

Introduction to Biology. Lecture 18

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Outline

- 1 Questions and answers
 - Where we are?
- 2 Cambrian period
 - Life in Cambrian
 - Cambrian explosion of skeletal fauna

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Questions and answers

Where we are?

Timescale of Phanerozoic eon, Paleozoic era

- Phanerozoic eon
 - Paleozoic era
 - Cambrian period: 541 Mya
 - Ordovician period: 485 Mya
 - Silurian period: 443 Mya
 - Devonian period: 419 Mya
 - Carboniferous period: 358 Mya
 - Permian period: 299–252 Mya



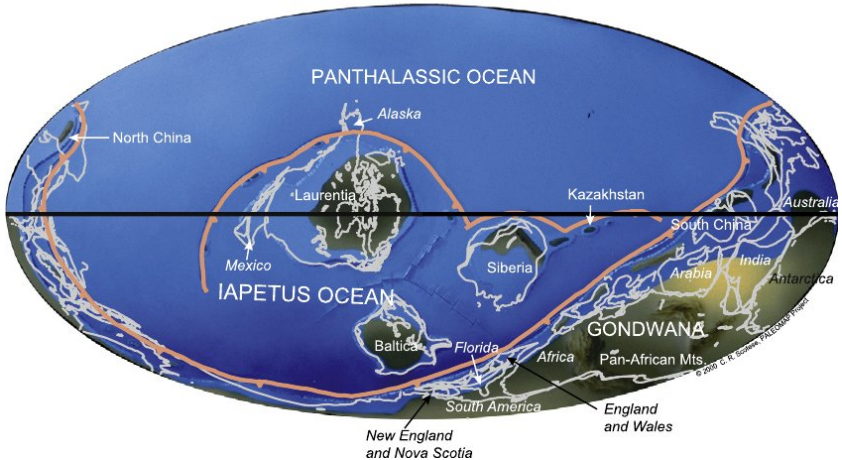
Cambrian period

Life in Cambrian



Cambrian map

514 Ma Cambrian



Cambrian climate

- Gradually changed from colder to warmer
- Polar ice caps were most probably present



Main Cambrian biotas

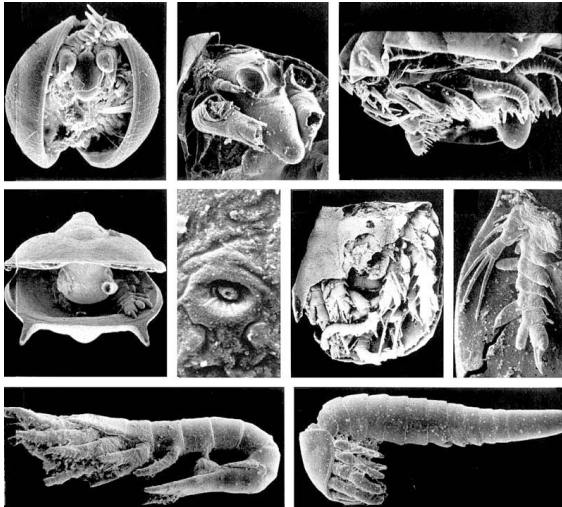
- Burgess shale (505 Mya)
- Orsten fauna (498 Mya)
- These fossils were kept in Lagerstaettes—exceptionally well preserves clay deposits
- This excellent preservation could be consequence of the rarity of Cambrian destroyers



Burgess shale



Orsten fauna



Cambrian period

Cambrian explosion of skeletal fauna

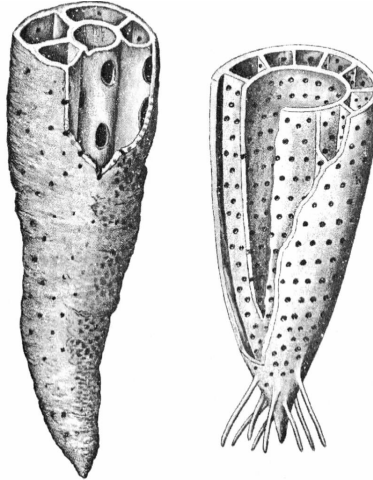


Life in Cambrian



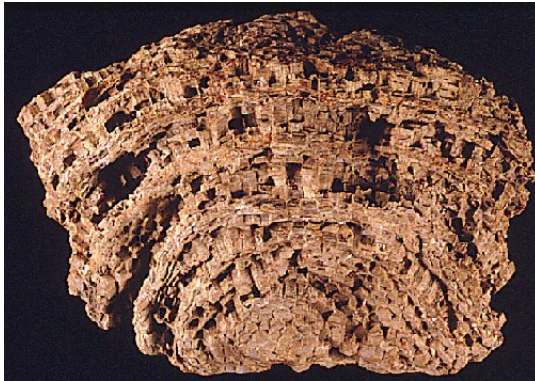
This is the picture of famous Czech artist Zdenek Burian

Archaeocyaths (most probably sponges)



Most probably, Archaeocyaths were sponges

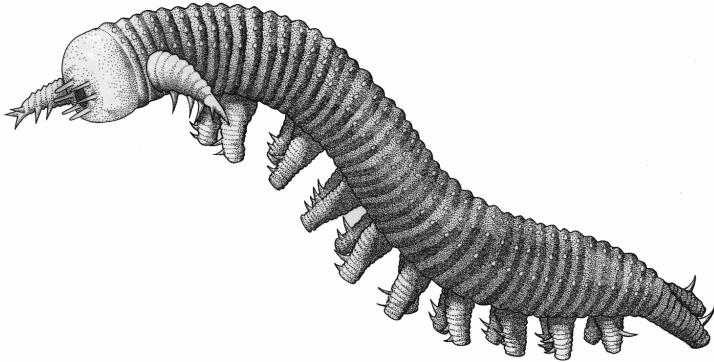
Cnidaria



Tabulate coral



Lobopod worms



This is *Aysheaia*

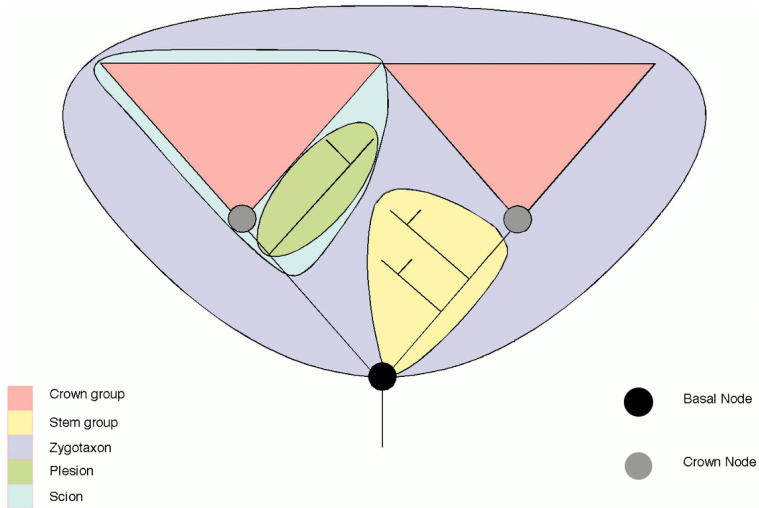
Our *Hallucigenia* is also a lobopod worm!



Stem Arthropods



Stem and crown groups

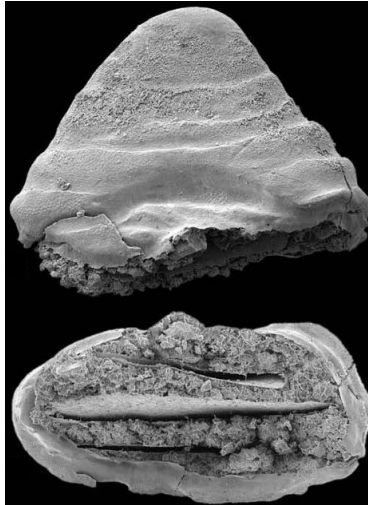


Mollusks: naked



Odontogriphus – stem naked mollusk

... and shelled

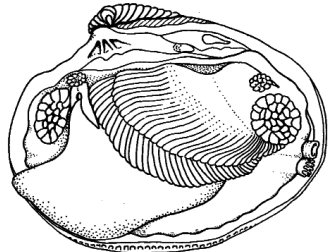
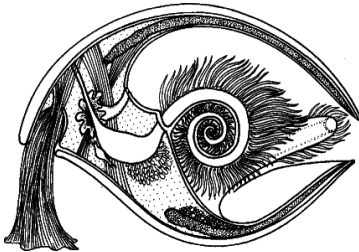


Helcionellid shell-bearing mollusk from Greenland

Brachiopods



Brachiopods are not mollusks!



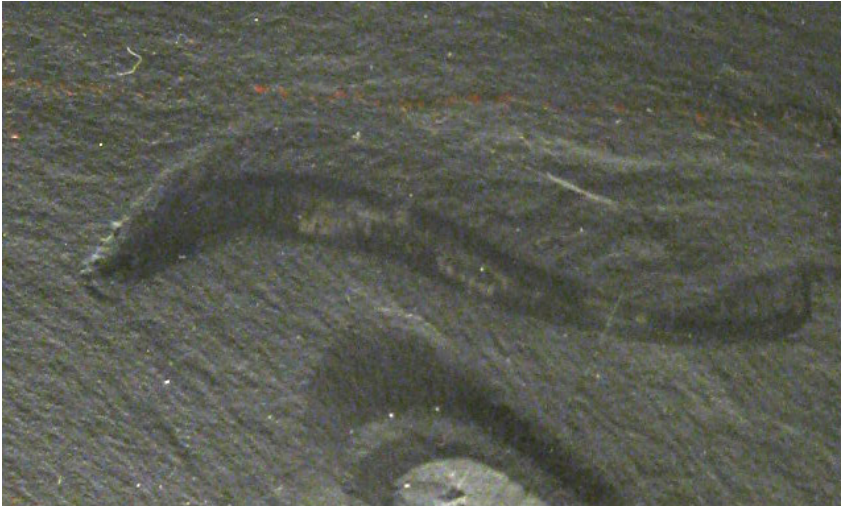
Brachiopoda (left) are completely different internally from bivalve mollusks (right)

Echinoderms



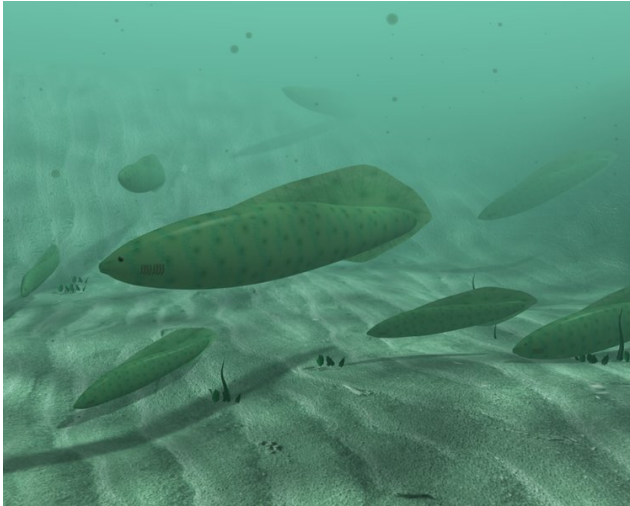
Sea lily *Gogia* from Nevada

Soft-bodied chordates



Pikaia from Burgess shale

First fish-like animals: craniate *Haikouichthys*

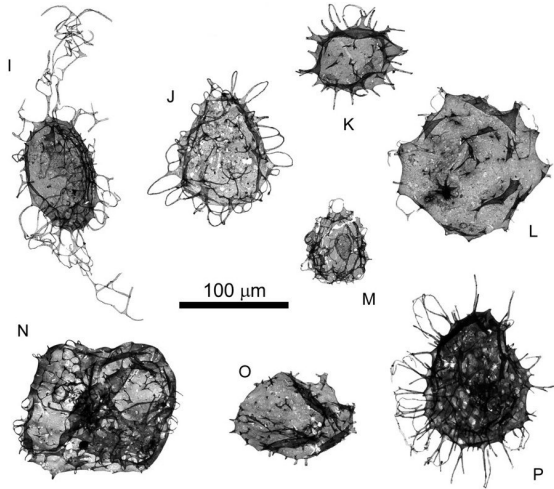


Algae



Yuknessia is a fossil green alga from Utah

Fungi



Tappania fungus was known even before Cambrian

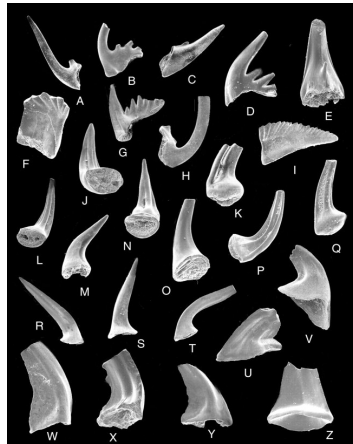


Problematics: *Aldanophyton*



Terrestrial plant? Or alga?

Problematics: conodonts



Conodonts are just teeth of unknown animal, it is still not clear what was it. Jawless fish?

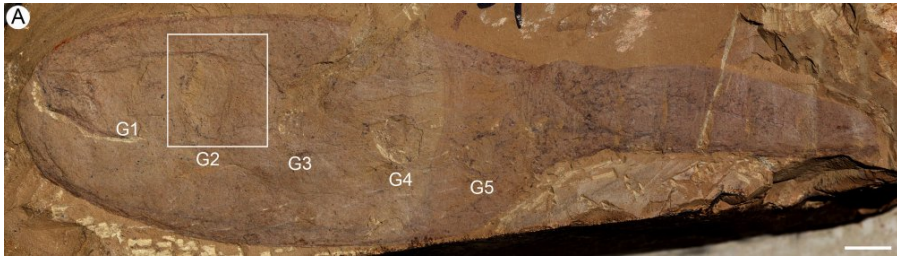


Problematics: hyoliths



Haplophrentis, mollusk? Or separate branch on the tree of life?

Problematics: vetulicolians



Ancestors of both echinoderms and chordates?

Theories of Cambrian explosion

- Pellet revolution
- Acquiring the ability of making hard tissues
- Absolute predator



Summary

- Cambrian period started with massive appearance of skeletal fauna: “Cambrian explosion”



For Further Reading



Cambrian explosion.

http:

[//en.wikipedia.org/wiki/Cambrian_explosion](http://en.wikipedia.org/wiki/Cambrian_explosion)

