ARTHROPODS FROM NORTH GREENLAND: EXCEPTIONAL DATA IN THE 'CAMBRIAN EXPLOSION' DEBATE.

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'Sirius Passet' fauna arthropods from the Lower Cambrian Buen Formation of North Greenland form the major component of this exceptionally preserved biota. Early mineralisation of body cavities led to internal anatomy being preserved more readily than external structures such as limbs. Musculature and gut are known in three dimensional form. Many of the taxa present are more easily compared to extant arthropods than to flattened fossil material such as from the Burgess Shale.

The most common arthropod is represented by some 1600 specimens. Although widely differing in preservational style, these specimens may be reconciled to provide a coherent model of the three-dimensional anatomy of the arthropod. The affinities of this arthropod lie with the 'Cheliceromorph' rather than the Crustacean biramous-limbed arthropods, and may represent a fairly advanced lineage within the clade.

Recent discussions of the patterns produced by the early metazoan radiations have concentrated on data available from the Burgess Shale. The continuing discovery and description of other Cambrian lagerstätten such as from North Greenland and Chengjiang has highlighted the degree to which the Burgess Shale fauna should be considered to be an aliquot taken from the foment of the 'Cambrian Explosion'. The discovery of more taxa is tending to flesh out the bare bones of the Burgess fauna. Conclusions about phylogentic patterns drawn from the Burgess Shale alone may thus be premature.

Body patterning in the arthropods, and the validity of the '*Bauplan*' concept may be investigated by consideration of the actual mechanisms available for profound morphological change. One promising route is provided by the 'homeotic' and other hierarchically arranged developmental genes. When the mode of action of these genes is considered in conjunction with phylogenetic methods, it may prove possible to assess evolutionary pathways in terms of the feasibility of the morphological changes required by them rather than relying on what seems inherently reasonable or on marginal advantages in parsimony. Exceptionally preserved biotas also contain the evidence for the evolution of the developmental mechanisms themselves.

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