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To: Christophe 1-403-232-~~7009~~<sup>7009</sup>

From: Rolf (604) ~~814~~ 814-0151

Pages faxed including fax sheet = (5)

Christophe:

1-403-232-7009

## **Cambrian trilobite biostratigraphy of the lower Mackenzie River area based on collections submitted by Leanne Pyle**

**Rolf Ludvigsen**

The ten trilobite collections submitted number from C-518649 to C-518658. Collection C-518653 contains no identifiable trilobites. The remaining nine fossiliferous collections range in age from Early Cambrian (*Olenellus* Zone, Dyeran Stage) to Middle Cambrian (*Glossopleura* Zone, Delamarian Stage).

These trilobites are preserved in two strikingly different lithologies. One. Medium grey, silty limestone in collections C-518649, C-518654 and C-518655. This lithology tends to preserve large trilobites with the shell in three-dimensions. Two. Black, pyrite-rich paper shales in collections C-518650 to C-518652, and C-518656 to C-518658. This lithology tends to preserve small flattened fossils without the shell material.

Two sets of trilobite zones are present in both lithologies. See Figure 1:

*Olenellus* Zone Grey Ls (C-518649, C-518658) Black Sh (C-518658)

*Glossopleura* Zone Grey Ls (C-518654, C-518655) Black Sh (C-518650, C-519651)

The *Olenellus* Zone of the Grey Ls in all likelihood correlates to the same zone in the Black Sh. And the *Glossopleura* Zone of the Grey Ls correlates to the same zone in the Black Sh.

There is no independent stratigraphic evidence that positions C-518652 and C-518656 beneath the *Glossopleura* Zone, but the presence of species of *Stephenaspis* and *Poliella* in these collections seems to suggest that the *Albertella* Zone occurs in the Black Sh. If *Eoptychoparia piochensis* is correctly identified, then the basal Delamarian occurs in the Black Sh. at Mirror Lake.

**A cautionary note:** A comprehensive biostratigraphic analysis of these trilobites and strata in this area would require knowledge on the stratigraphic order of these collections. This is not available. As it stands now, there are just about as many stratigraphic sections (Mt. Clark, Carcajou Canyon, Dodo Creek, Graffe River, Little Bear River, Mirror Lake, Inlin Brook) as there are trilobite collections (C-518649 to C-518658). The order of the collections shown in Figure 1 is based on Cambrian trilobite biostratigraphy of others regions in North America.

### Trilobite identifications

C-518649

*Olenellus fremonti* Walcott

*Olenellus* Zone,

Dycran Stage

C-518650

*Glossopleura* sp., *Eoptychoparia* sp.

*Glossopleura* Zone

Late Delamaran Stage

C-518651

*Glossopleura* sp.

*Glossopleura* Zone

Late Delamaran Stage

C-518652

*Poliella germana* (Resser)

*Albertella* Zone

Early Delamaran Stage

C-518653

No identifiable trilobites

C-518654

*Glossopleura boccar* (Walcott), *Polyleuraspis* sp., *Bathyriscus* cf. *terranovensis* Young & Ludvigsen

*Glossopleura* Zone

Late Delamaran Stage

C-518655

*Glossopleura boccar* (Walcott), *Bathyriscus petalus* Fritz, *Poliella* sp.

*Glossopleura* Zone

Late Delamaran Stage

C-518656

*Stephenaspis* cf. *bispinata* Rasetti, *Poliella germana* (Resser)

*Albertella* Zone

Early Delamaran Stage

C-518657

*Eoptychoparia* cf. *piochensis* Palmer

*E. piochensis* Subzone

Basal Delamaran Stage

C-518658

*Olenellus gilberti* Meek, *Syspacephalus* sp., *Zacanthoides* sp.

*Olenellus* Zone

Dyeran Stage

references to North American Cambrian stages:

Ludvigsen and Westrop. 1985. Three new Upper Cambrian stages for North America. *Geology*, 13:139-143.

Palmer. 1998. A proposed nomenclature for stages and series for the Cambrian of Laurentia. *Canadian Journal of Earth Sciences*, 34:323-328.

Sundberg. 2005. The Topazan Stage, a new Laurentian stage (Lincolnian Series – "Middle" Cambrian). *Journal of Paleontology*, 79:63-71.

# STAGES

GREY, SILTY  
LIMESTONE  
FACIES

BLACK, PYRITE-RICH  
LAMINATED SHALE  
FACIES

TOPAZAN

CARCAJOU  
CANYON

C-518654

C-518655

C-518650

DOOD CREEK

C-518651

DOOD CREEK

DELA-

MARAN

C-518652

GRAPPE R.

C-518656

LITTLE BEAR R.

C-518657

MIRROR LAKE

MT. CLARK

C-518649

DYERAN

C-518658

INLIN BROOK

MONTEZUMAN

FIG 1

NORTH  
AMERICAN  
CAMBRIAN  
STAGES

SUNWARTAN  
STEPTOEAN  
MARJUMAN  
TOPAZAN  
DELAMARAN  
DYERAN  
MONTEZUMAN  
UNNAMED

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