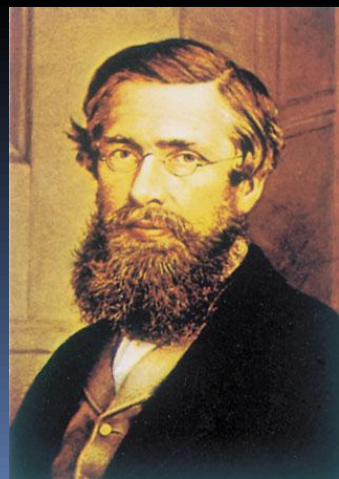
Charles Darwin
1809-1882

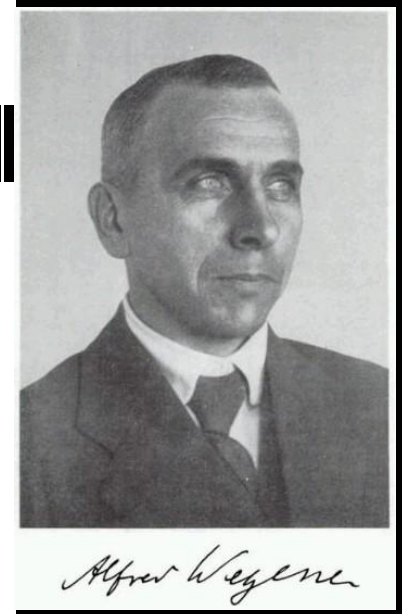


Philip Lutley Sclater
(1829-1913)

Alfred Russell Wallace

1823-1913

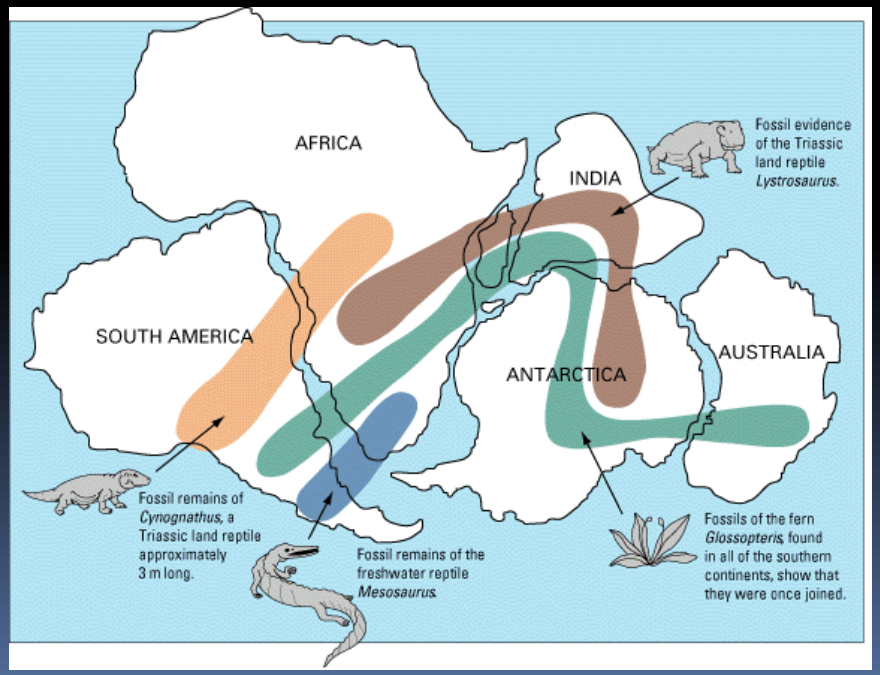


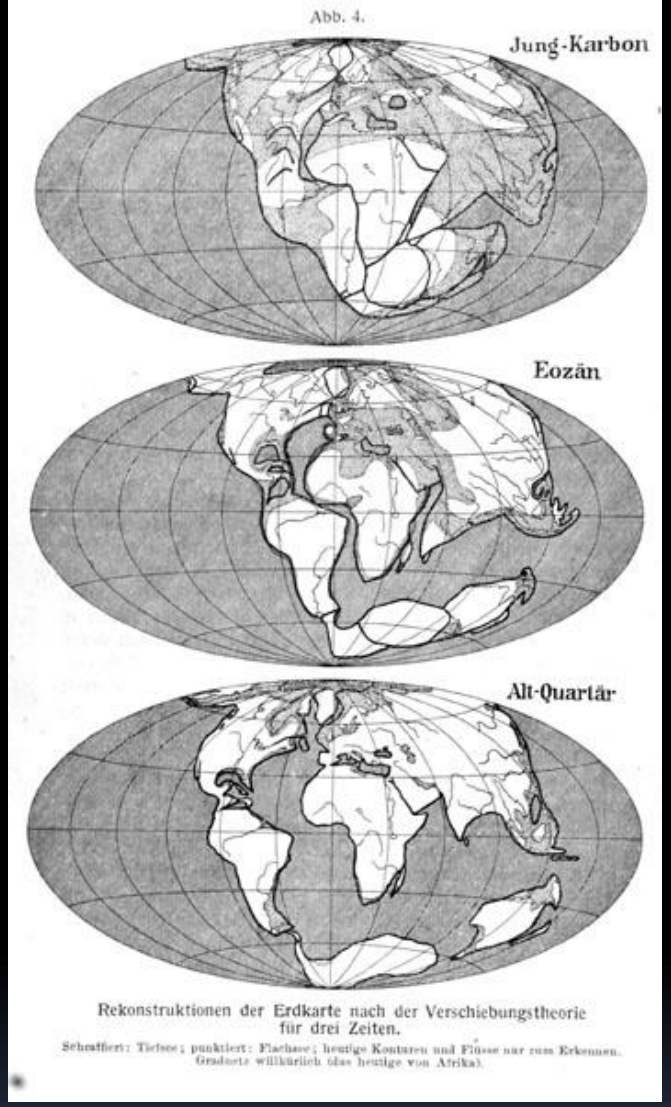


Deriva continental

1915 en adelante

1880-1930





Tectónica de placas

1962

PETROLOGIC STUDIES: A VOLUME TO HONOR
A. F. BUDDINGTON
PP. 509-620 NOVEMBER 1962

History of Ocean Basins

H. H. HESS

Princeton University, Princeton, N. J.

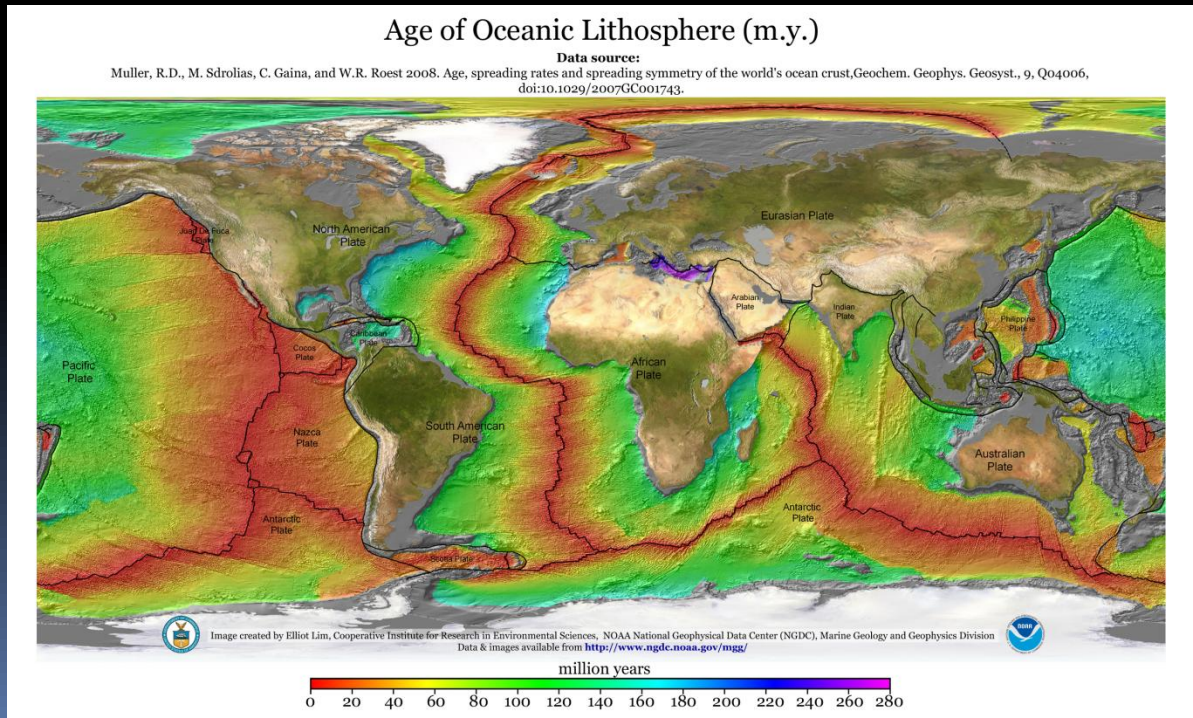
ABSTRACT

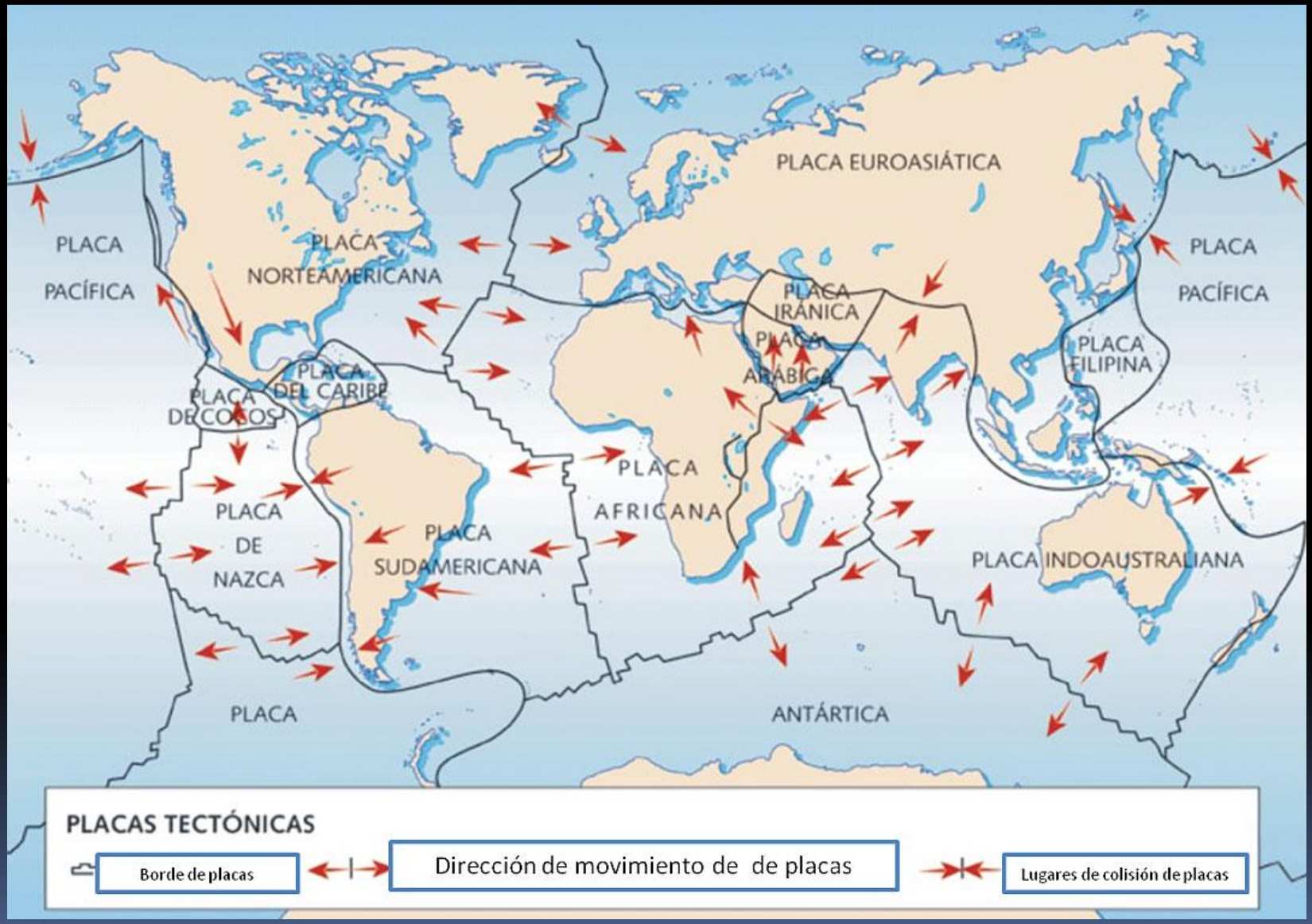
For purposes of discussion certain simplifying assumptions are made as to initial conditions on the Earth soon after its formation. It is postulated that it had little in the way of an atmosphere or oceans and that the constituents for these were derived by leakage from the interior of the Earth in the course of geologic time. Heating by short-lived radio nuclides caused partial melting and a single-cell convective overturn within the Earth which segregated an iron core, produced the primordial continents, and gave the Earth its bilateral asymmetry.

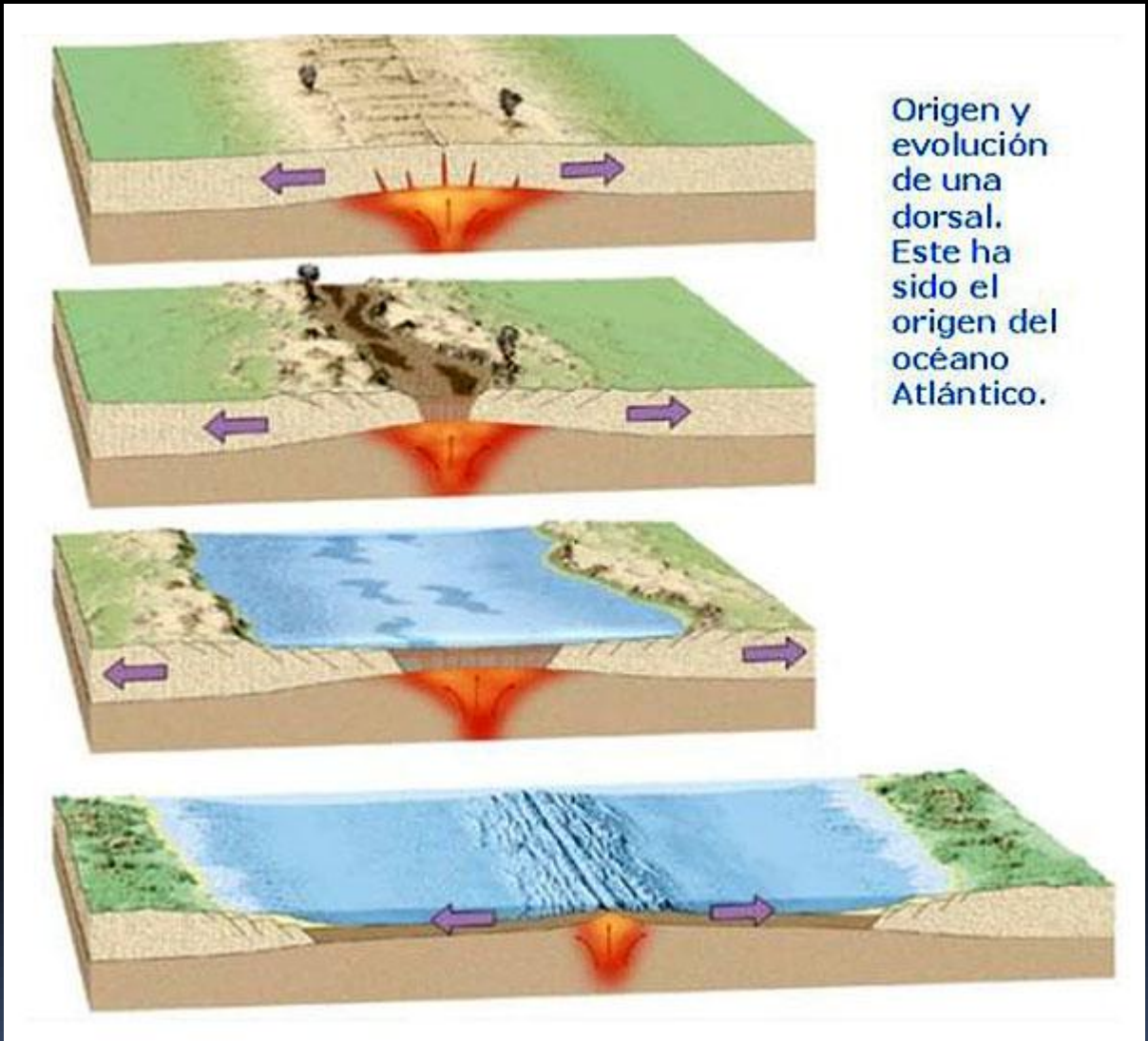
Mid-ocean ridges have high heat flow, and many of them have median rifts and show lower seismic velocities than do the common oceanic areas. They are interpreted as representing the rising limbs of mantle-convection cells.

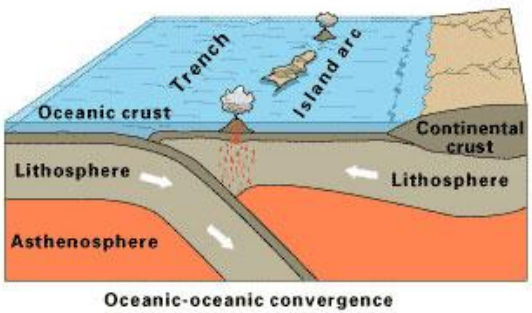
Harry Hess

1906- 1969

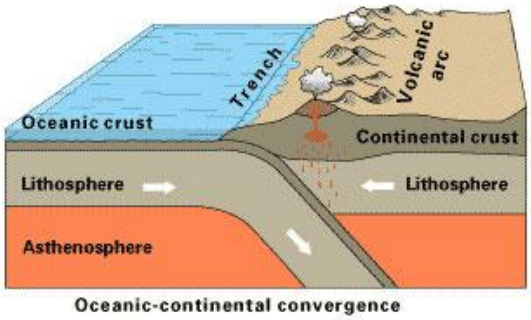



PLACA EUROASIÁTICA
PLACA PACÍFICA
PLACA NORTEAMERICANA
PLACA IRÁNICA
PLACA ARÁBICA
PLACA FILIPINA
PLACA PACÍFICA
PLACA DEL CARIBE
PLACA DE COCOS
PLACA AFRICANA
PLACA DE NAZCA
PLACA SUDAMERICANA
PLACA INDOAUSTRALIANA
PLACA ANTÁRTICA
PLACAS TECTÓNICAS
Borde de placas
Dirección de movimiento de de placas
Lugares de colisión de placas

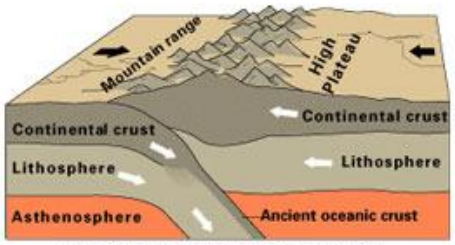

Origen y evolución de una dorsal. Este ha sido el origen del océano Atlántico.



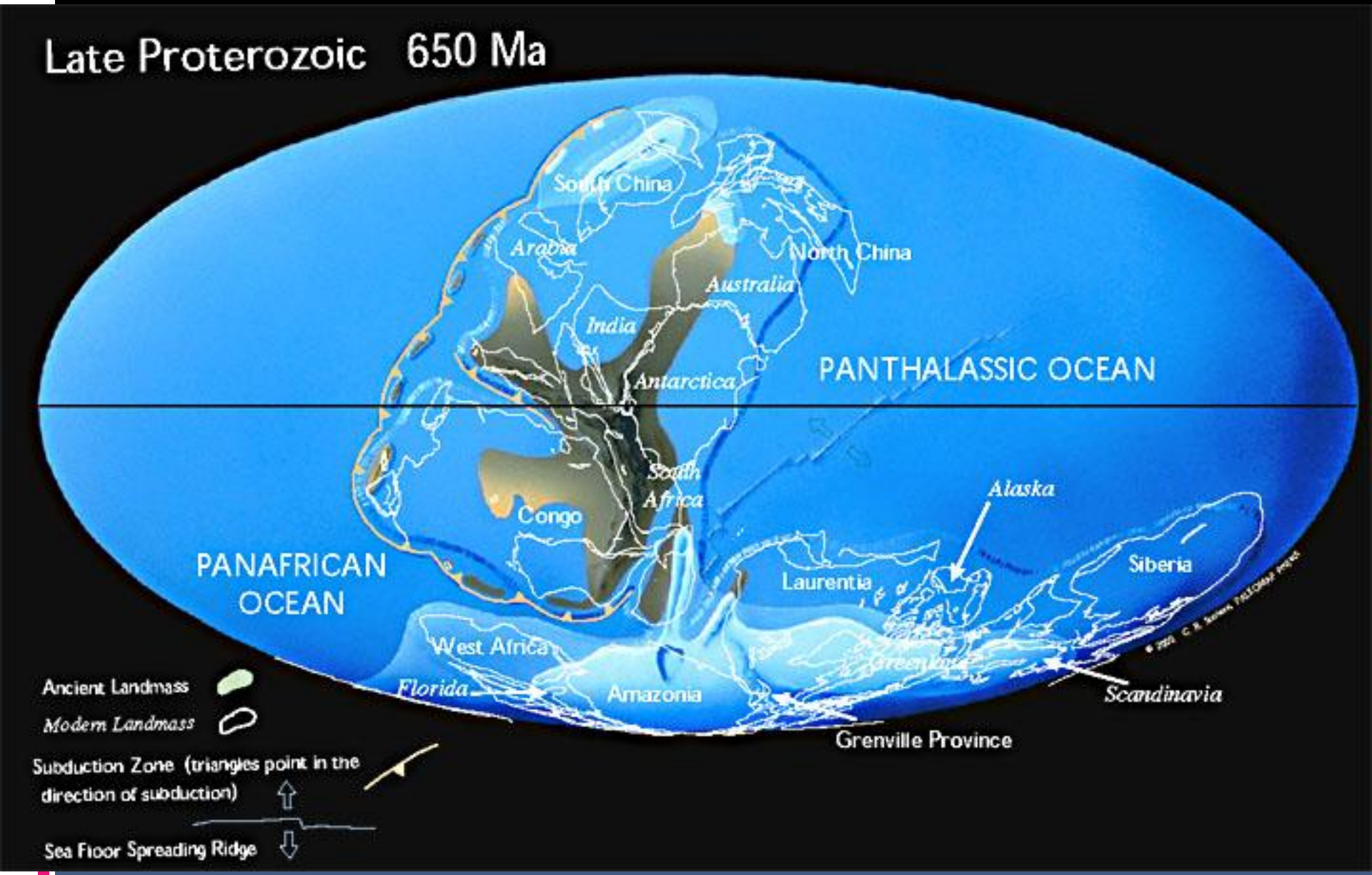
Oceanic-oceanic convergence

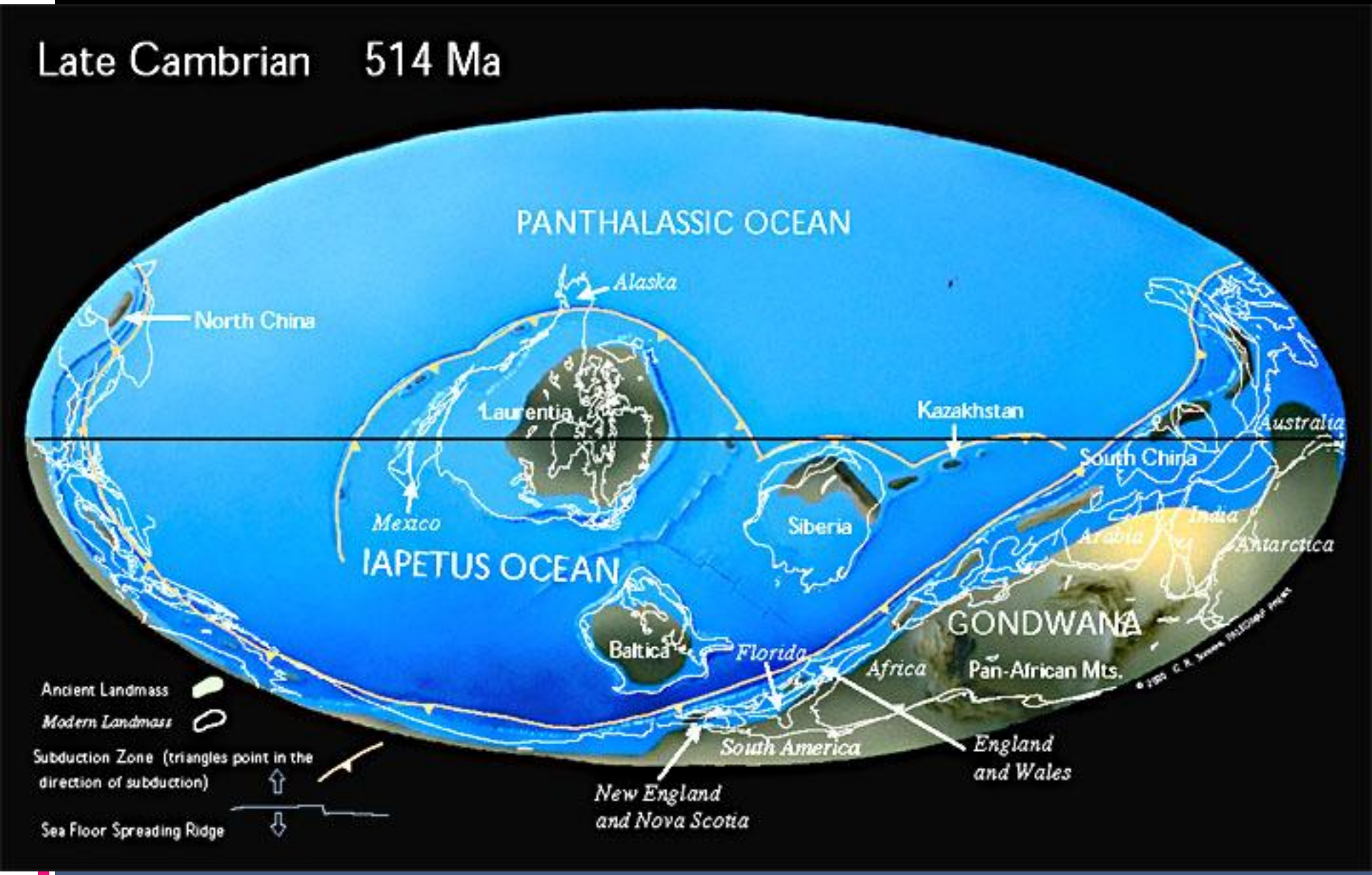


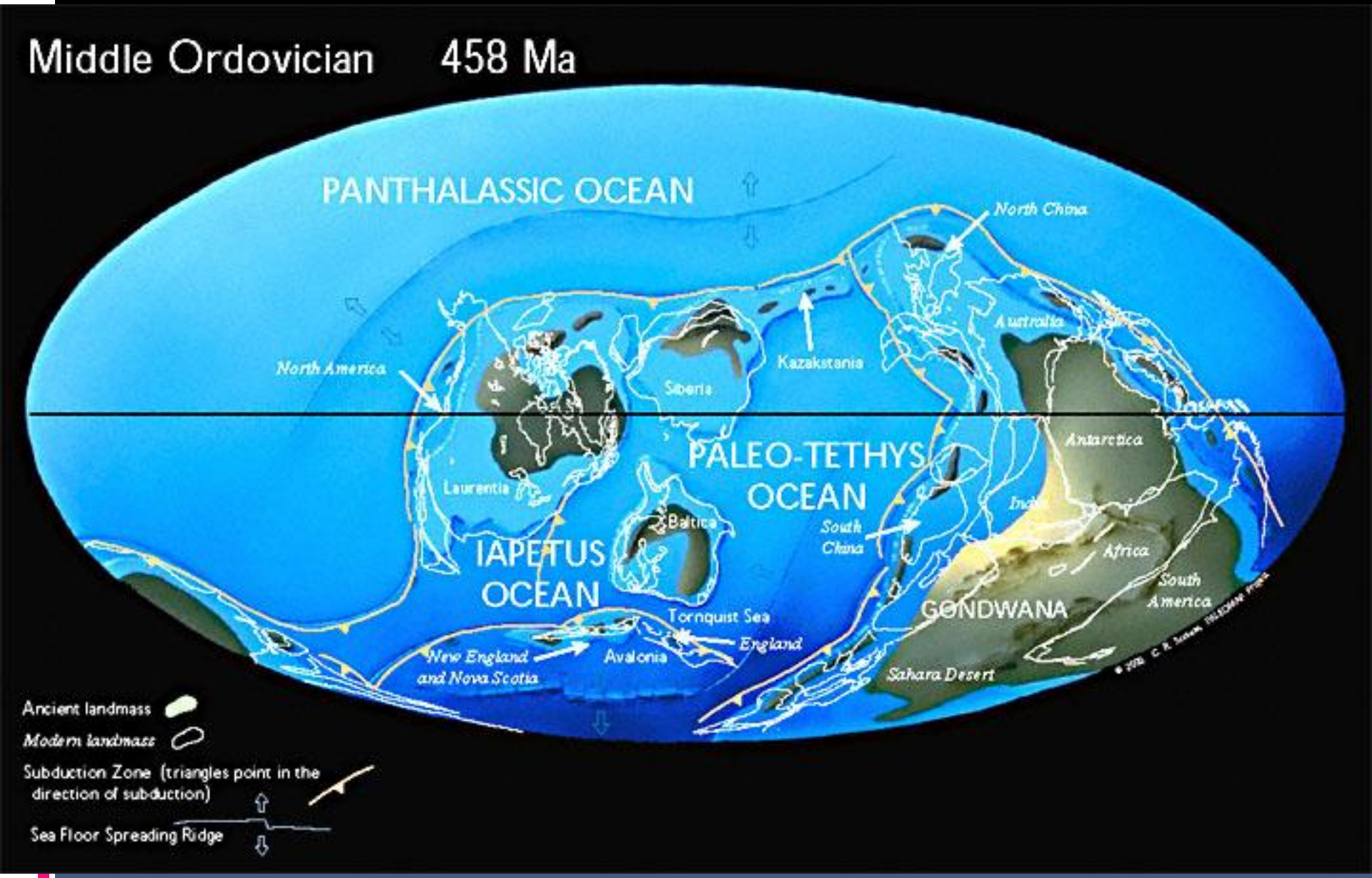
Oceanic-continental convergence

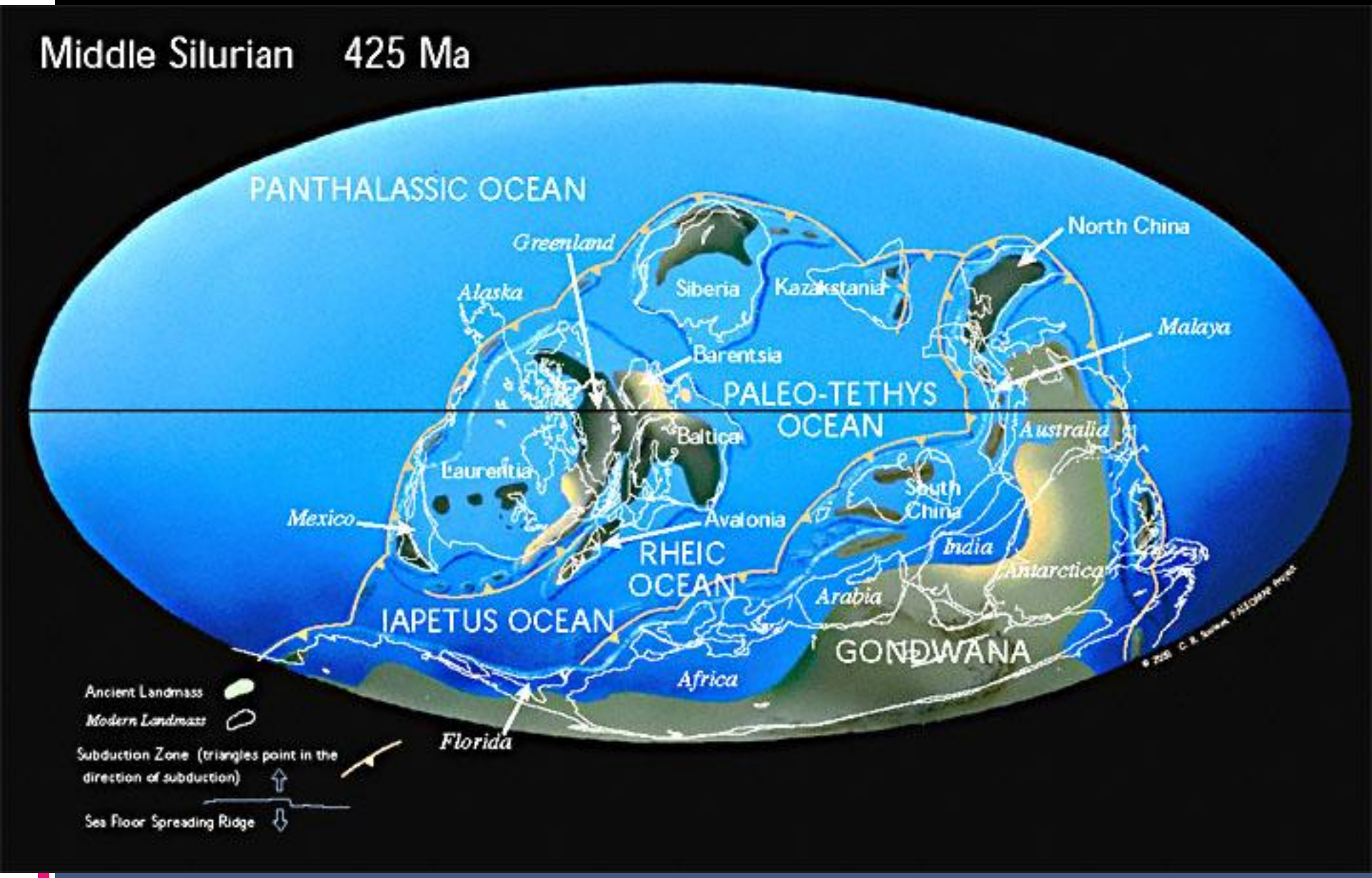


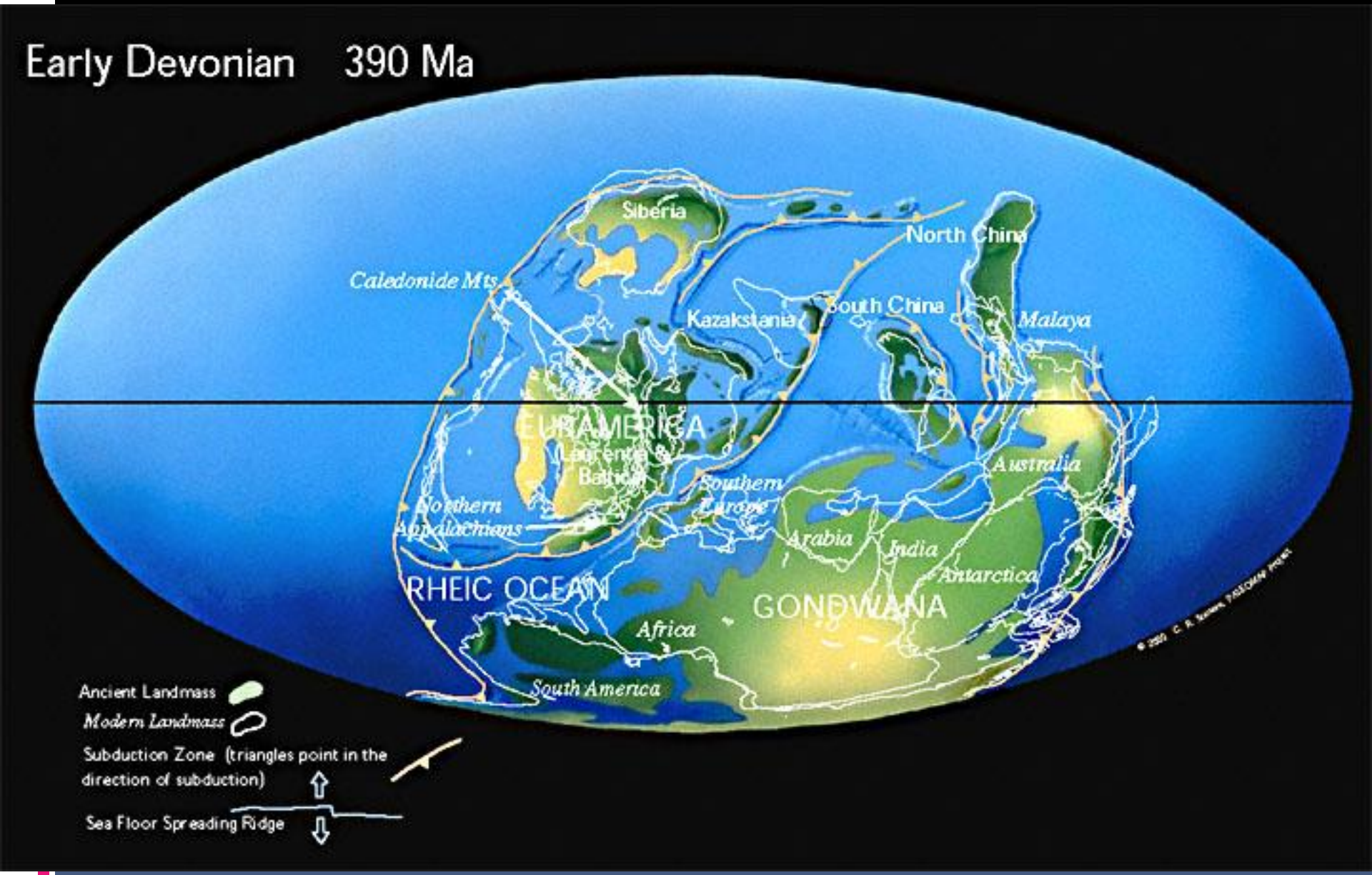
Continental-continental convergence

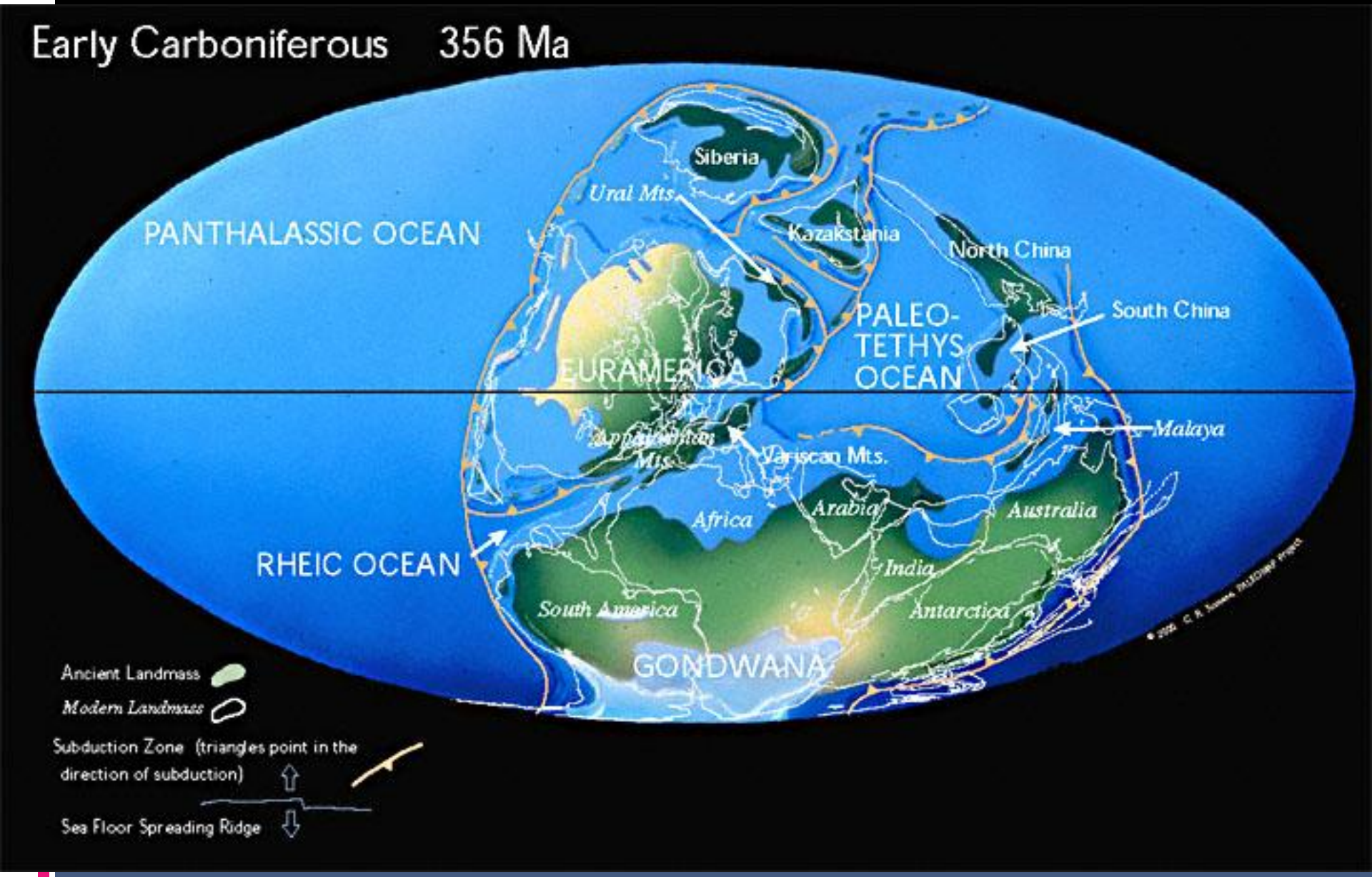

Late Proterozoic 650 Ma
South China
Arabia
North China
Australia
India
Antarctica
PANTHALASSIC OCEAN
South Africa
Congo
Alaska
PANAFRICAN OCEAN
Laurentia
Siberia
West Africa
Florida
Amazonia
Scandinavia
Grenville Province
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

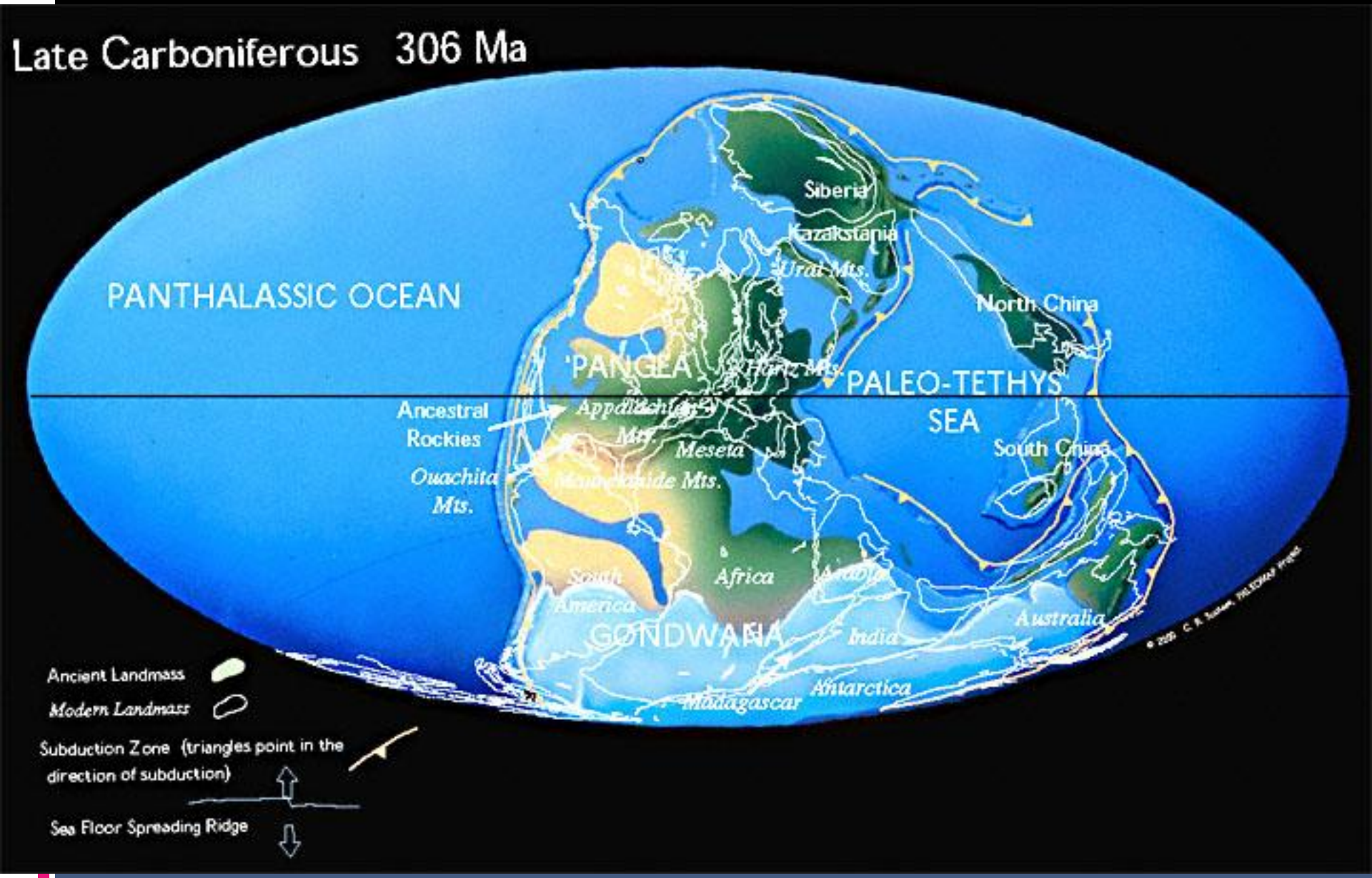

Late Cambrian 514 Ma
PANTHALASSIC OCEAN
Alaska
North China
Laurentia
Kazakhstan
Australia
South China
Mexico
Siberia
India
Arabia
Antarctica
IAPETUS OCEAN
GONDWANA
Baltica
Florida
Africa
Pan-African Mts.
South America
England and Wales
New England and Nova Scotia
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

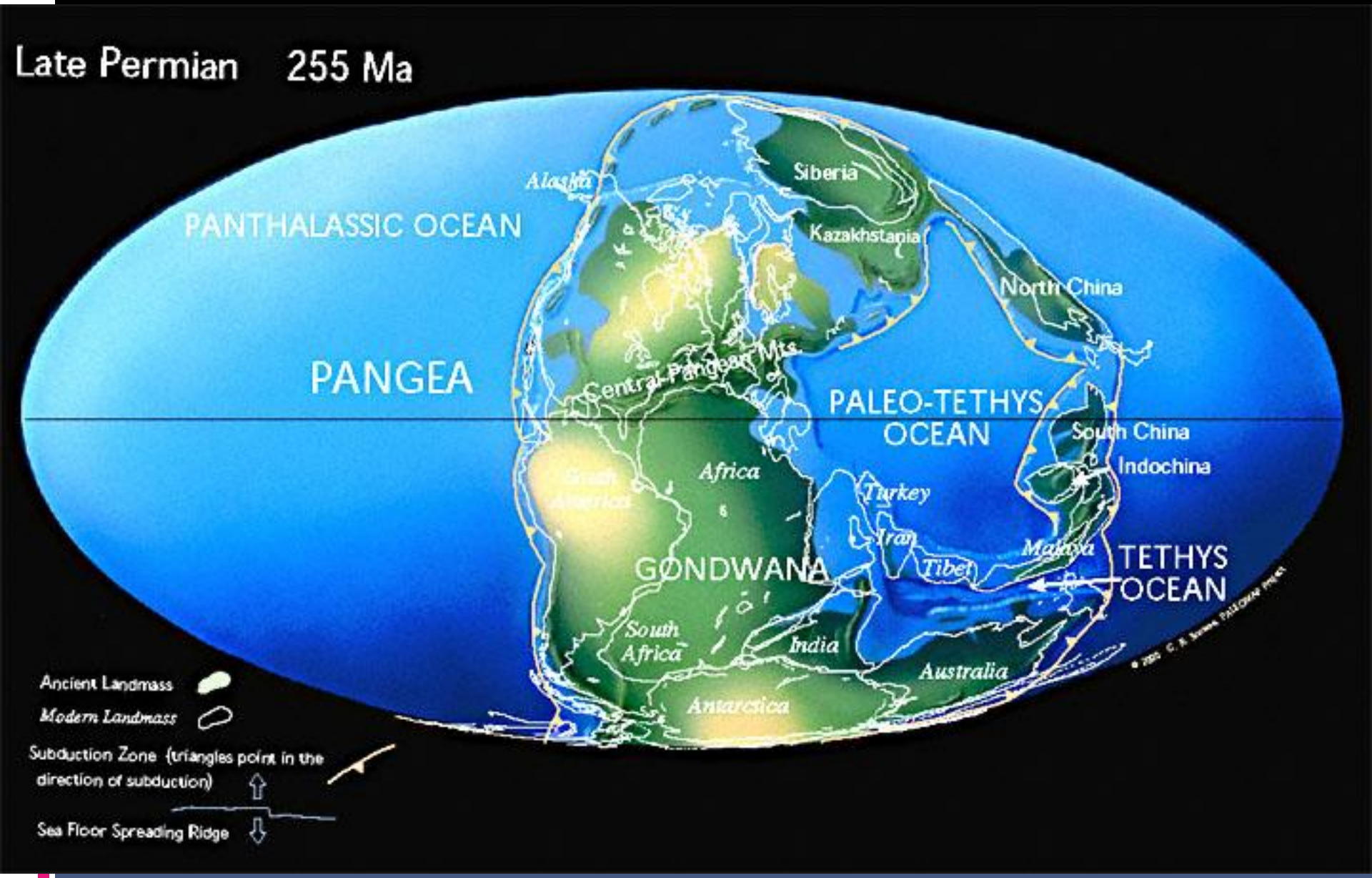

Middle Ordovician 458 Ma
PANTHALASSIC OCEAN
North China
North America
Kazakstania
Siberia
Australia
Laurentia
PALEO-TETHYS OCEAN
Antarctica
Baltica
South China
IAPETUS OCEAN
Africa
South America
GONDWANA
Tornquist Sea
England
New England and Nova Scotia
Avalonia
Sahara Desert
Ancient landmass
Modern landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

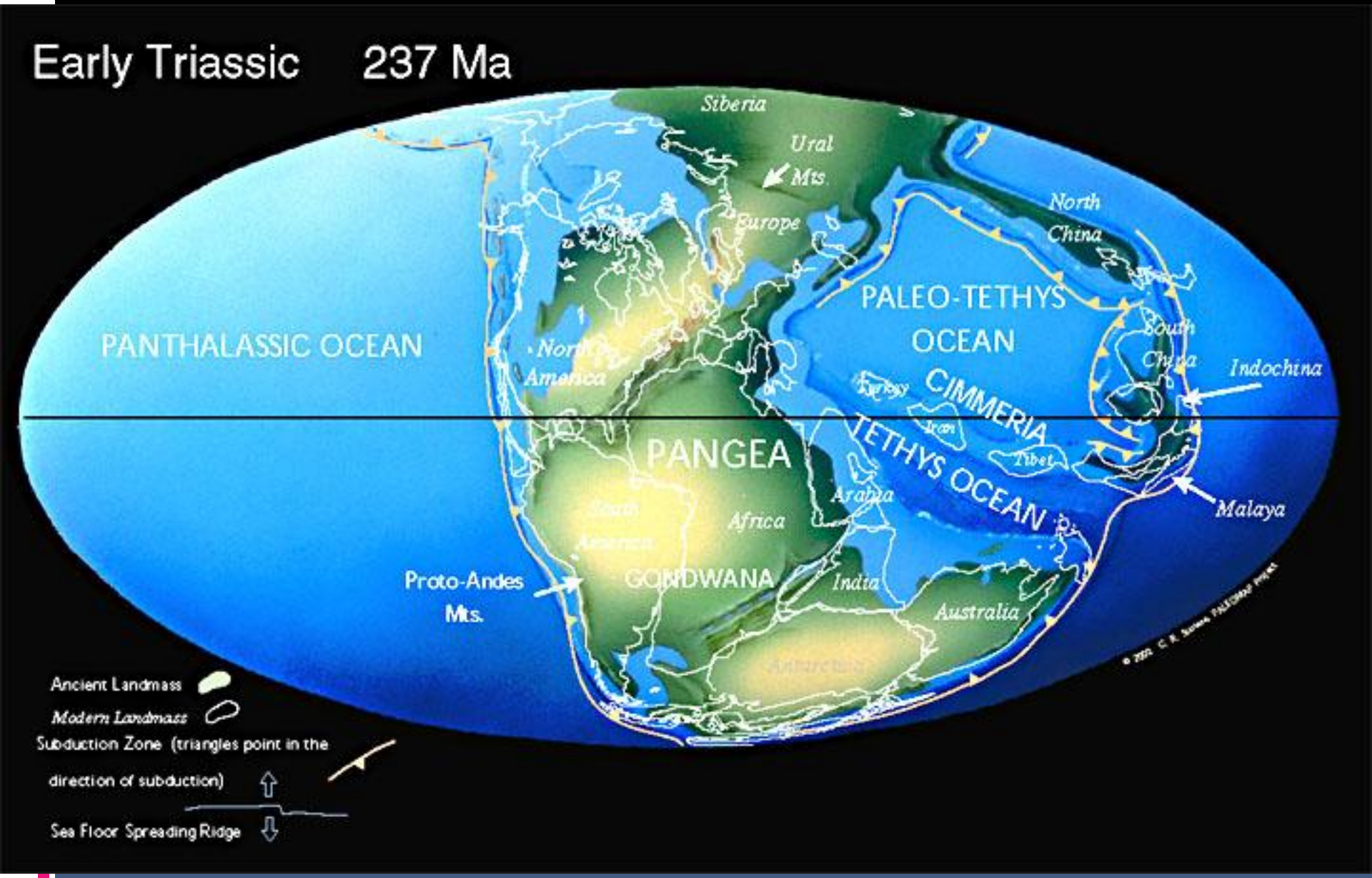

Middle Silurian 425 Ma
PANTHALASSIC OCEAN
Greenland
Alaska
Siberia
Kazakstania
North China
Malaya
Barentsia
PALEO-TETHYS OCEAN
Baltica
Laurentia
Australia
South China
Mexico
Avalonia
India
RHEIC OCEAN
Antarctica
Arabia
IAPETUS OCEAN
GONDWANA
Africa
Florida
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

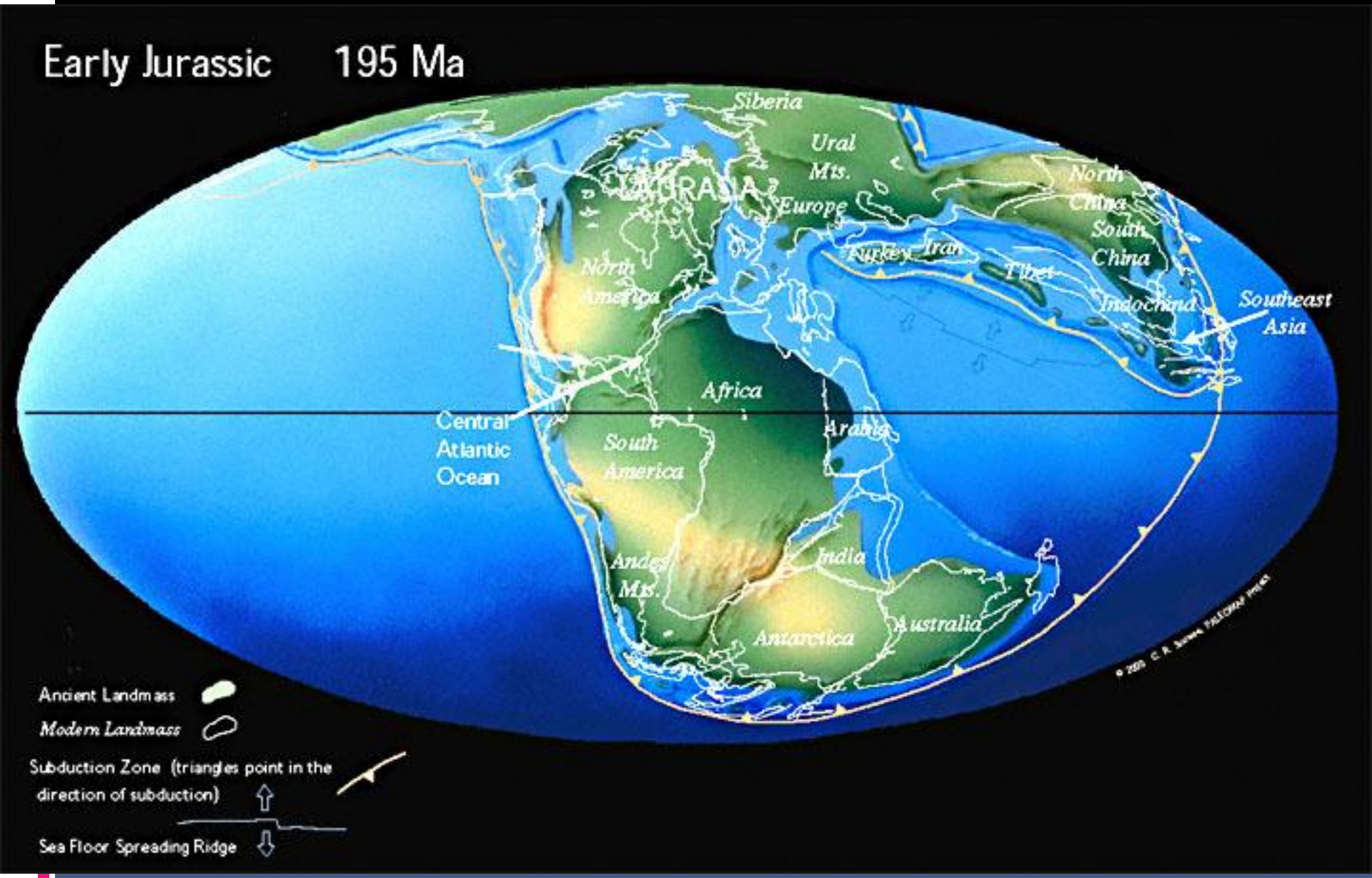

Early Devonian 390 Ma
Siberia
North China
Caledonide Mts
Kazakstania
South China
Malaya
EURAMERICA
Laurentia
Baltica
Southern Europe
Northern Appalachians
Australia
Arabia
India
Antarctica
RHEIC OCEAN
GONDWANA
Africa
South America
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

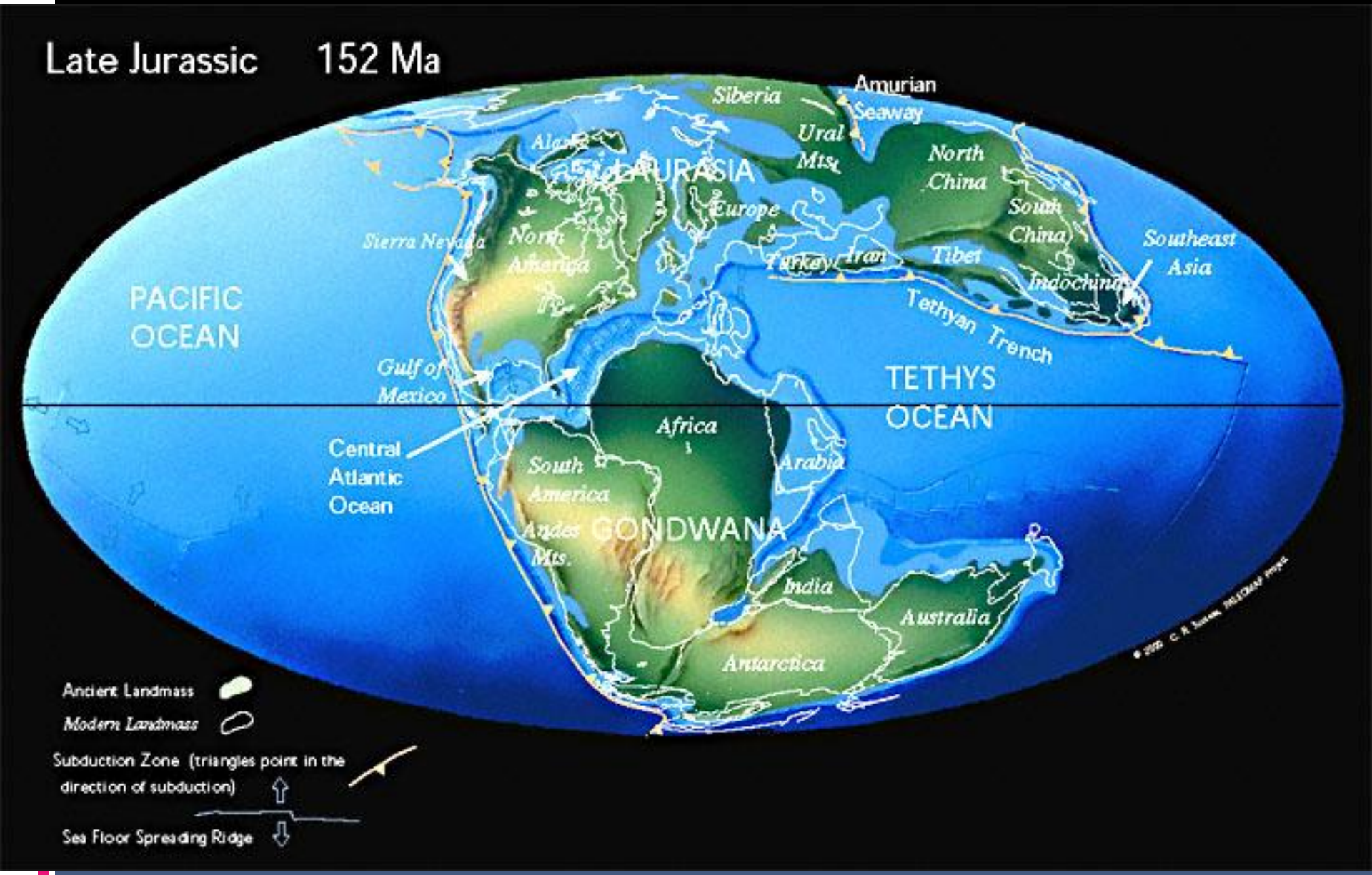

Early Carboniferous 356 Ma
PANTHALASSIC OCEAN
Siberia
Ural Mts.
Kazakstania
North China
South China
PALEO-
TETHYS
OCEAN
EURAMERICA
Malaya
Appalachian
Mts.
Variscan Mts.
Africa
Arabia
Australia
India
RHEIC OCEAN
South America
Antarctica
GONDWANA
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the
direction of subduction)
Sea Floor Spreading Ridge

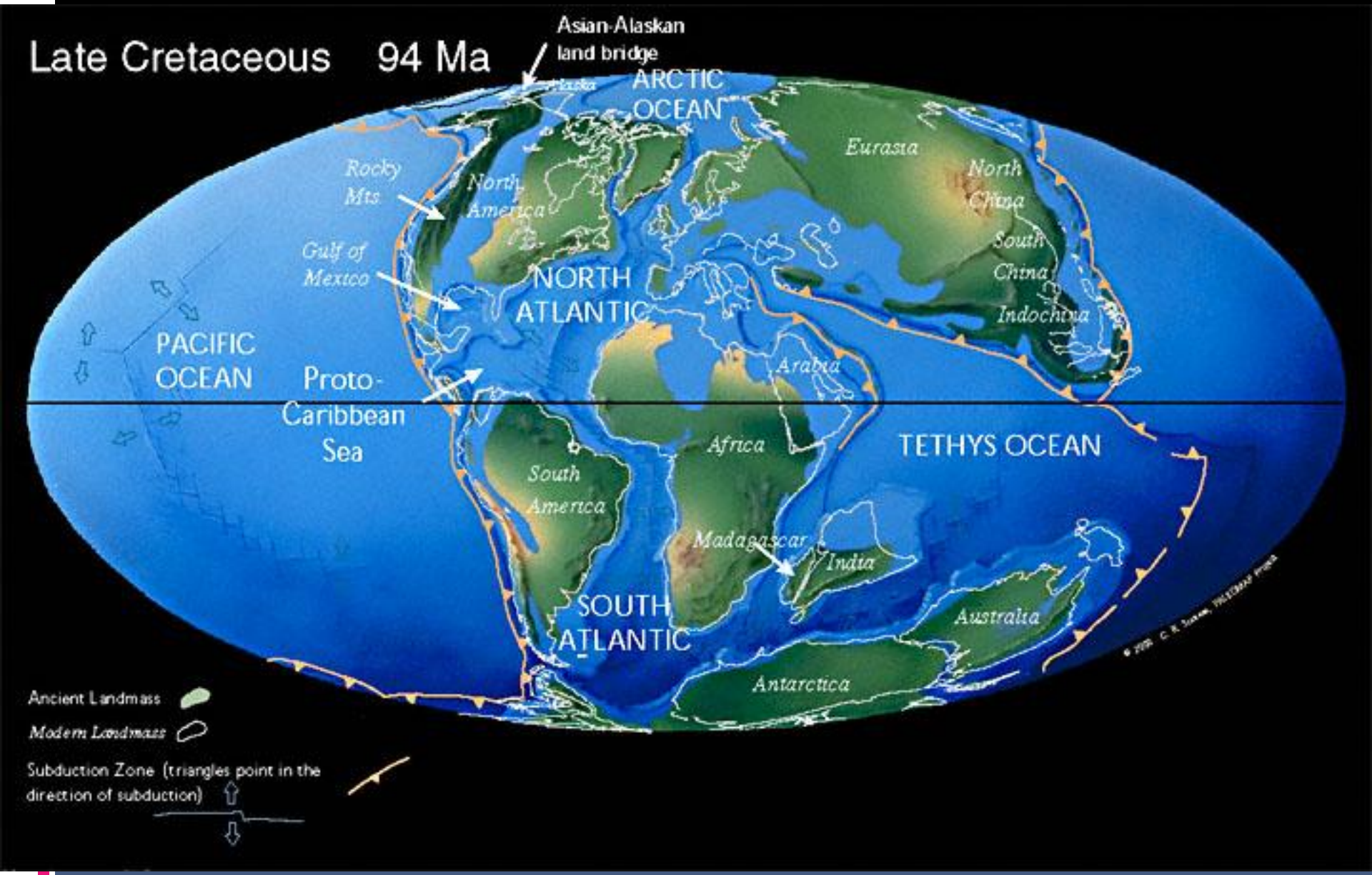

Late Carboniferous 306 Ma
PANTHALASSIC OCEAN
Siberia
Kazakstania
Urat Mts.
North China
PANGEA
Hartz Mts.
PALEO-TETHYS SEA
Ancestral Rockies
Appalachian Mt.
Meseta
South China
Ouachita Mts.
Cordilleran Mts.
Africa
South America
GONDWANA
India
Australia
Antarctica
Madagascar
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

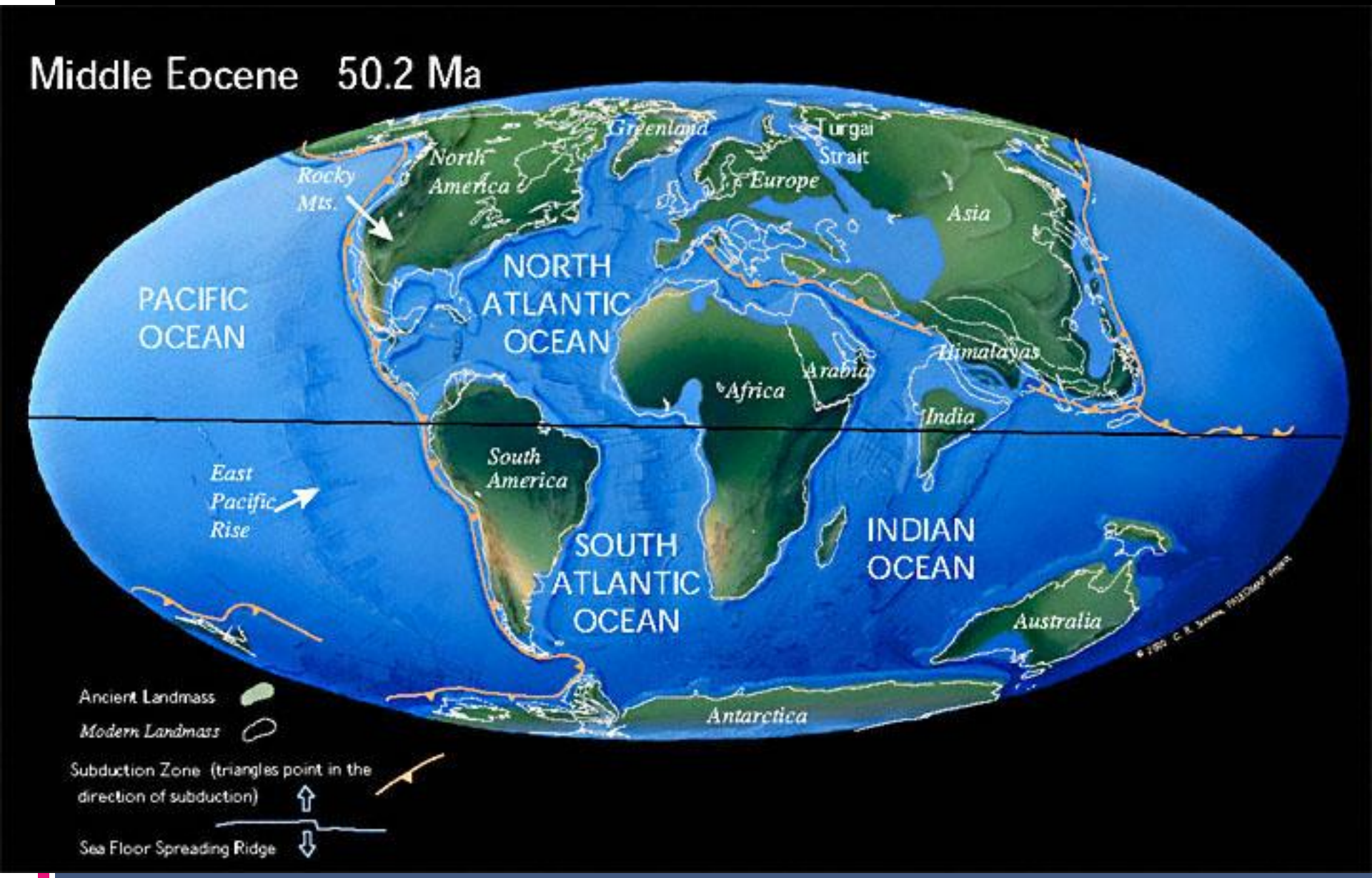

Late Permian 255 Ma
PANTHALASSIC OCEAN
PANGEA
Alaska
Siberia
Kazakhstania
North China
Central Pangean Mts.
PALEO-TETHYS OCEAN
South China
Indochina
Africa
South America
Turkey
Iran
Malaya
Tibet
GONDWANA
TETHYS OCEAN
South Africa
India
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

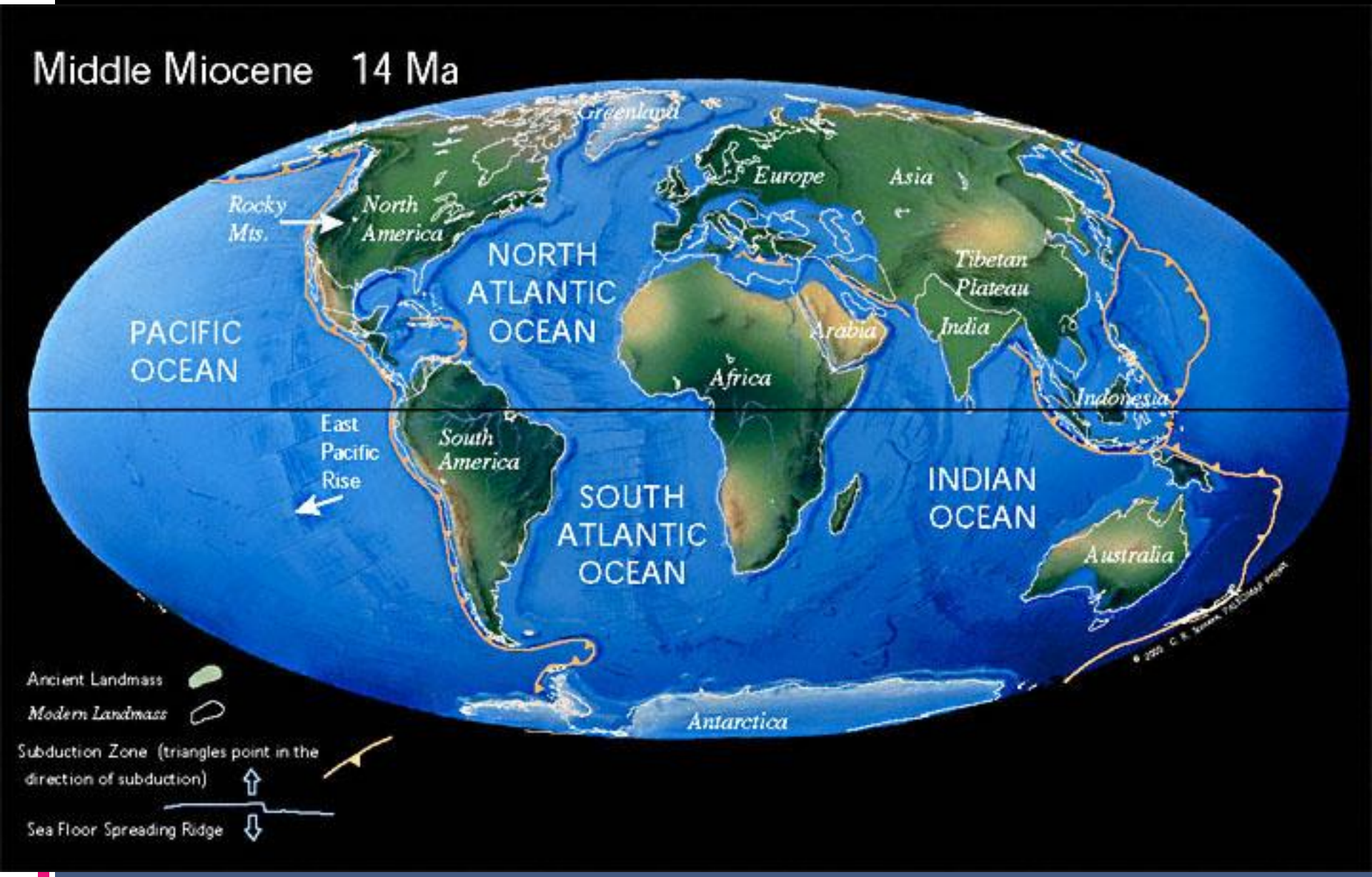

Early Triassic 237 Ma
Siberia
Ural Mts.
Europe
North China
PALEO-TETHYS OCEAN
South China
Indochina
PANTHALASSIC OCEAN
North America
CIMMERIA
TETHYS OCEAN
PANGEA
Tibet
Arabia
Malaya
Africa
South America
Proto-Andes Mts.
GONDWANA
India
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

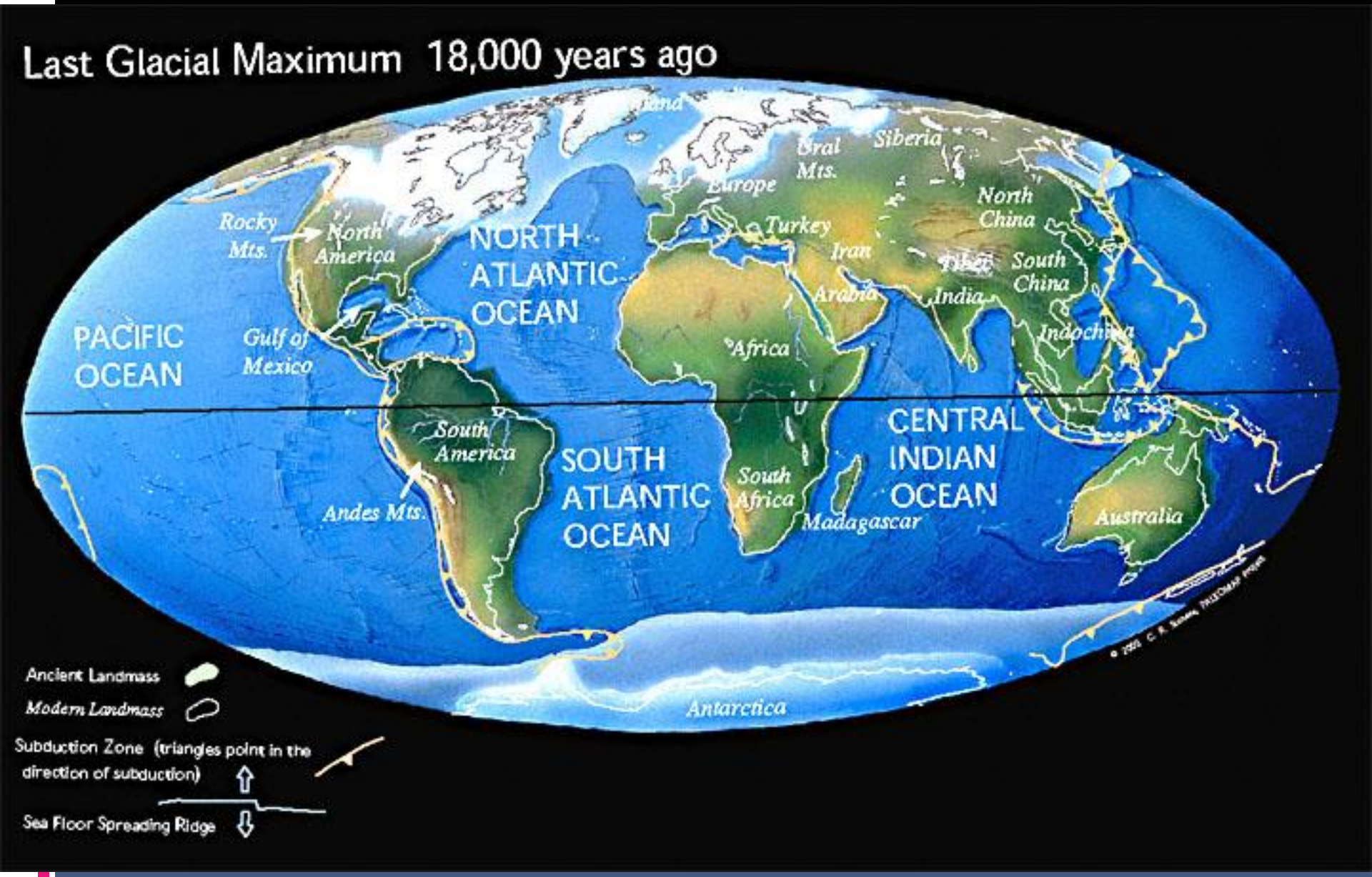

Early Jurassic 195 Ma
Siberia
Ural Mts.
LAURASIA
Europe
North China
South China
Turkey
Iran
Tibet
Indochina
Southeast Asia
North America
Africa
Central Atlantic Ocean
Arabia
South America
Andes Mts.
India
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

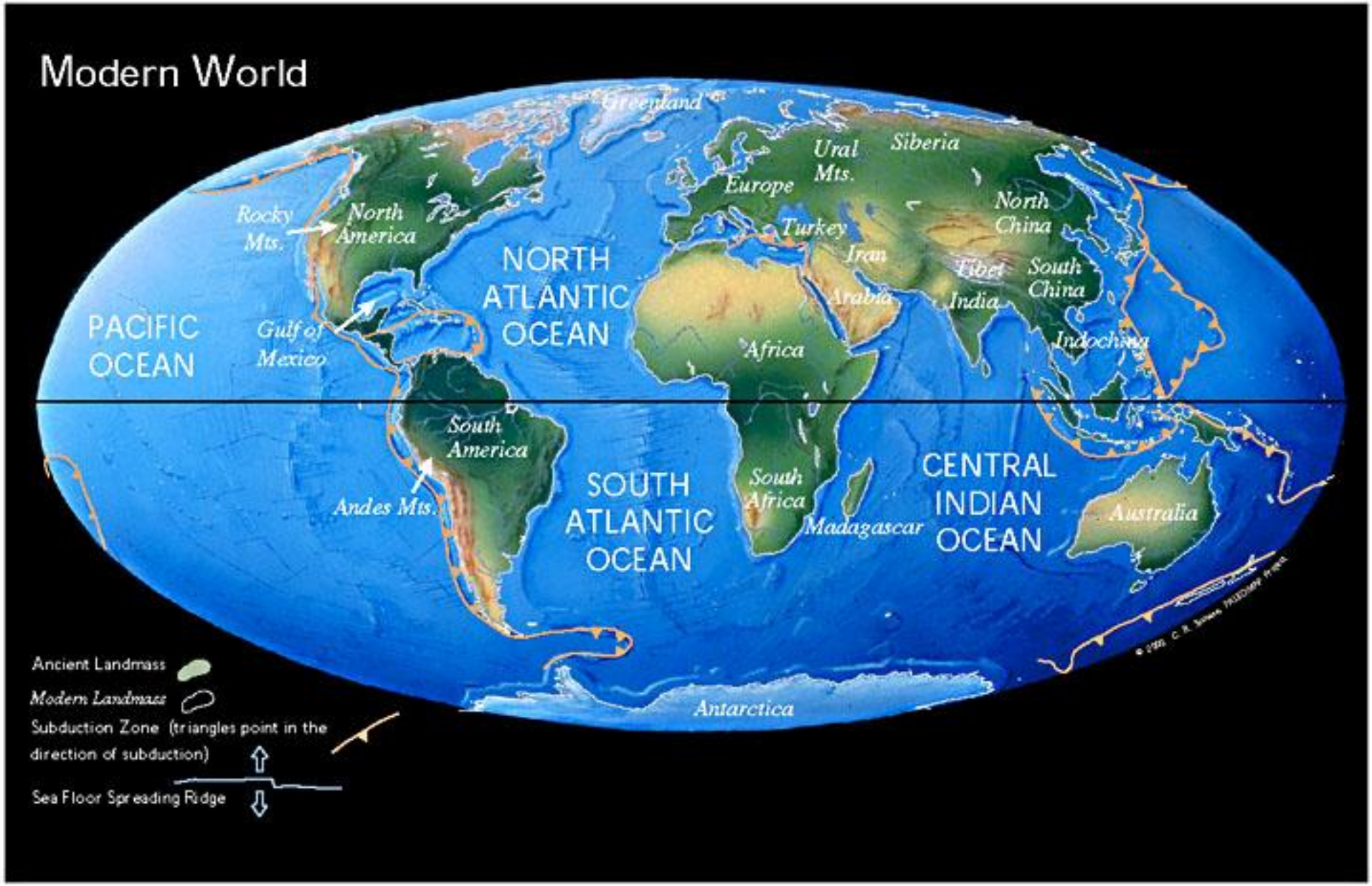

Late Jurassic 152 Ma
Siberia
Amurian Seaway
Ural Mts.
LAURASIA
North China
South China
Europe
Sierra Nevada
North America
Turkey
Iran
Tibet
Indochina
Southeast Asia
PACIFIC OCEAN
Tethyan Trench
TETHYS OCEAN
Gulf of Mexico
Central Atlantic Ocean
Africa
Arabia
South America
Andes Mts.
GONDWANA
India
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

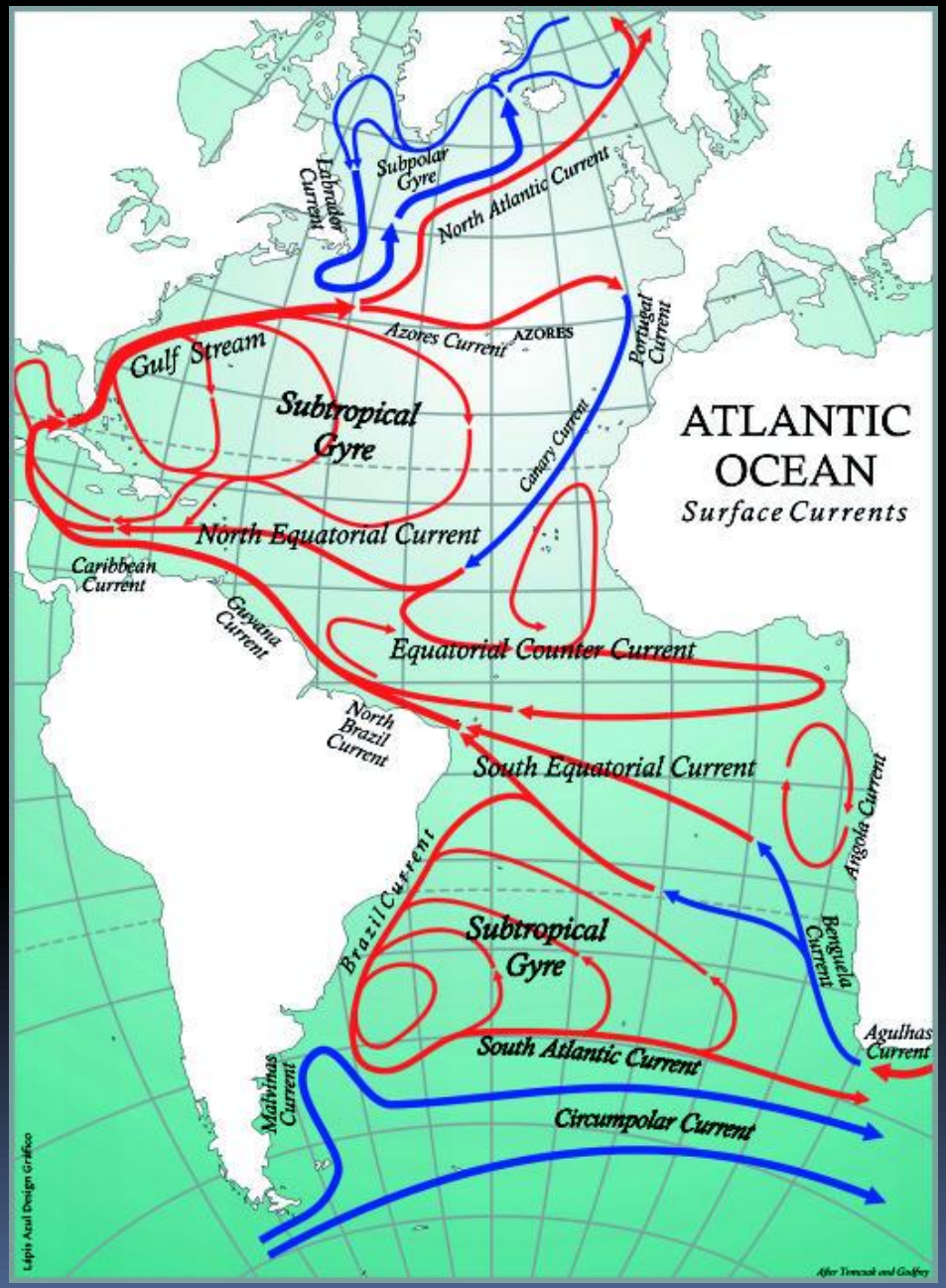

Late Cretaceous 94 Ma
Asian-Alaskan land bridge
ARCTIC OCEAN
Eurasia
North China
South China
Indochina
Rocky Mts
North America
Gulf of Mexico
NORTH ATLANTIC
PACIFIC OCEAN
Proto-Caribbean Sea
Arabia
Africa
TETHYS OCEAN
South America
Madagascar
India
SOUTH ATLANTIC
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)


Middle Eocene 50.2 Ma
Greenland
Turgai Strait
North America
Rocky Mts.
Europe
Asia
PACIFIC OCEAN
NORTH ATLANTIC OCEAN
Himalayas
Arabia
Africa
India
South America
East Pacific Rise
SOUTH ATLANTIC OCEAN
INDIAN OCEAN
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge


Middle Miocene 14 Ma
Greenland
Europe
Asia
Rocky Mts.
North America
NORTH ATLANTIC OCEAN
Tibetan Plateau
India
Arabia
PACIFIC OCEAN
Africa
Indonesia
East Pacific Rise
South America
SOUTH ATLANTIC OCEAN
INDIAN OCEAN
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

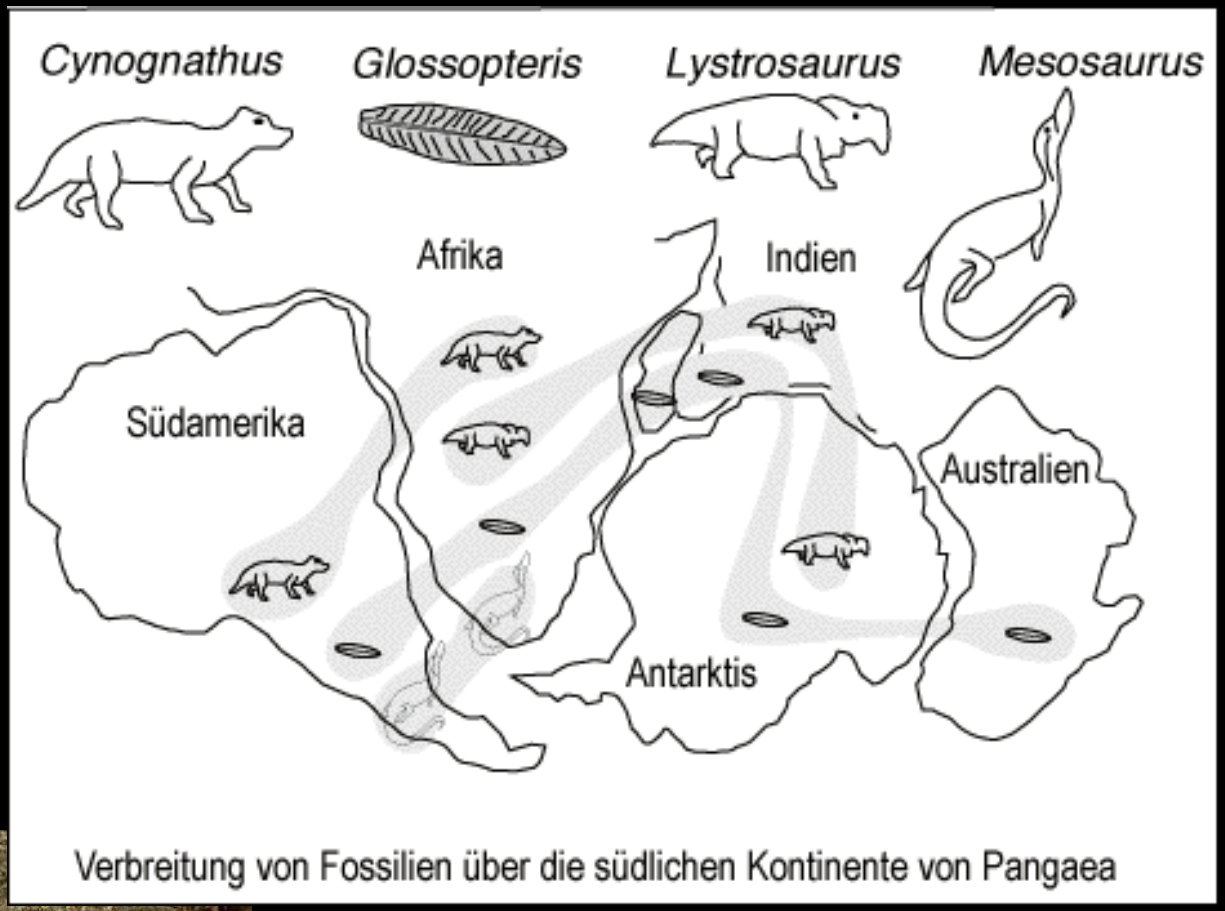

Last Glacial Maximum 18,000 years ago
Siberia
Ural Mts.
Europe
North China
Rocky Mts.
North America
NORTH ATLANTIC OCEAN
Turkey
Iran
Tibet
South China
Arabia
India
PACIFIC OCEAN
Gulf of Mexico
Africa
Indochina
South America
SOUTH ATLANTIC OCEAN
CENTRAL INDIAN OCEAN
South Africa
Madagascar
Andes Mts.
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge


Modern World
Greenland
Ural Mts.
Siberia
Europe
North China
Rocky Mts.
North America
Turkey
Iran
Tibet
South China
India
Arabia
Indochina
PACIFIC OCEAN
Gulf of Mexico
NORTH ATLANTIC OCEAN
Africa
South America
Andes Mts.
SOUTH ATLANTIC OCEAN
South Africa
Madagascar
CENTRAL INDIAN OCEAN
Australia
Antarctica
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge

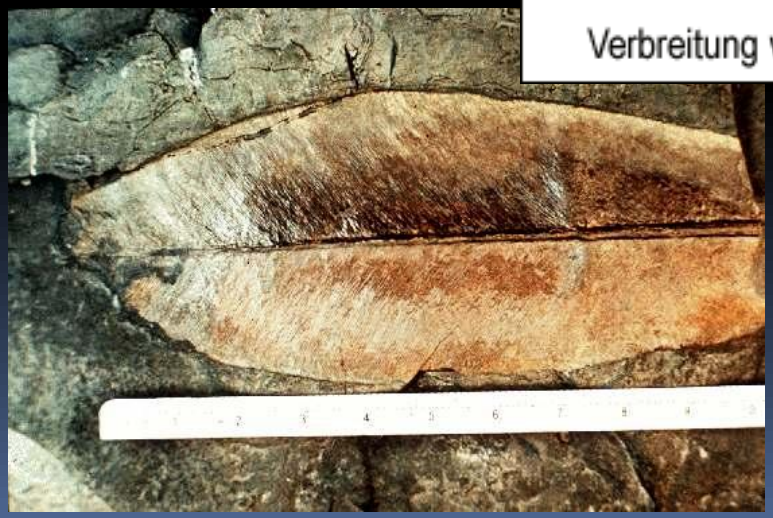

ATLANTIC
OCEAN
Surface Currents
Labrador Current
Subpolar Gyre
North Atlantic Current
Gulf Stream
Azores Current
AZORES
Portugal Current
Subtropical Gyre
Canary Current
North Equatorial Current
Caribbean Current
Guyana Current
Equatorial Counter Current
North Brazil Current
South Equatorial Current
Angola Current
Brazil Current
Subtropical Gyre
Benguela Current
Agulhas Current
South Atlantic Current
Malvinas Current
Circumpolar Current
Lápis Azul Design Gráfico
After Tomczak and Godfrey

La configuración continental es determinante en la circulación y por lo tanto en el clima y en el establecimiento de puentes y barreras (y en la dispersión o vicarianza).

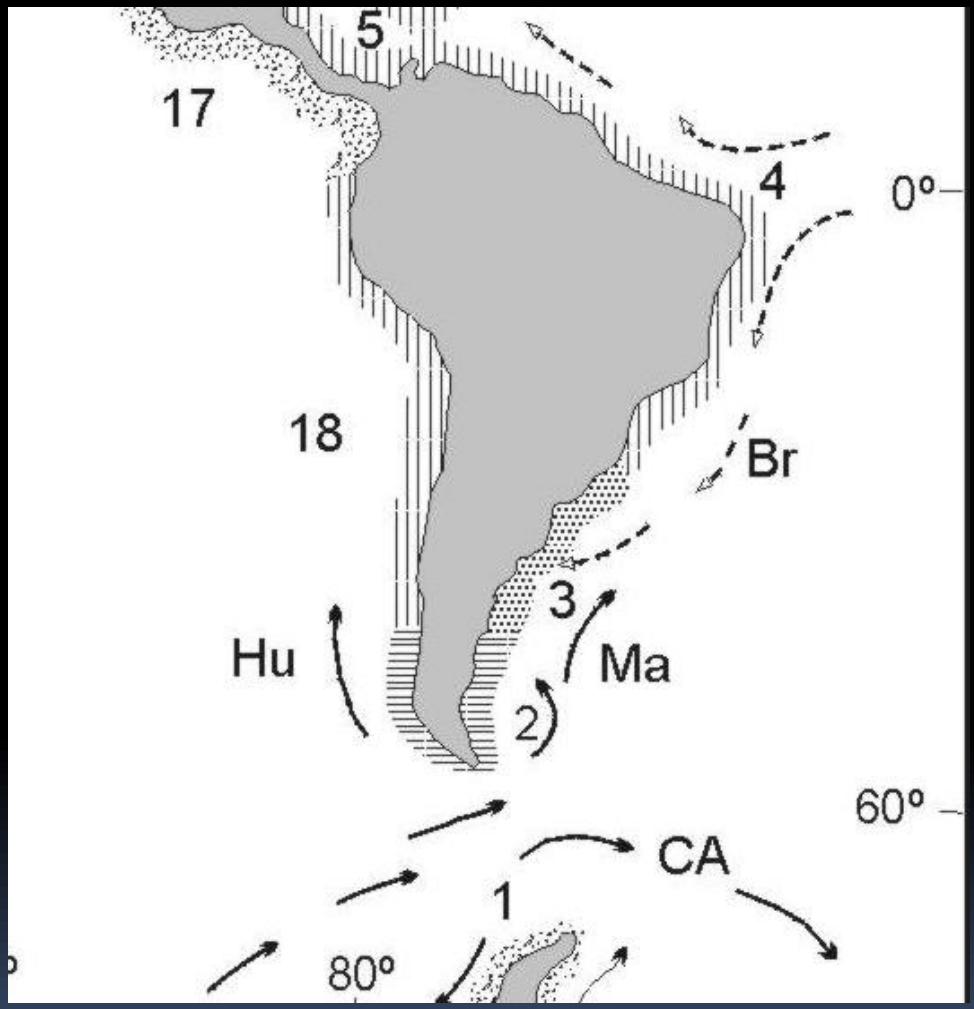
Ejemplo 1 Pérmico



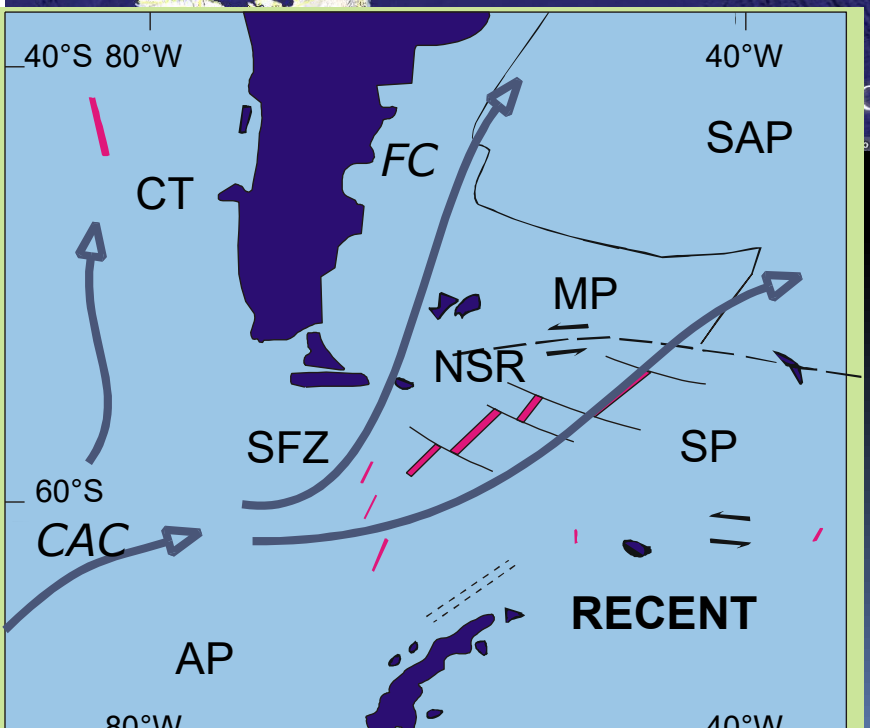
Verbreitung von Fossilien über die südlichen Kontinente von Pangaea

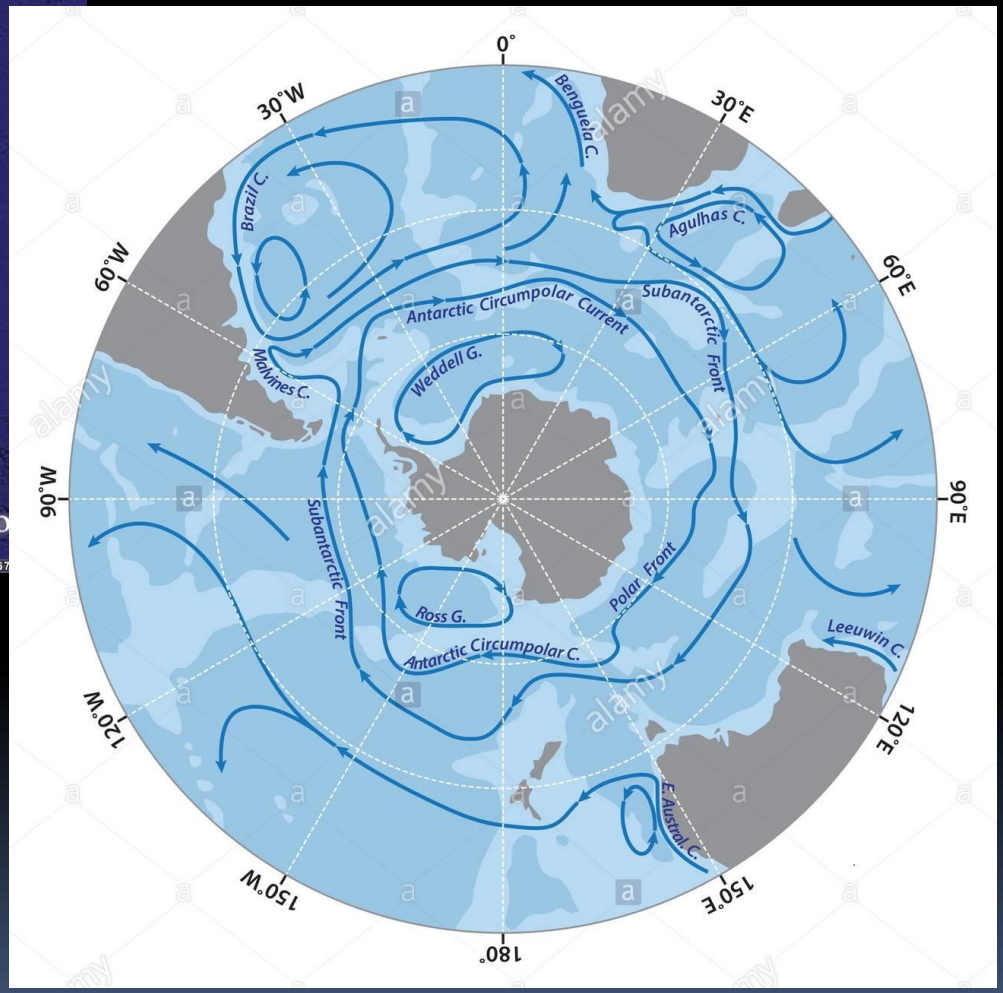


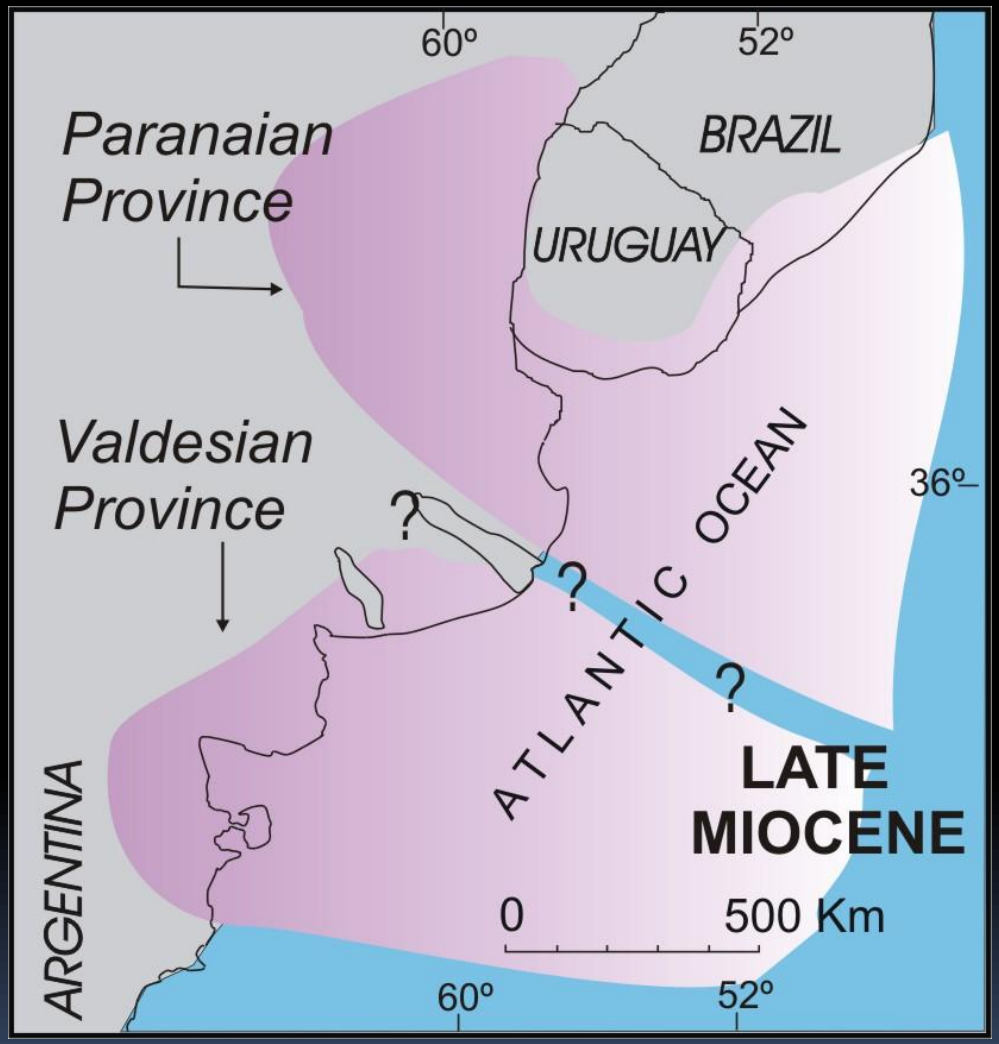
Ejemplo 2
Mioceno tardío El mar entrerriense

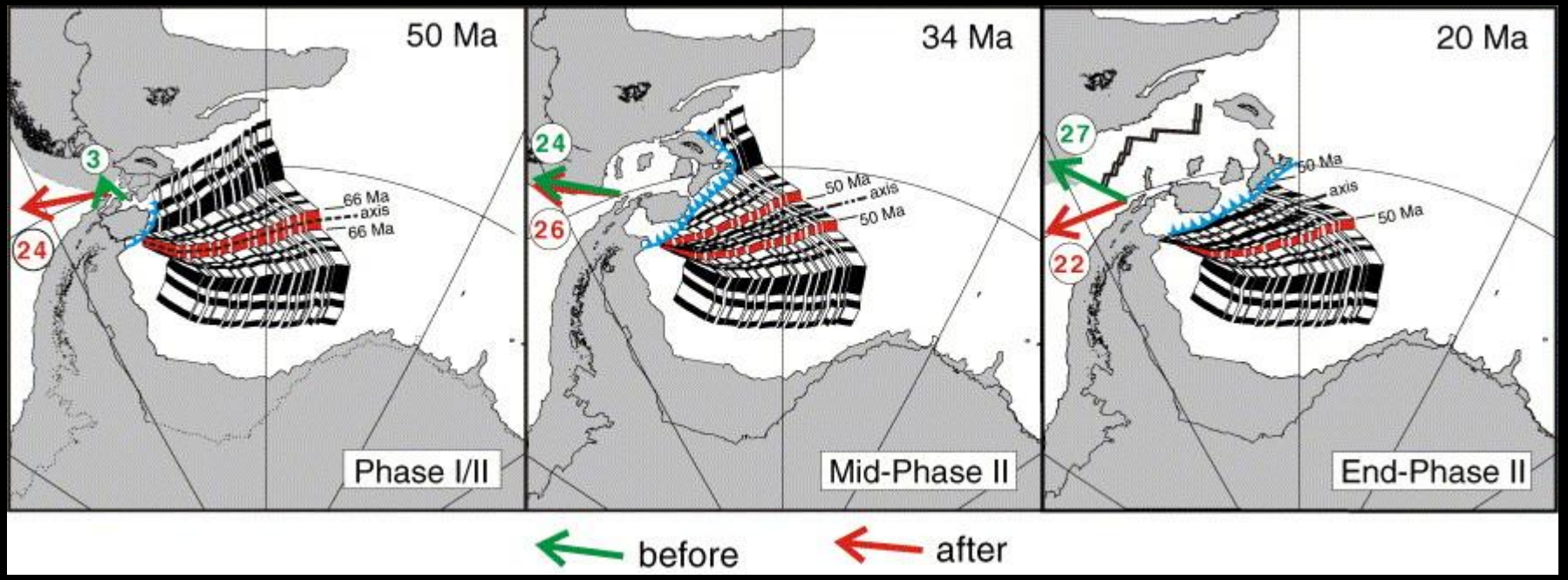

5
17
4
0º
18
Br
3
Hu
Ma
2
60º
CA
1
80º

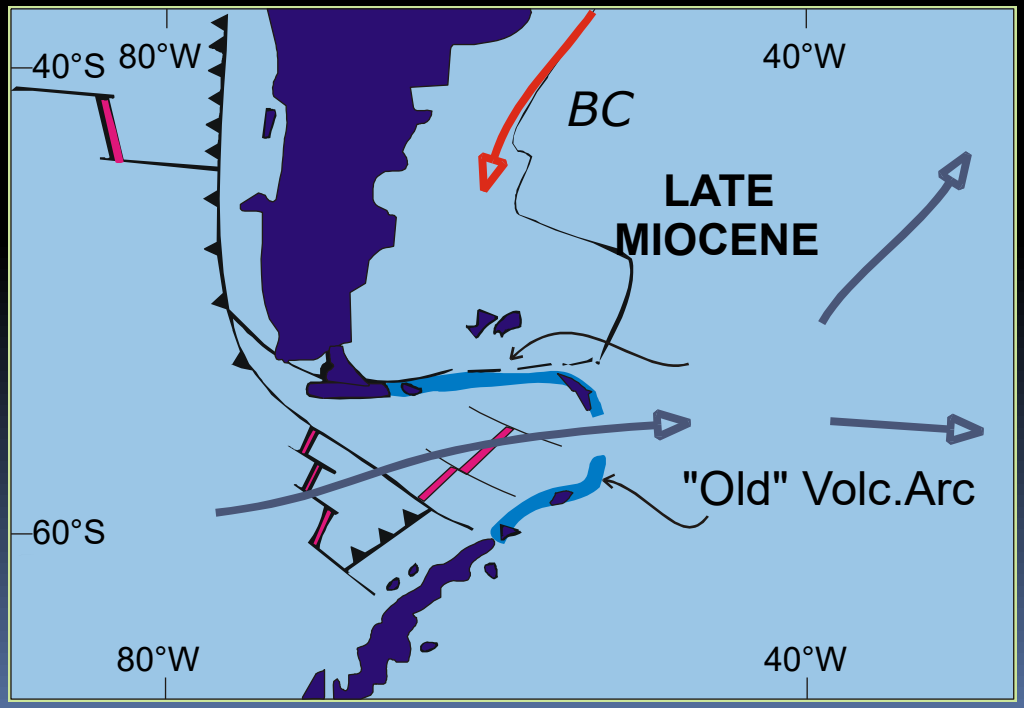

Argentina
Islas Falkland (Islas Malvinas)
Islas Georgia del Sur y Sandwich del Sur


40°S 80°W
40°W
60°S
80°W
40°W
CT
FC
SAP
MP
NSR
SFZ
SP
CAC
RECENT
AP

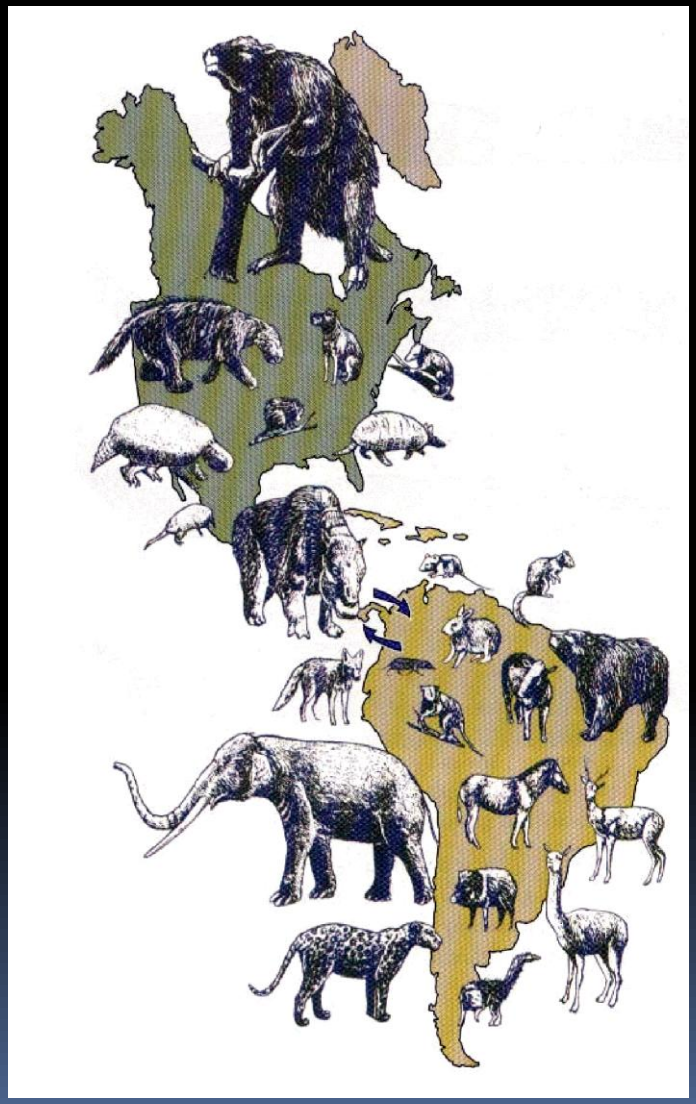

0°
30°W
30°E
60°W
60°E
90°W
90°E
120°W
120°E
150°W
150°E
180°
Benguela C.
Brazil C.
Agulhas C.
Antarctic Circumpolar Current
Subantarctic Front
Weddell G.
Malvines C.
Subantarctic Front
Polar Front
Ross G.
Antarctic Circumpolar C.
Leeuwin C.
E. Australi C.


60º
52º
Paranaian Province
BRAZIL
URUGUAY
Valdesian Province
?
?
?
ATLANTIC OCEAN
36º
ARGENTINA
LATE MIOCENE
0
500 Km
60º
52º

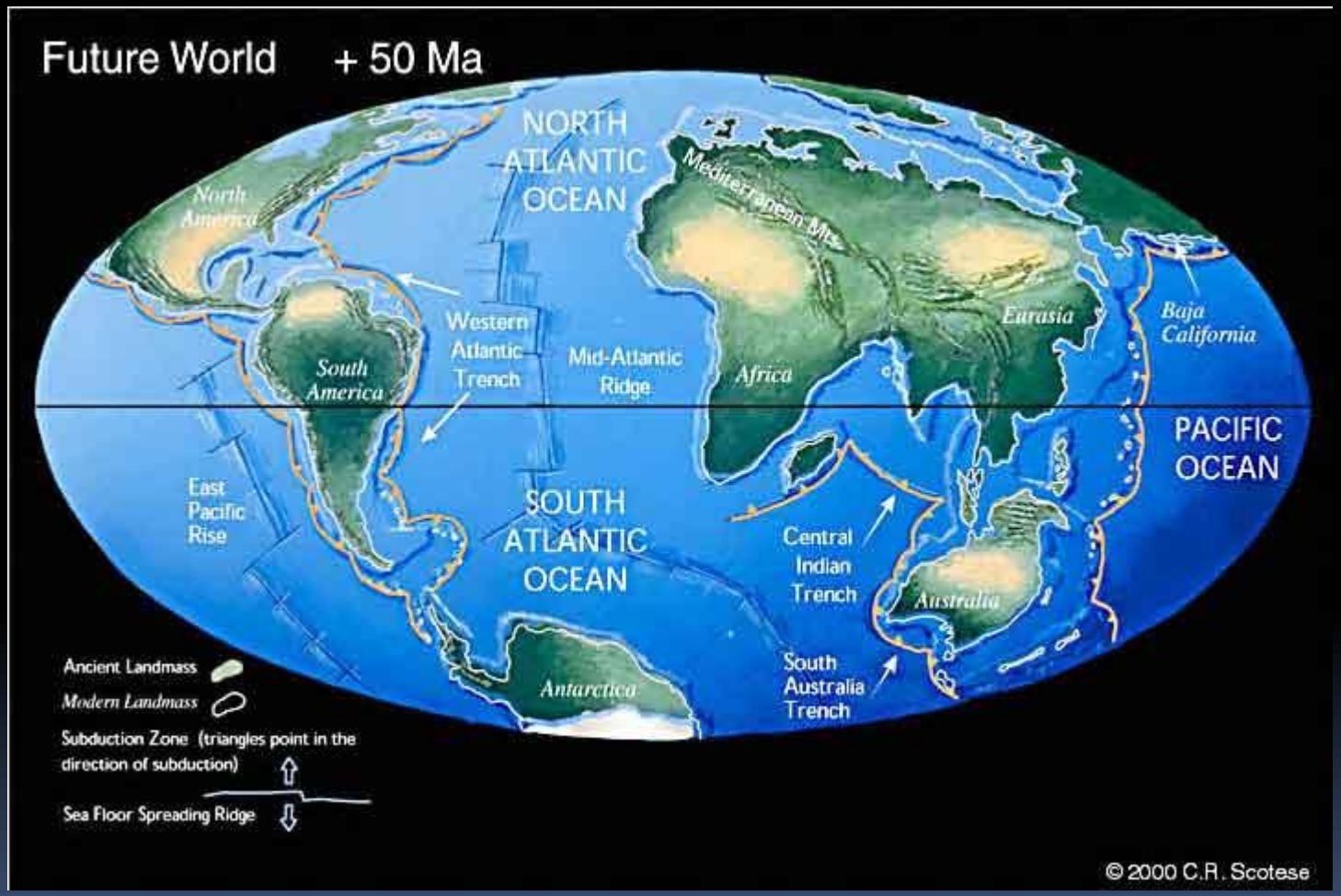

50 Ma
34 Ma
20 Ma
3
24
66 Ma
axis
66 Ma
24
26
50 Ma
axis
50 Ma
27
22
50 Ma
axis
50 Ma
Phase I/II
Mid-Phase II
End-Phase II
before
after


40°S
80°W
40°W
BC
LATE
MIOCENE
"Old" Volc.Arc
60°S
80°W
40°W

Ejemplo 3
GRAN INTERCAMBIO BIÓTICO AMERICANO



Plio-Pleistoceno


Future World + 50 Ma
NORTH ATLANTIC OCEAN
North America
Mediterranean Mts.
Eurasia
Baja California
Western Atlantic Trench
Mid-Atlantic Ridge
South America
Africa
PACIFIC OCEAN
East Pacific Rise
SOUTH ATLANTIC OCEAN
Central Indian Trench
Australia
Antarctica
South Australia Trench
Ancient Landmass
Modern Landmass
Subduction Zone (triangles point in the direction of subduction)
Sea Floor Spreading Ridge
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