Travels of a Darwin Groupie: Life Before Dinosaurs

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=_JEOdXVdUg

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.


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

### Likely Phylum

<table>
<thead>
<tr>
<th>Sponges</th>
<th>Cnidarians</th>
<th>Flatworms</th>
<th>Annelids</th>
<th>Arthropods</th>
<th>Mollusks</th>
<th>Echinoderms</th>
<th>Chordates</th>
<th>Obscure Weirdos</th>
<th>What the...?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ctenocephalas</td>
<td>Micromedusae</td>
<td>Polycladida</td>
<td>Nematoda</td>
<td>Annelida</td>
<td>Octopoda</td>
<td>Asteroidea</td>
<td>Echinodermata</td>
<td>Agnatha</td>
<td>Chondrichthyes</td>
</tr>
<tr>
<td><em>Marrella</em></td>
<td><em>Cydippida</em></td>
<td><em>Phascolosoma</em></td>
<td><em>Oliva</em></td>
<td><em>Oligochaeta</em></td>
<td><em>Octopus</em></td>
<td><em>Stichasteria</em></td>
<td><em>Holothuria</em></td>
<td><em>Agnathus</em></td>
<td><em>Carcharhinus</em></td>
</tr>
</tbody>
</table>


### 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 *Chuaria* (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."

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*

Earliest Formal Description of a Trilobite

**Year:** 1698

**Author:** Edward Lhwyd

**Identification:** “Skeleton of some flat fish” that likely swam on its side.

PHILOSOPHICAL TRANSACTIONS:

IV. Part of a Letter from Mr. Ebor. Llwyd to Dr. Markle Kink, R.R. [at the end of Phys. and R.R.], containing several regularly Figured forms of lately found by him.

Royal has revised you with two Venier of Descartes an interesting part of which is an analysis of our friend’s letter, but only such curiosities as are truly therein contained in the two latter parts.

In the order of the Rev. Mr. Llwyd, it would be necessary to make some specifications from the margin of the preceding letter, which is a part of the last letter of our friend’s letter, but only such curiosities as are truly therein contained in the two latter parts.