

ECOLOGY AND EVOLUTIONARY SIGNIFICANCE OF THE SIRIUS PASSET
FAUNA ARTHROPODS (LOWER CAMBRIAN OF NORTH GREENLAND)

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The Sirius Passet fauna is an exceptionally well-preserved biota from the Lower Cambrian of North Greenland. Although not as well-known as either the Burgess Shale or Chengjiang faunas, it is probably the oldest of all the major Cambrian lagerstätten. The arthropods from the fauna have a distinctly simple look to them ecologically, and phylogenetically many are likely to fall into the stem-groups of the extant groups. In addition, there are a number of taxa, with affinities to the anomalocaridids and lobopods, that can be considered to lie within the stem-group of the euarthropods. However, the extant myriapods cannot easily be accommodated into present schemes of arthropod phylogeny, nor do the Cambrian faunas shed much light on their ancestry; the possibility of them being independently derived from a lobopodous ancestor cannot be discounted.

The debate about exceptional faunas in the Cambrian continues to coalesce about the following problem: do the unusual taxa known tell us anything about the origins of modern phyla (and thus about the origins of the major features of invertebrate body plans), or do they represent effectively independent lines of evolution? Using the arthropods as an example, I shall argue that the former of these scenarios is correct, and that the Cambrian fossil record can provide documentation of how the modern phyla came to be assembled.