

Trilobite-based recognition of the Early–Middle Cambrian (Dyeran–Delamaran) boundary in the Labrador Group, western Newfoundland, Canada

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Paleontological and lithological studies of mixed siliciclastic—carbonate, predominantly shallow-water successions of the Forteau and Hawke Bay formations (Labrador Group), which have been ongoing since 1976 (34 measured sections; 434 fossil collections), have recently been reassessed. Until now, the succession has been broadly known to include late Early Cambrian to Middle Cambrian strata, but identification of the late Early Cambrian Dyeran Stage—early Middle Cambrian Delamaran Stage boundary has been elusive. Data collected from measured sections exposed in Chimney Arm, Canada Bay, have highlighted previously unidentified trilobite faunas, and indicate that the boundary is present in a thinly bedded, deeper water, fossiliferous succession of shale, siltstone, sandstone, and lime mudstone to packstone. The condensed succession lies close to the base of a unit of thinly bedded quartzose sandstone and shale previously placed in the lower half of the Hawke Bay Formation.

In ascending order, the taxa include: *Austinvillia virginica* Resser, olenellid gen. et sp. undet., *Olenellus howelli* Meek in White?, *Bonnia columbensis* Resser, *Bristolia mohavensis* (Hazzard and Crickmay), *Periomma* sp. undet., *Alokistocare* sp. undet., and *Syspacephalus* cf. *unca* (Walcott). Most of these are of known late Dyeran age. However, the genus *Alokistocare* is characteristic of the Middle Cambrian, which in Laurentia post-dates the last occurrence of olenellid trilobites. *Alokistocare* sp. undet. appears 2 m above the last occurrence of *O. howelli*. A correlation with the early Delamaran *Amecephalus arjoensis* Zone is suggested; the underlying, earliest Delamaran *Eokochaspis nodosa* Zone appears to be absent in Chimney Arm.