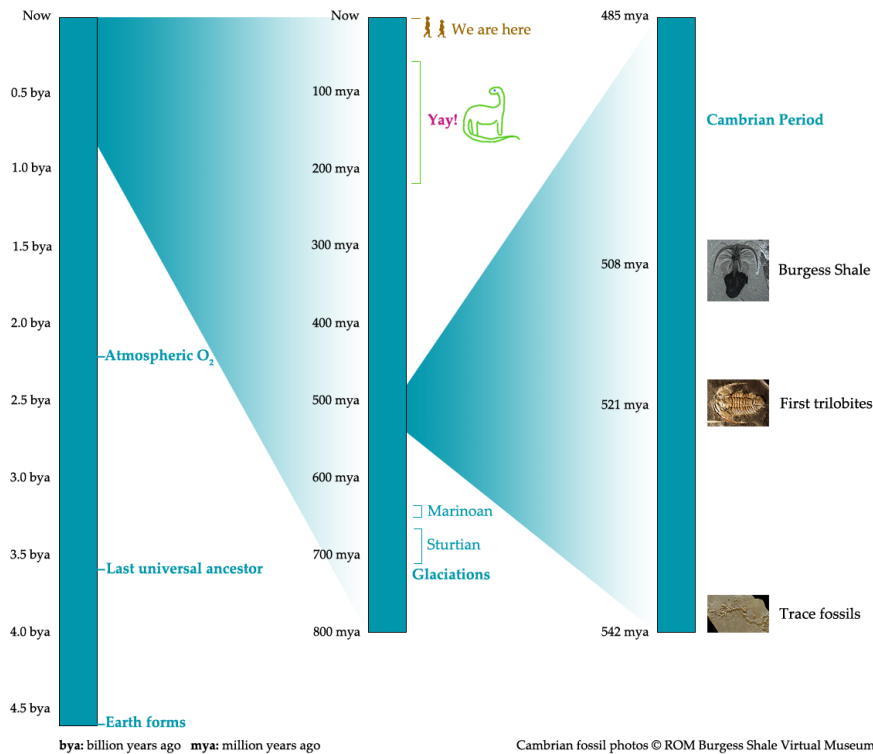


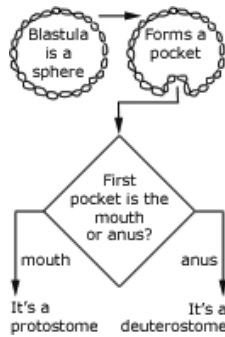
# Travels of a Darwin Groupie: Life Before Dinosaurs



## Timeline

- c. 13,000 BC-A sagacious rock-shelter resident at Arcy-sur-Cure drills holes in a trilobite to wear it as an amulet.
- 1698-Edward Lhwyd publishes a description of a "flatfish" in *Philosophical Transactions of the Royal Society*.
- 1774-J.S. Schroeter publishes a depiction of trilobite legs and gets them completely wrong.
- 1876-C.D. Walcott becomes the first person to describe actual trilobite legs.
- 1886-A. Ficatier describes the trilobite perforated around 13,000 BC.
- 1892-An *Anomalocaris* appendage from the Burgess Shale is mistaken for a shrimp.
- 1902-Richard Woodward conjures a head for a supposed shrimp butt, but it's really an *Anomalocaris* appendage.
- 1909-Walcott begins digging in the Burgess Shale.
- 1928-K.L. Henriksen glues an *Anomalocaris* appendage to an unrelated fossil to make an odd shrimp.
- 1946-Geologist Reg Sprigg discovers fossils near Australia's Ediacara Hills.
- 1954-Brian Logan and geologist friends find living stromatolites in Shark Bay.
- 1966-Harry Whittington, Derek Briggs and Simon Conway Morris begin reexamining Burgess Shale fossils.
- 1972-Whittington shows a preliminary reconstruction of *Opabinia* at a Palaeontological Association meeting, and the crowd roars with laughter.
- 1977-Conway Morris interprets *Hallucigenia* upside down and backwards, with spiky legs and a bulbous head.
- 1978-1979-Conway Morris and Briggs demonstrate that *Anomalocaris* pieces really belong to one animal.
- 1989-Stephen Jay Gould publishes *Wonderful Life*.
- 2004-M.-Y. Zhu and coauthors describe munched trilobite parts inside another arthropod.
- 2015-Martin Smith and Jean-Bernard Caron describe the actual head of *Hallucigenia*, and explain the awkward fact that what had long been mistaken for its head was decay fluid squished out of its indelicate end.

## Erudite Insults



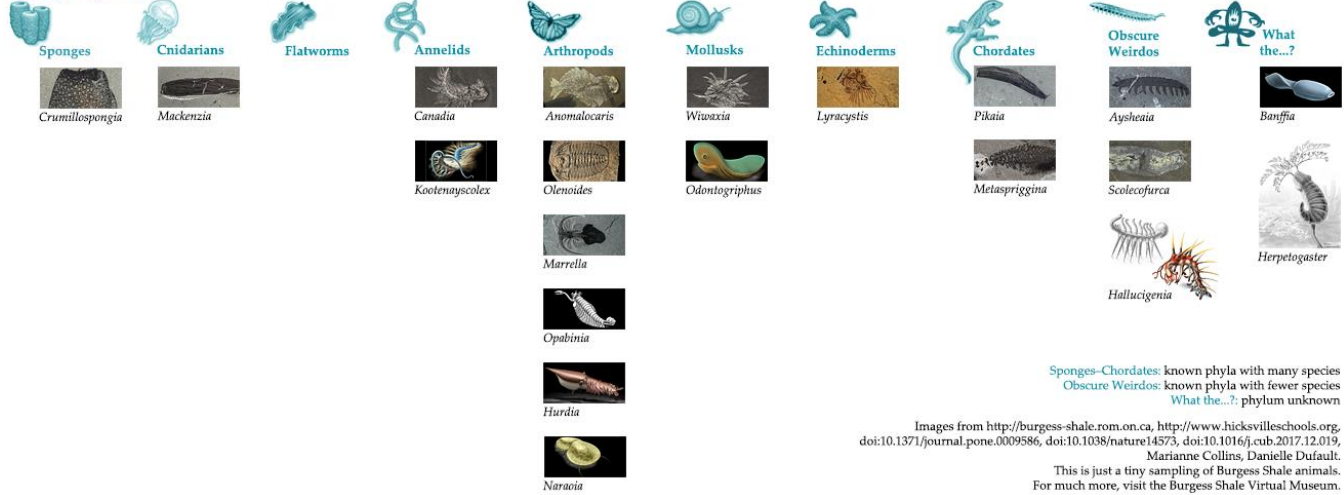
- "You are a complete early-stage deuterostome."
- "You remind me of *Hallucigenia*'s head as envisioned by Simon Conway Morris circa 1977."
- "That outfit makes you look as ludicrous as *Herpetogaster*."
- "A *Dickinsonia* could provide a more informed, intelligent analysis than your blog."
- "Stromatolites ruled the world for less time than you've yammered about your impending root canal."
- "You're such a narcissist, you probably reproduce like *Fractofusus*."

## Useful URLs

- Burgess Shale Virtual Museum: <http://burgess-shale.rom.on.ca/en/> (**highly recommended**)
- The Dawn of Life: <http://www.theglobeandmail.com/technology/science/500-million-years-ago-this-critter-had-a-bad-day/article22984858/> (highlights Marble Canyon fossil site)
- How to make a paper *Wiwaxia*: <http://www.jade.dti.ne.jp/~zardoz/papercraft/wiwaxia/index.html>
- How to make a chocolate trilobite: [https://www.youtube.com/watch?v=\\_iEODmXVdUg](https://www.youtube.com/watch?v=_iEODmXVdUg)

## Selected Burgess Shale Fossils at the Royal Ontario Museum, Toronto

### Likely Phylum



Sponges-Chordates: known phyla with many species  
Obscure Weirdos: known phyla with fewer species  
What the...?: phylum unknown

Images from <http://burgess-shale.rom.on.ca>, <http://www.hicksvilleschools.org>,  
doi:10.1371/journal.pone.0009586, doi:10.1038/nature14573, doi:10.1016/j.cub.2017.12.019,  
Marianne Collins, Danielle Dufault.  
This is just a tiny sampling of Burgess Shale animals.  
For much more, visit the Burgess Shale Virtual Museum.

## Charles Doolittle Walcott



Left: Jean-Bernard Caron holds the identification card for a *Naraoia* fossil gifted by C.D. Walcott to the University of Toronto, now held at the Royal Ontario Museum.

**Organizations Walcott headed or helped found:** U.S. Geological Survey, Smithsonian Institution, National Academy of Sciences, National Advisory Committee for Aeronautics (forerunner of NASA).

**Walcott's research:** Studied *Cryptozoon* (later identified as stromatolites), discovered *Chuarina* (the first preserved Precambrian cellular organisms to be found), revealed and described trilobite

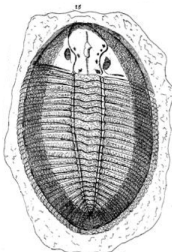
legs, collected some 65,000 fossils from the Burgess Shale. Richard Fortey writes that one could imagine Walcott recording in his journal, "Found Holy Grail this a.m.; have expectations of Excalibur tomorrow."

### PHILOSOPHICAL TRANSACTIONS:

Edw. Lhwyd  
Phil. Trans. 1698 20, 279-280, published 1 January 1698

IV. Part of a Letter from Mr. Edw. Lhwyd to Dr. Martin Lifter, Fell. of the Coll. of Phys. and R. S. concerning several regularly figured Stones lately found by him.

I Should have troubled you with some sort of Account of our Travels; which, as you'll find by the inclosed Draughts of figured Stones, has been tolerably successful. The 8, 9, and 15th we found near the *Lake Deile* in *Cotnamshire*; the 11, 13, 17, 19, on the *Severn Shore* in *Gloucestershire*; the 14th at *Gold Cliff* in *Monmouthshire*; and all the rest in the Isle of *Wales*, in this County. The 15th whereof we found great Plenty, must needs be referred to the *Stomach* of some fish; the 8th and 9th I know not as all what to make of; the rest are *Medusa* or *Periwinkle* or *Sea Stars*; nor I have been long since fully satisfied that all sorts of *Ensects* and *Asteria* must be refer'd thither; nor that I con-



## Earliest Formal Description of a Trilobite

Year: 1698

Author: Edward Lhwyd

Identification: "Skeleton of some flat fish" that likely swam on its side.

## World's Biggest Burgess Shale Collections

Smithsonian: ~65,000

Royal Ontario Museum: ~150,000

## Possible Emergence Times of Major Phyla

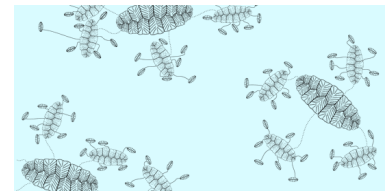
Before Snowball/Slushball Earth:

Sponges

Ediacaran Period: Cnidarians

Cambrian Period: Flatworms, Annelids, Arthropods, Mollusks, Echinoderms, Chordates

## Fractofusus's Dual Reproductive Strategy



1. Propagules. 2. Mini-me's.

Source: doi:10.1038/nature14646

Handout for a slideshows delivered Oct-28-2015 and Aug-11-2018  
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