

## NEW FOSSIL LOCALITIES IN THE MIDDLE ORDOVICIAN TABLE POINT FORMATION, BONNE BAY LITTLE POND AREA, WESTERN NEWFOUNDLAND

W.D. Boyce, P.Geo. and I. Knight  
Regional Geology Section

---

### ABSTRACT

*The trilobites Pseudomera barrandei (Billings, 1865) and Nileus scrutator Billings, 1865 are newly recorded from loose blocks and outcrop of rubbly, massive and platy, lime mudstone and wackestone of the Middle Ordovician (Whiterockian) Table Point Formation; they were found along an access road to the Aliant tower, Bonne Bay Little Pond area. Associated fossils include articulate brachiopods, gastropods and ostracodes. The faunas correlate with those of the Pseudomera barrandei and Cybelurus mirus trilobite zones of the Table Point and Table Cove formations at Table Point, and indicate a southward-younging direction for the formation, along the road, at the localities studied.*

---

### INTRODUCTION

Incomplete, 1:50 000-scale geological mapping is ongoing in the vicinity of Bonne Bay Little Pond, Lomond (NTS 12H/5) map area. A number of new fossil localities were discovered in rocks of the Middle Ordovician, Table Point Formation, Table Head Group along an access road to the Aliant tower, just west of Lomond River (Figure 1).

The Table Point Formation (Figure 2) is a thick sequence (100 m +) of minor peritidal to dominantly subtidal carbonates, of Middle Ordovician (Whiterockian) age, that is widely exposed in western Newfoundland. The type section is exposed just north of Bellburns, at Table Point, within the Table Point Ecological Reserve (Figure 1). The formation has attracted a lot of scientific attention as a result of the pioneering work of Billings (1865), and because of the richness of the contained faunas. Most recently, numerous species of gastropods were described by Rohr and Measures (2001) and Rohr *et al.* (2004) from the Table Point Ecological Reserve as well as the mollusc *Archinacella instabilis* (Billings, 1865) (Rohr *et al.*, 2008).

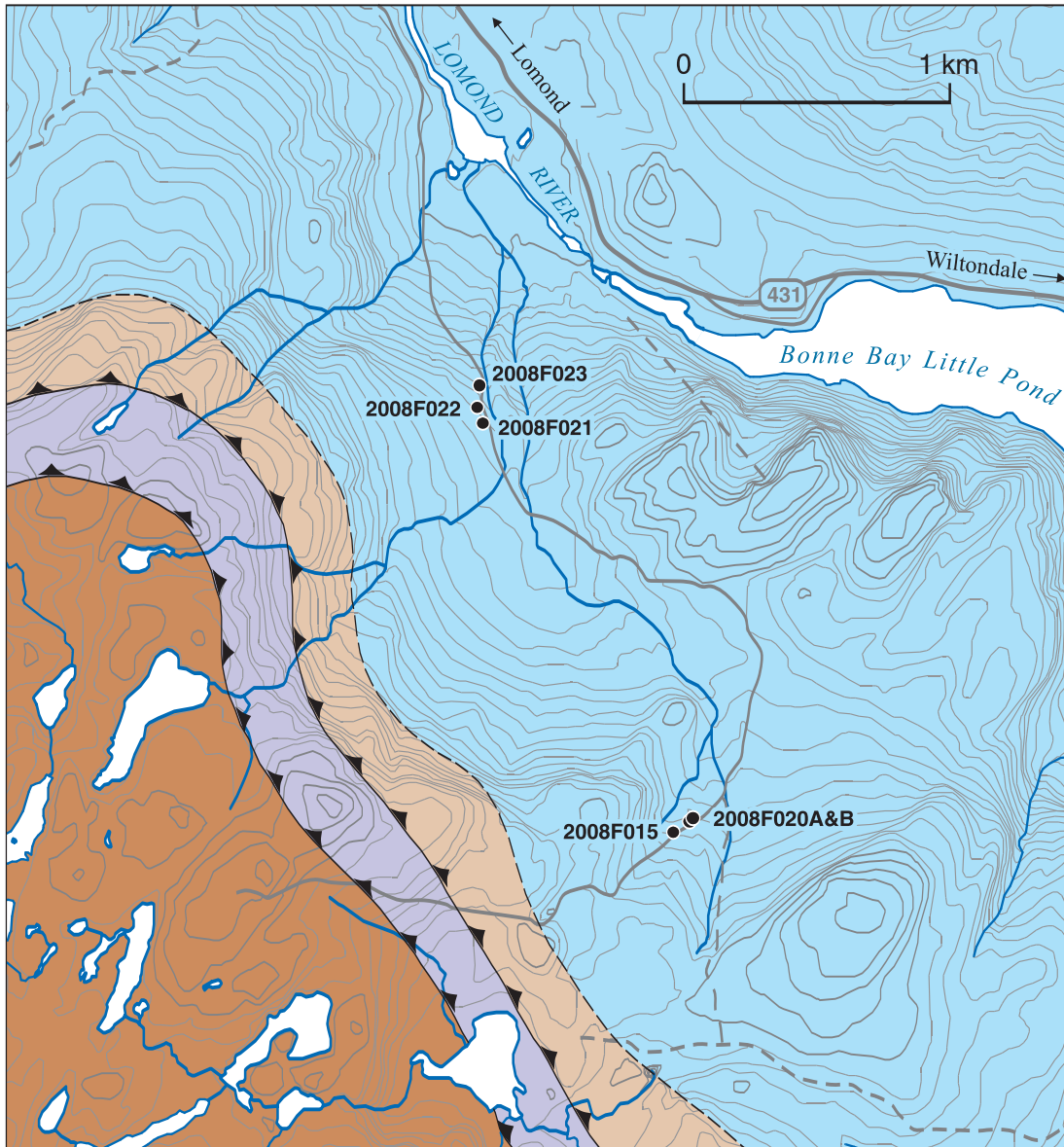
Richardson (*in Logan et al.*, 1863, pages 287-292 and 865-871) provided the first stratigraphic division of the succession at Pointe Riche and Table Point, based on his 1861 and 1862 reconnaissance mapping of western Newfoundland. Divisions K to N (Richardson, *in Logan et al.*, 1863, page 865) were first referred to as the Table Head Series by Schuchert and Dunbar (1934, pages 16 and 38), who divided it into three parts. Subsequently, the Table Head Series was renamed the Table Head Formation by Whittington and

Kindle (1963), who identified Schuchert and Dunbar's three parts as the lower, middle and upper Table Head Formation. These later became the Table Point, Table Cove and Black Cove formations, respectively, when Klappa *et al.* (1980) elevated the Table Head Formation to group status. Ross and James (1987) established the Spring Inlet Member for the lower 10 to 40 m of the Table Point Formation. Finally, Stenzel *et al.* (1990) removed the Black Cove Formation from the Table Head Group and assigned it to the overlying Goose Tickle Group.

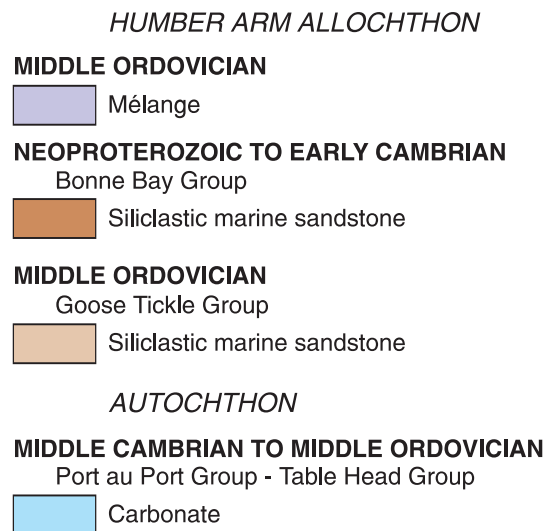
The Table Point Formation consists of thick to massive, fine-grained to bioclastic limestone, algal sponge wackestone to packstone, and algal oncolitic wackestone and is succeeded by shaly nodular to ribbon limestone and shale of the Table Cove Formation (Stenzel *et al.*, 1990). The upward-deepening environments of deposition include tidal flat, lagoon, shoal, open range shelf and sponge bioherms (Klappa *et al.*, 1980). Ross and James (1987) correlated the brachiopod fauna with that of the *Anomalorthis* zone of the Great Basin.

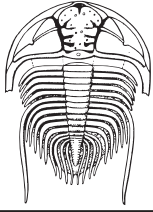


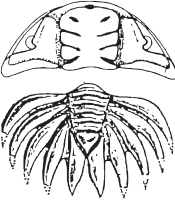



### PREVIOUS WORK

Boyce (1981) conducted reconnaissance hydrocarbon exploration in the Bonne Bay Little Pond area. This resulted in the discovery there of fossils in the Table Point Formation. Boyce (1980) identified the trilobite *Illaeus fraternus* Billings, 1865, from an exposure along the power line, west of the Aliant tower road, which then served as the southern boundary of Gros Morne National Park.



**Figure 1.** *Geology of Bonne Bay Little Pond area, showing the locations of the fossil sites along the the Aliant tower access road.*



LITHOSTRATIGRAPHY		TRILOBITE ZONES	CONODONT ZONES
TABLE HEAD GROUP	Table Cove Formation	 <i>Cybelurus mirus</i>	 <i>Histiodella bellburnensis</i>
			 <i>Histiodella kristinae</i>
	Table Point Formation	▲  <i>Pseudomera barrandei</i>	 <i>Histiodella tableheadensis</i>
		▲  <i>Uromystrum validum</i>	
ST. GEORGE GROUP	Aguathuna Formation	 <i>Bathyrus perplexus</i>	

**Figure 2.** Lithostratigraphy and trilobite and conodont biostratigraphy of the uppermost St. George Group and the Table Head Group within the Table Point Ecological Reserve (from Rohr et al., 2004). The trilobite and conodont zonations follow Boyce (1997) and Stouge (1984), respectively. The base of each zone is the FAD (First Appearance Datum) of the nominate species. The black triangles indicate the chert horizons.

## PRESENT STUDY

During the 2008 geological mapping survey, a number of new fossil-bearing limestone localities were discovered along an access road to the Aliant tower, southwest of Bonne Bay Little Pond; these new fossil-bearing limestone beds are the basis of this paleontological report.

Fossils correlative with the *Pseudomera barrandei* Trilobite Zone were identified from the more northerly localities 2008F021 to 2008F023 (Figure 1; Plates 1 to 3). The following taxa were recorded:

### Arthropoda–Trilobita

- ?*Nileus* sp. undet. – cranium, thorax
- Pseudomera barrandei* (Billings, 1865)

### Brachiopoda–Articulata

Gen. et sp. undet.

The more southerly locality 2008F020A and 2008F020B (Figure 1) yielded fossils indicative of the younger *Cybelurus mirus* Trilobite Zone, including:

### Arthropoda–Ostracoda

- Bivia bivia* (White, 1877)?

### Arthropoda–Trilobita

- Nileus scrutator* Billings, 1865
- ?*Illiaenus* sp. undet.

### Brachiopoda–Articulata

- Gen. et sp. undet.

### Mollusca–Gastropoda

- Maclurites?* *acuminatus* (Billings, 1865)





**Plate 1.** A) Fossiliferous blocks from the Table Point Formation, Aliant tower access road, Bonne Bay Little Pond area, western Newfoundland. B) Gastropod *Maclurites emmonsi* (Billings, 1865) from 2008F015 (NFM F-759). Lens cap for scale.

The above faunal distribution demonstrates a southward-younging direction for the Table Point Formation along the access road to the Aliant tower in the area of the outcrops.

## CONCLUSIONS

Fossils collected from the Table Point Formation along the access road to the Aliant tower indicate the presence of the *Pseudomera barrandei* and *Cybelurus mirus* zones. These faunas indicate that the Table Point Formation youngs southward along the road in the area of the outcrops.

## ACKNOWLEDGMENTS

The authors thank Devon Seymour and Josh Manning, respectively, for capable, enthusiastic and good-natured field assistance during the summer of 2008. The specimens illustrated in this report are housed in the Natural History Annex of The Rooms Provincial Museum (NFM), St. John's; Mr. Randy Batten (Natural History Collections Manager) provided specimen numbers. Dr. W. Lawson Dickson critically reviewed the first draft of the manuscript.

## REFERENCES

- Billings, E.  
1865: Palaeozoic Fossils. Volume I. Containing descriptions and figures of new or little known species of organic remains from the Silurian rocks. 1861-1865. Dawson Brothers, Montreal. Geological Survey of Canada, Separate Report, 426 pages.
- Boyce, W.D.  
1980: Important new fossil horizons, western Newfoundland. Unpublished abstract of talk presented October 18, 1980 at the Annual Fall Meeting, Geological Association of Canada, Newfoundland Section.
- 1981: The geology, potential of Reid Lot 207. Unpublished report, A. and V. Harris Exploration Services Ltd., 10 pages. [O12H/05/0710]
- 1997: Early to Middle Ordovician trilobite-based biostratigraphic zonation of the Autochthon and Parautochthon, western Newfoundland, Canada. Second International Trilobite Conference, Brock University, St. Catharines, Ontario, August 22-25, 1997, Abstracts with Program, page 10.
- Klappa, C.F., Opalinski, P.R. and James, N.P.  
1980: Middle Ordovician Table Head Group of western Newfoundland: a revised stratigraphy. Canadian Journal of Earth Sciences, Volume 17, pages 1007-1019.
- Logan, W.E., Murray, A., Hunt, T.S. and Billings, E.  
1863: Geology of Canada. Geological Survey of Canada. Report of Progress from its Commencement to 1863; illustrated by 498 wood cuts in the text, and accompanied by an atlas of maps and sections. Dawson Brothers, Montreal, 983 pages.
- Rohr, D.M., Boyce, W.D. and Measures, E.A.  
2008: The Middle Ordovician mollusc *Archinacella* from the Table Point Formation (Table Head Group), western Newfoundland. In Current Research. Government of Newfoundland and Labrador, Department of Natural Resources, Report 08-1, pages 93-99.
- Rohr, D.M. and Measures, E.A.  
2001: Middle Ordovician (Whiterockian) gastropods of western Newfoundland: Macluritoidea and Euomphaloidea. Journal of Paleontology, Volume 75, pages 284-294.





**Plate 2.** Fossils from the Table Point Formation, Aliant tower access road, Bonne Bay–Little Pond area, western Newfoundland. A) Overview of locality 2008F020A. B to D) Trilobite *Nileus scrutator* Billings, 1865 from 2008F020A. Dorsal, close-up and oblique posterior views of cephalon (NFM F-760). One-cent coin (18 mm in diameter) for scale. E) Articulate brachiopod from 2008F020A (NFM F-761). One-cent coin (18 mm in diameter) for scale. F and G) Gastropod *Maclurites?* *acuminatus* (Billings, 1865) from 2008F020B (NFM F-762). One-cent coin (18 mm in diameter) for scale.





**Plate 3.** *Trilobite* *Pseudomera barrandei* (Billings, 1865) from 2008F023. Dorsal and close-up view of pygidium (NFM F-763). A photographic illusion makes it appear as a cast instead of a mold. One-cent coin (18 mm in diameter) for scale. Table Point Formation, Aliant tower access road, Bonne Bay Little Pond area, western Newfoundland.

Rohr, D.M., Measures, E.A. and Boyce, W.D.  
2004: Middle Ordovician (Whiterockian) gastropods from the Table Point Formation, western Newfoundland. Newfoundland Department of Mines and Energy, Report 04-1, pages 225-234.

Ross, R.J. Jr. and James, N.P.  
1987: Brachiopod biostratigraphy of the Middle Ordovician Cow Head and Table Head groups, western Newfoundland. *Canadian Journal of Earth Sciences*, Volume 24, pages 70-95.

Schuchert, C. and Dunbar, C.O.  
1934: Stratigraphy of western Newfoundland. *Geological Society of America, Memoir 1*, 123 pages.

Stouge, S.  
1984: Conodonts of the Middle Ordovician Table Head Formation, western Newfoundland. *Fossils and Strata*, Number 16, 145 pages.

Stenzel, S.R., Knight, I. and James, N.P.  
1990: Carbonate platform to foreland basin: revised stratigraphy of the Table Head Group (Middle Ordovician), western Newfoundland. *Canadian Journal of Earth Sciences*, Volume 27, pages 14-26.

## APPENDIX

Fossil localities in the Table Point Formation (Table Head Group), along the Aliant tower access road, Bonne Bay Little Pond area, NTS 12H/05 (Lomond), UTM Zone 21

The datum for the fossil sites is NAD27. "2008F" = W.D. Boyce's samples; "K-2008-" = I. Knight's samples. The UTM coordinates and the altitude are shown in metres as indicated by GPS. + = case - = mold

### 2008F015 = GAST01

Loose blocks of massive lime mudstone/wackestone. 448011E, 5468862N, 302 m.

Brachiopoda–Articulata

Gen. et sp. undet.

Mollusca–Gastropoda

*Maclurites emmonsii* (Billings, 1865) – see Plate 1

### 2008F020A = SHELL01

Loose blocks of massive lime mudstone/wackestone and thinner, more planar-bedded lime mudstone. 448069E, 5468904N, 295 m. Cybelurus mirus Zone.

Arthropoda–Ostracoda

*Bivia bivia* (White, 1877)?

Arthropoda–Trilobita

*Nileus scrutator* Billings, 1865 – cephalon (+) – see Plate 2B – 2D

?*Illaeus* sp. undet. – pygidium (+)

Brachiopoda–Articulata

Gen. et sp. undet. see Plate 2E

### 2008F020B

Loose blocks of massive lime mudstone/wackestone. 448082E, 5468914N, 302 m.

Mollusca–Gastropoda

*Maclurites? acuminatus* (Billings, 1865) – see Plate 2F, 2G

### 2008F021

Loose block of massive lime mudstone/wackestone. 447295E, 5470396N, 191 m. *Pseudomera barrandei* Zone.

Arthropoda–Trilobita

*Pseudomera barrandei* (Billings, 1865)

### 2008F022

K-2008-049B. Lime mudstone/wackestone. 447274E, 5470459N, 195 m. *Pseudomera barrandei* Zone.

Arthropoda–Trilobita

?*Nileus* sp. undet. - cranidium, thorax

Brachiopoda–Articulata

Gen. et sp. undet.

### 2008F023

Float and outcrop of rubbly weathering lime mudstone/wackestone. 447281E, 5470542N, 184 m. *Pseudomera barrandei* Zone.

Arthropoda–Trilobita

*Pseudomera barrandei* (Billings, 1865) – 2 pygidia (-) – see Plate 3

Brachiopoda–Articulata

Gen. et sp. undet. (+) – from loose material

