

Chapter 16

Early Mesozoic Era

1

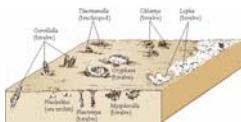
Early Mesozoic



- Bounded by mass extinctions
- Recovery from Permian mass extinction of:
 - Fusulinids
 - Lacy bryozoans
 - Rugose Corals
 - Trilobites

2

Early Mesozoic Life



- Mollusks are abundant
 - Ammonoids
 - 2 genera diversity to 100
 - Stromatolites returned to shallow water
 - Bivalves abundant
 - Sea urchins

3

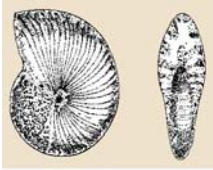
Early Mesozoic Life



- Reefs
 - Hexacorals
 - Dominant reef builder
 - Some resemble rugose corals

4

Early Mesozoic Life



- Pelagic Realm
 - Dinoflagellates
 - Calcareous nannofossils
 - Ammonoids
 - Rapid evolution
 - 1 m.y. range



5

Early Mesozoic Life



- Belemnoids
 - Squid-like relatives of Ammonoids
- Ammonoids were important guide fossils



6

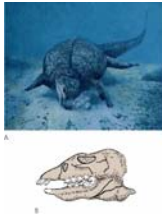
Early Mesozoic Life



- Fishes
 - More modern- like
 - Scales covered bodies
 - Skeletons of cartilage
 - Simple jaws
 - Peg-like teeth

7

Early Mesozoic Life



- Marine reptiles
 - Placodonts
 - Blunt toothed shell crushers
 - Broad armored bodies

8

Early Mesozoic Life



- Marine reptiles
 - Nothosaurs
 - Early Triassic
 - May be first marine reptiles

9

Early Mesozoic Life



- Plesiosaurs
 - Evolved from nothosaurs

10

Early Mesozoic Life



- Ichthyosaurs
 - Fish lizards
 - Bore live young

11

Early Mesozoic Life on Land



A



B

- Tree-forming Gymnosperms
 - Cycads
 - Cycadeoids
 - Ginkgos

12

Early Mesozoic Life on Land



- Mesozoic forests looked very different from modern forests

13

Early Mesozoic Life on Land



- Early Mammals
 - Mammals evolved from therapsids
 - Small
- Thecodonts
 - Dinosaur ancestors
 - Upper portion of legs extended downward rather than sprawling

14

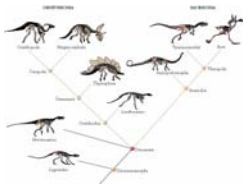
Early Mesozoic Life on Land



- Thecodont descendents
 - Dinosaurs
 - Bipedal
 - Different skull
 - More highly developed teeth
 - Crocodiles

15

Early Mesozoic Life on Land



- Dinosaur evolution
 - Bird-hipped
 - herbivores
 - Lizard-hipped
 - Herbivores
 - Carnivores

16

Early Mesozoic Life on Land



- Sauropods
 - Largest of all dinosaurs
- Morrison Formation

17

Early Mesozoic Life on Land



- *Allosaurus*
 - Largest carnivore

18

Early Mesozoic Life on Land



- Pterosaurs
 - Long wings
 - Hollow bones
 - Flight

19

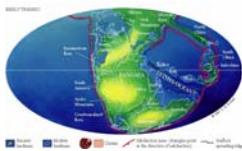
Early Mesozoic Life on Land



- *Archaeopteryx*
- Missing link
 - Feathered
 - Breastbone

20

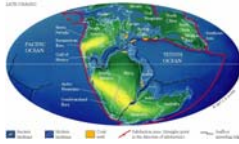
Paleogeography



- Pangea began to separate

21

Paleogeography



- Tethys seaway formed
 - Site of modern Mediterranean

22

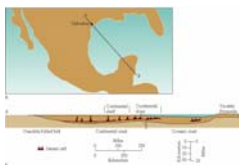
Paleogeography



- Rifting began first in north, then to south

23

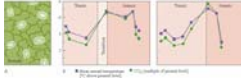
Paleogeography



- Salt domes
 - Thick evaporites built up in modern Gulf of Mexico
 - Formed salt domes
 - Petroleum reserves

24

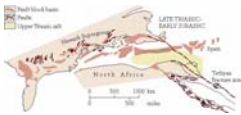
Triassic Mass Extinction



- Global warming
 - Volcanic activity released high volumes of CO₂
 - Number of leaf stomates increased
 - Cells that utilize CO₂

25

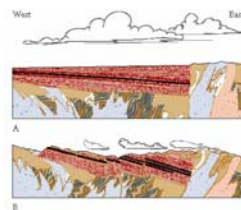
Tectonic Events-Eastern U.S.



- Rifting created fault basins
 - Evaporites accumulated as seawater leaked into basin

26

Tectonic Events-Eastern U.S.



- Basins
 - Filled with clastic sediments
 - Arkose rich
 - Rapid deposition

27

Tectonic Events-Eastern U.S.



- Palisades Sill
 - Mafic intrusion associated with rifting
 - Near NYC

28

Tectonic Events-Western U.S.



- Petrified Forest
 - Chinle formation
 - Utah and Arizona

29

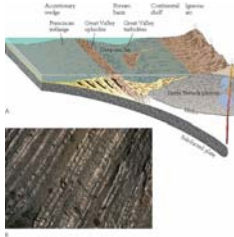
Tectonic Events-Western U.S.



- Sundance Sea
 - Global sea level rise
 - Pacific flooded western US

30

Tectonic Events-Western U.S.



- Additional accretion
 - Accretionary wedge
 - Franciscan rocks
 - Great Valley turbidites

34

Tectonic Events-Western U.S.



- Sundance Sea
 - Retreated as it filled with sediments
 - No flysch deposition
 - Significant molasse
 - Morrison Formation

35

Dinosaurs



- Morrison Formation
 - Excavation of dinosaur fossils

36

Dinosaurs



- *Parasaurolophus*
 - 3 m long
 - Resonating chamber

37

Dinosaurs



- *Maiosaura* hatchling
 - 50 cm long

38

Dinosaurs



- *Oviraptor*
 - Egg stealer
 - 0.7 m

39

Dinosaurs



- *Protoarchopteryx*
 - Precursor of feathers
 - 60 cm

40

Dinosaurs



- *Protoarchaeopteryx*
 - Fossilized tail feathers

41

Era	Period	Time
Cenozoic	Quaternary	
	Neogene	
Mesozoic	Cretaceous	65 million years ago
	Jurassic	150 million years ago
	Triassic	200 million years ago
	Permian	250 million years ago
	Carboniferous	
	Devonian	
	Silurian	
	Ordovician	
	Cambrian	
	Paleozoic	Permian
Carboniferous		
Precambrian	Proterozoic	
	Azoic	

42

