

Introduction to Biology. Lecture 18

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October 17, 2014



- 1 Where we are?
 - Cells, tissues, kingdoms and viruses

- 2 Cambrian period
 - Life in Cambrian
 - Cambrian explosion of skeletal fauna



1 Where we are?

- Cells, tissues, kingdoms and viruses

2 Cambrian period

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- Cambrian explosion of skeletal fauna

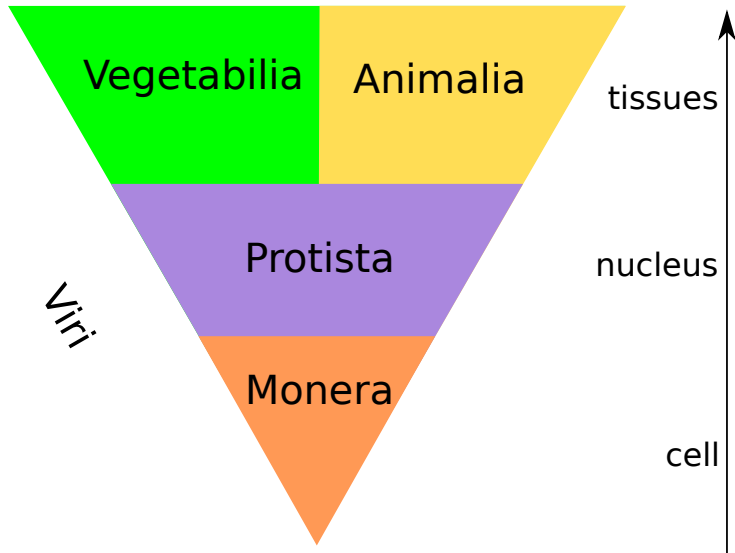


Where we are?

Cells, tissues, kingdoms and viruses



Cells, tissues, kingdoms and viruses



Cambrian period

Life in Cambrian



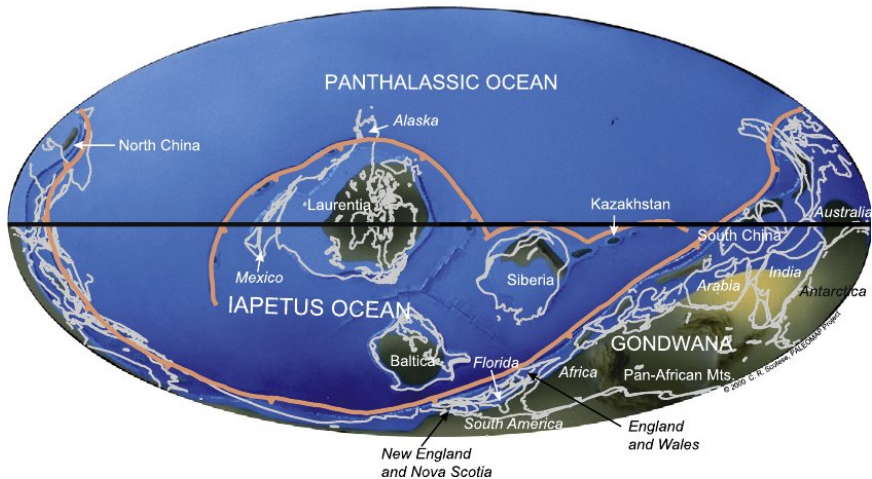
Timescale of Phanerozoic eon, Paleozoic era

- 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 map

514 Ma Cambrian



Cambrian climate

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



Main Cambrian biotas

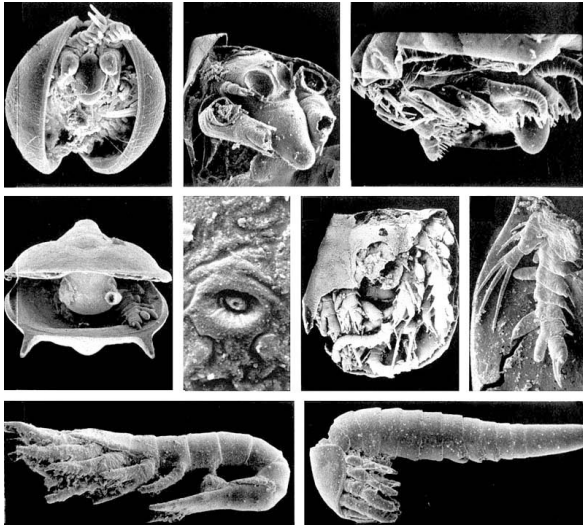
- Burgess shale (505 Mya)
- Orsten fauna (498 Mya)
- These fossils were kept in Lagerstaettes—exceptionally well preserves clay deposits
- This excellent preservation could be consequence of the rarity of Cambrian destroyers



Burgess shale



Orsten fauna



Cambrian period

Cambrian explosion of skeletal fauna



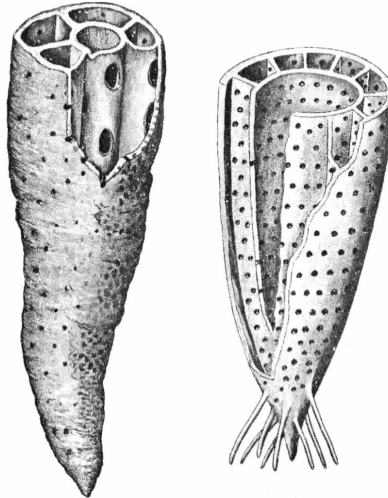
Life in Cambrian



This is the picture of famous Czech artist Zdenek Burian



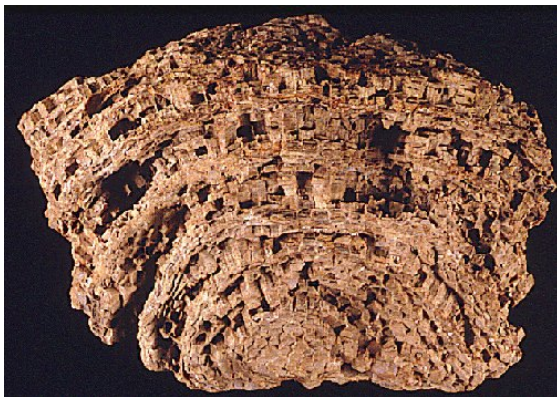
Archaeocyaths (most probably sponges)



Most probably, Archaeocyaths were sponges



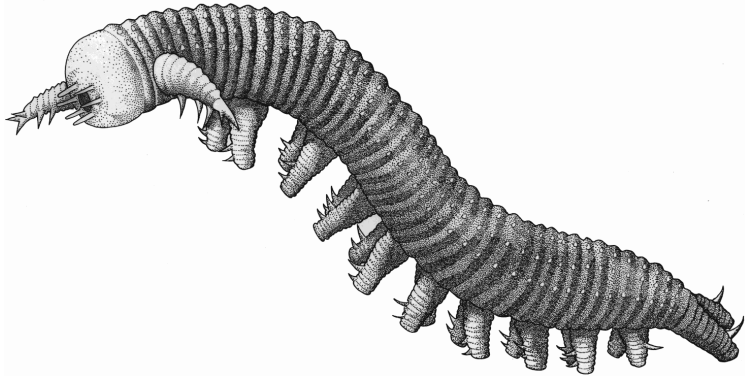
Cnidaria



Tabulate coral



Lobopod worms



This is *Aysheaia*

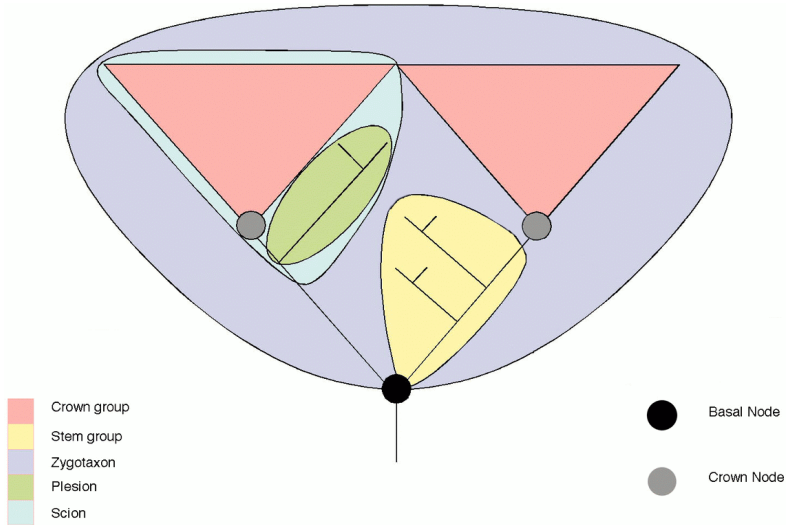
Our *Hallucigenia* is also a lobopod worm!



Stem Arthropods



Stem and crown groups



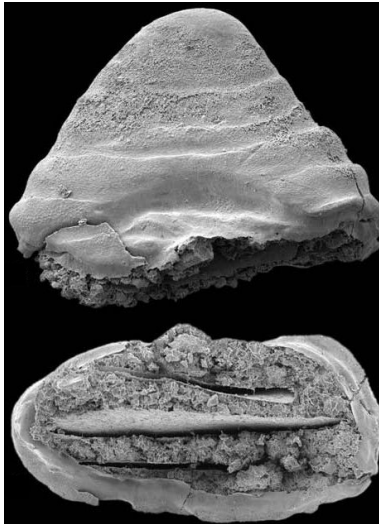
Mollusks: naked



Odontogriphus – stem naked mollusk



... and shelled



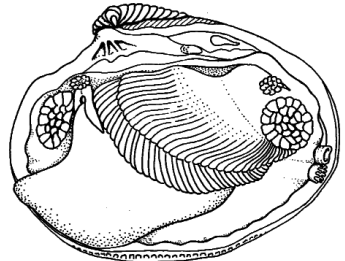
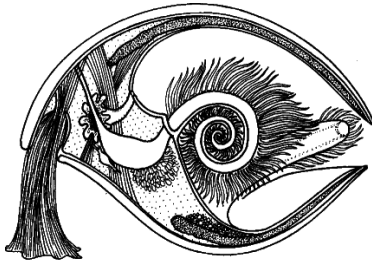
Helcionellid shell-bearing mollusk from Greenland



Brachiopods



Brachiopods are not mollusks!



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

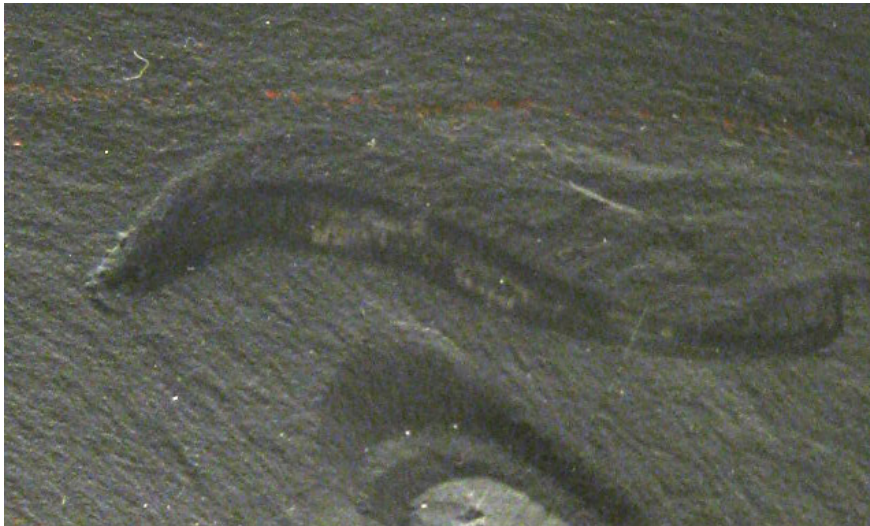
Echinoderms



Sea lily *Gogia* from Nevada



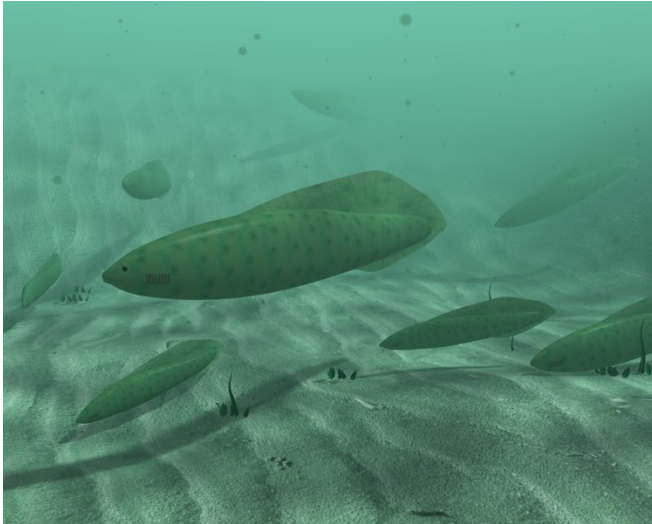
Soft-bodied chordates



Pikaia from Burgess shale



First fish-like animals: craniate *Haikouichthys*



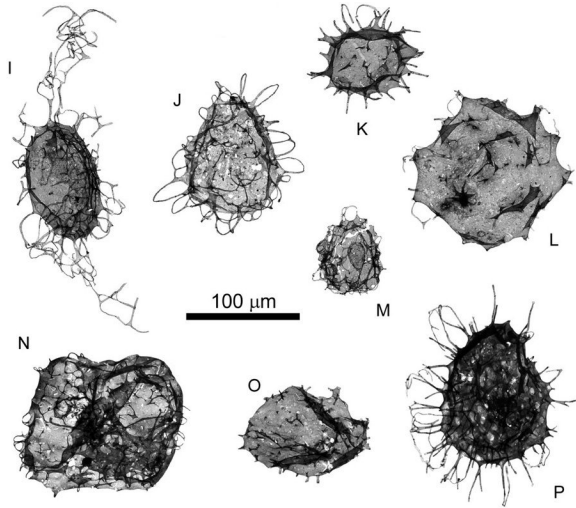
Algae



Yuknessia is a fossil green alga from Utah



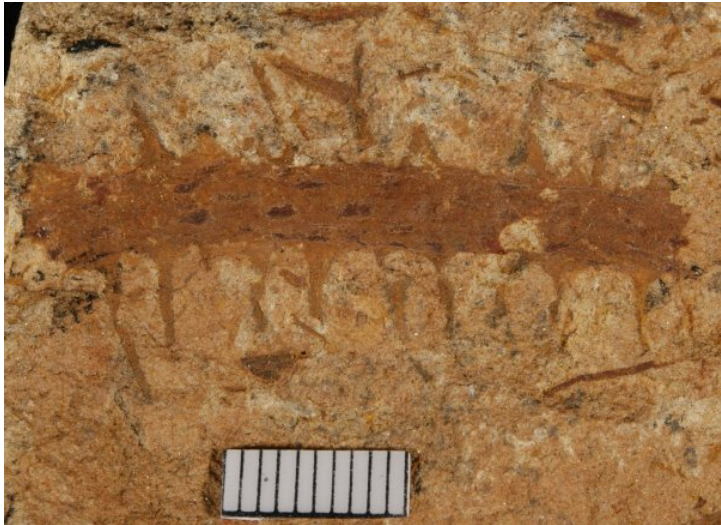
Fungi



Tappania fungus was known even before Cambrian



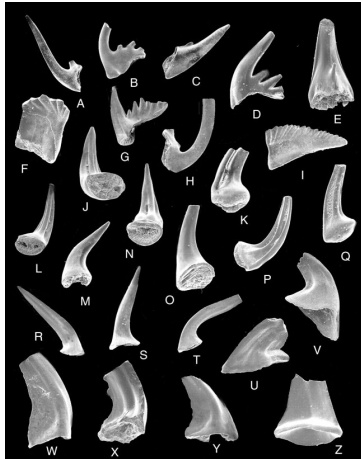
Problematics: *Aldanophyton*



Terrestrial plant? Or alga?



Problematics: conodonts



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



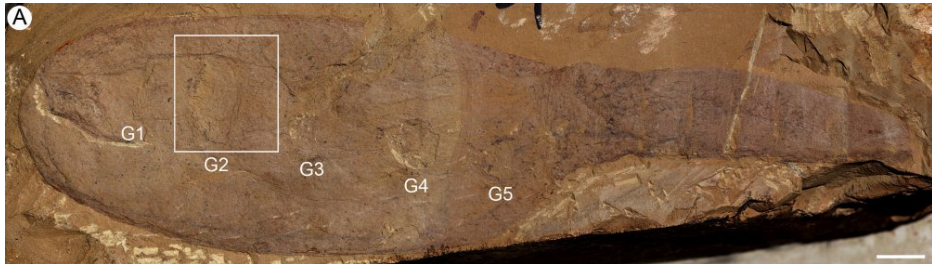
Problematics: hyoliths



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



Problematics: vetulicolians



Ancestors of both echinoderms and chordates?

Summary

- Introns, linear DNA molecules and telomere/telomerase system differ eukaryotes from most prokaryotes
- Cambrian period started with massive appearance of skeletal fauna: “Cambrian explosion”



For Further Reading



Introns.

<http://en.wikipedia.org/wiki/Intron>



Cambrian explosion.

http://en.wikipedia.org/wiki/Cambrian_explosion

