XIII. Phanerozoic - Middle Paleozoic (chapter 14)

A. Introduction - Middle Paleozoic = Silurian & Devonian

B. S-D Paleogeography & PT (pp. 331, 345-354)

1. Locations & movements of continents
   a. Laurentia

   b. Baltica

   c. Siberia

   d. Gondwana

2. Taconic Orogeny finishes up

3. Acadian Orogeny (Avalon collided with Laurentia)

4. Caledonian Orogeny (Baltica collided with Laurentia)

5. Laurussia (= Euramerica) (= Old Red Sandstone Continent)

6. Antler Orogeny (western North America)

C. Sea level & climate (pp. 331, 345-347)

1. High sea level, but lower than in the Ordovician

2. Major regression in Early Devonian

3. ~Warm in Silurian-Devonian

4. Late Devonian glaciation

D. Some S & D rocks (pp. 345-354)

1. Widespread Silurian limestone/dolostone/reef/evaporite deposits

2. Major unconformity in N.Am. & clean sandstone usu. just above

3. Devonian fossiliferous limestones common

4. Catskill Delta

5. After orogenies, lots of black shales (~globally)

E. S & D life/fossils (pp. 64-67, 330, 332-345, 348-349)

1. After end-Ordovician extinction → big adaptive radiation
2. Silurian = "Age of Corals" & Devonian = "Age of Fishes"
3. Widespread S-D reefs

a. Reef builders - tabulate & rugose corals, stromatoporoids

b. Reef & inter-reef dwellers - brachiopods, bryozoans, crinoids, trilobites, molluscs

4. Nektic animals

a. Eurypterids

b. Ammonoid cephalopods

c. Jawless Fish

d. 1st Jawed Fish (O - not important until D)

i. Origin & history of vertebrates

a) Characteristics of Phylum Chordata

b) Echinoderm origins?

c) Tunicates (Subphylum Urochordata)

d) Lancelet (Subphylum Cephalochordata)

e) Vertebrates (Subphylum Vertebrata)

f) Earliest chordate & vertebrate fossils

i) Chengjiang & Burgess Shale

ii) 1st vertebrate bone in Late Cambrian

iii) Conodonts

ii. 1st jaws & 1st scales

iii. 1st acanthodians

iv. 1st placoderms (mostly predators)

v. 1st bony fish

vi . 1st sharks (no bones) & 1st lungfish in Devonian

5. 1st land plant body fossils (S) & 1st forests (D)

a. Land plants evolved from freshwater green algae

b. <u>Vascular tissues</u> provide support, transport nutrients & water

c. ~10 m tall trees in forests in Late Devonian

6. 1st land animals

a. 1st land invertebrates (Silurian) (C-O ?)

b. 1st amphibians (1st tetrapods) (Late Devonian)

i. Evolved from rhipidistian bony fish

ii. *Eusthenopteron*

Tiktaalik

Panderichthys-Acanthostega-Ichthyostega

iii. Why move to land?
a) Drought
b) Food resources
c) Escape from predators
d) Better eyesight
iv. Anatomy & problems with life on land
a) Breathing air (need lungs)

b) 3-chambered heart
c) Desiccation

d) Reproduction

e) Mobility

f) Support (stronger backbones, stouter limbs, stronger shoulder/pelvic girdles)
g) Need access to water

h) Sensing the environment

7. Important lagerstätten

a. Hunsrück Slate (Dev.)

b. Rhynie Chert (Dev.)

8. Frasnian-Famennian mass extinction (pp. 348-349)

a. Hit reef-builders hard

b. Cause(s)?