

WHITHER ANOMALOCARIS? THE SEARCH IN THE BURGESS SHALE CONTINUES

COLLINS, Desmond, Dept. of Invertebrate Palaeontology, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6, Canada.

A hundred years ago, Anomalocaris canadensis Whiteaves, 1892, was described as the body of a Phyllopod Crustacean. At NAPC III in Montreal in 1982, Whittington and Briggs showed that Anomalocaris canadensis was a claw, one of a pair at the front of an extraordinary predatory animal, whose jaws had previously been described as a jellyfish (Peytoia). The search to understand Anomalocaris and its relatives continues. So does the mistaken allocation of separated parts.

In 1991, the first complete Anomalocaris canadensis was collected. It has a fan tail, much like the tail of another Burgess Shale conundrum, Opabinia. Another new specimen shows that its head and claws were more flexible than previously realized, and its eyes were on stalks.

The large feeding claw, Appendage F, was allocated first to the arthropod, Sidneyia, by Walcott, then to the other Anomalocaris species, A. nathorsti, by Whittington and Briggs. The small size and lack of strong cross spines on the claws of A. nathorsti suggest that Appendage F probably came from another anomalocarid. Another puzzling feature on A. nathorsti is the thin, segmented structure running across the abdomen, one per body segment, ending in a club-shaped extremity on each side.

A third anomalocarid is now recognized in the Burgess Shale. Its front half is composed of 3 or 4 carapacelike parts previously named Hurdia and Proboscicaris. Two small sheathed claws on stalks are attached at the rear of the "carapaces". Hanging below the rear of the "carapaces" is a grasping, feeding organ composed of a pair of claws and Peytoia jaws with an inner set of teeth. It is connected to the body which has 11 segments and a tail. The two "oblique compressions" and the Peytoia jaws with the extra group of "spines" within the mouth allocated by Whittington and Briggs (1985) to Anomalocaris nathorsti almost certainly belong to the Hurdia anomalocarid.

It is evident that attempting to allocate anomalocarid parts to a particular anomalocarid is much like a Pin-the-Tail-on-the-Donkey game. In both cases the players are operating in the dark. The differences are that there is an unknown number of anomalocarids in the Burgess Shale and not only do they disarticulate easily, but they often have similar parts. As a consequence, our understanding of the anomalocarids is almost completely dependent on finding articulated specimens with the parts in place. This in turn depends on the success of field excavation. It took 100 years and 12 seasons of excavation to get the first complete Anomalocaris canadensis.