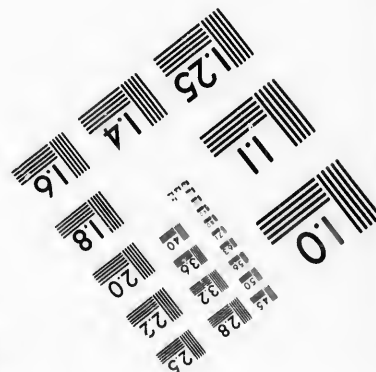
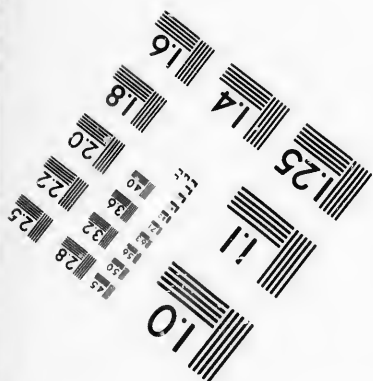
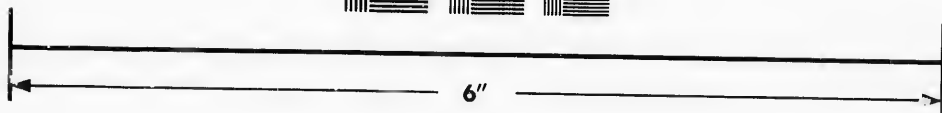
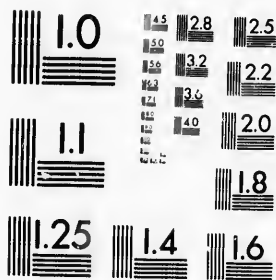
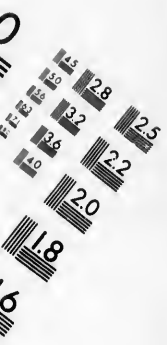


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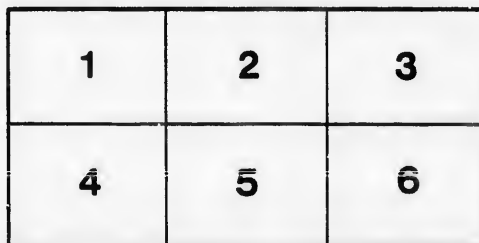
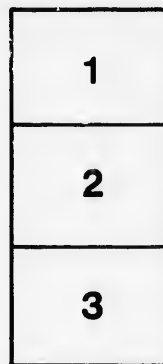
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# LIST OF FOSSILS

Found in the Cambrian Rocks,  
in or near Saint John, N. B.

1892

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By

G. F. MATTHEW~~s~~, M.A., F.R.S.C.

(Reprinted from Natural History Society Bulletin No. X.)

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SAINT JOHN, N. B.  
Barnes & Co., Prince Wm. Street.  
1892.

#### ERRATA.

The following errors occur in the columns of this catalogue:

- No. 27. The mark (asterisk) is opposite No. 28.
- No. 28. The mark is opposite *Loganograptus*.
- No. 66. The mark is opposite No. 67.
- No. 106. Does not occur in Division *1d*.
- No. 124. The mark is opposite No. 125.
- Nos. 140, 141 and 142. The marks for these are respectively one line too low in the page.
- No. 143. The mark is omitted, but should be in Division *3b*.

Also:

At page xii., line 8 of the text, for *Lingnella* read *Lingulella*.

# List of Fossils found in the Cambrian Rocks in and near St. John.

BY G. F. MATTHEW, M. A., F. R. S. C.

As the study of the organic remains found by the author and others in the Cambrian rocks around St. John is now nearly finished, it is possible to give a list of these remains, showing the zoological standing of the species and the various horizons at which they have been found.

In order to make the catalogue more useful for reference, a brief description is given of the rocks of the several levels at which the fossils were found.

These rocks are divisible into two series, there being a break in the succession of the beds at the top of the Basal Series, where its upper beds have been considerably worn to furnish material for the lowest beds of the next series, the St. John Group.

Although we make two divisions in the lower series, we have not ventured to call them stages, as the faunas, so far as known, are not sufficiently distinct to make it advisable. We therefore regard this as one stage.

## BASAL SERIES OF ROCKS OR ETCHEMINIAN STAGE.

The section at Hanford Brook is one of the clearest known for this series, and from the base upward is as follows (all the following sections are ascending):

|                  |  | Thickness in feet. |
|------------------|--|--------------------|
| Div. 1. <i>a</i> | Coarse purplish red conglomerate, . . . . .  | 60                 |
| <i>b</i>         | Grey and purplish flags, shales and sandstones, . . . . .  | 70                 |
| <i>c</i>         | Purplish red sandstones with greenish layers, . . . . .  | 240                |
| Div. 2. <i>a</i> | Purplish red conglomerate, more friable than 1 <i>a</i> , . . . . .  | 35                 |
| <i>b</i>         | Soft purplish red slates with greenish glauconite grains,<br>the upper part firmer and more sandy; greenish grey<br>layers interspersed, especially toward the base, . . . . . | 175                |
| <i>c</i>         | Purplish sandy shales, with a few bands of greenish<br>shale, . . . . .  | 300                |
|                  | Space without exposures, . . . . .   | 320                |
|                  |  | 1,200              |



Other good exposures of this series are found at Ratcliff's, Millstream, Simonds, and at Caton's Island on the Long Reach of the St. John River.

ST. JOHN GROUP (ACADIAN GROUP, Dawson.)

This series is much more important for its faunas than the preceding, and for this reason is divided into three stages.

*Division 1, or Acadian Stage.*—A section at the north end of St. John (at Seely street) gives the following succession :

|  | Thickness in feet.                                    |
|--|---|
| a Coarse grey sandstone, or quartzite,.....  | 50  |
| b Coarse grey sandy shale. (Zone of <i>Agraulos articephalus</i> ),....                                      | 50  |
| c Fine grey and dark grey shales, with calcareous nodules.<br>(Zone of <i>Paradoxules Eteninicus</i> ),..... | 25  |
| d Fine dark grey carbonaceous shales. (Zone of <i>Paradoxides Abenacus</i> ),.....                           | 75  |
|  | <hr style="width: 100%; border: 0.5px solid black;"/> |
|  | 200   |
|  | <hr style="width: 100%; border: 0.5px solid black;"/> |

This division is also visible on the south side of the St. John Basin, at the shore of Courtney Bay, near the Alms House, where its thickness is three times as great as at Seely Street; the increase is mostly in Section *d*. It also crosses the city from Duke street and Mecklenburg street on the east, to Lower Cove slip on the west; here it is no longer visible, partly because it has been eroded and partly because of the filling in of streets. On the western side of the harbour it occupies part of the Mill Pond in Carleton, and extends up the valley south of King's Square, to the west of the Mill Pond.

*Division 2, or Johannian Stage.*—This is a very prominent member of the St. John Group in the Old City and in Carleton, or West End. Also in Portland, or North End, there is a good exposure at Wright Street, where the following measured section was made :

|  | Thickness in feet.                                    |
|--|---|
| a Dark grey slates with thin seams of grey sandstone,.....   | 220   |
| b Coarse grey slate and grey flagstone, the flags predominating. (Zone of <i>Lingulella Starri</i> ),..... | 300   |
| c Grey flagstone and grey slate in frequent alternations. (Zone of <i>Lingulella radula</i> ),.....        | 230   |
|  | <hr style="width: 100%; border: 0.5px solid black;"/> |
|  | 750   |
|  | <hr style="width: 100%; border: 0.5px solid black;"/> |

In the centre of the St. John Basin the thickness of this division, especially of its upper part (Section *c*), is greatly increased. The whole division there counts about 1,000 feet of measures. It is visible on the east side of Courtenay Bay, from its head to the Alms House brook. In the Old City it forms a broad belt across the centre, bounded on the north by a line from Union street east, to the Carleton Ferry, and on the south by one from Orange street east, to Reed's Point. On the west side of the harbour it rises prominently into a ridge at King's Square, south of which its width extends for the space of one block (or square).

*Division 3, or Bretonian Stage.*—This division includes at the summit a small thickness of beds, which belong to the Ordovician system; but although not Cambrian, they form a part of the St. John Group, and are therefore included in this statement.

The Bretonian consists entirely of fine shales of dark color, much of it being intensely black and carbonaceous. It contains three faunas and so marks the passage of a long interval of time.

|  | Thickness in feet. |
|--|--------------------|
| <i>a</i> Black shales alternating with dark grey shales, and having calcareous nodules. (Zone of <i>Parabolina spinulosa</i> ),... | 100 ?              |
| <i>b</i> The same as the last, but finer. (Zone of <i>Peltura scarabeoides</i> ),  | 100 ?              |
| <i>c</i> Black carbonaceous shales. (Zone of <i>Dictyonema flabelliforme</i> ),  | 300                |
| ? Same as the last, fauna unknown,.....  | 175 ?              |
| <i>d</i> Similar shales with a few sandy seams. (Zone with <i>Tetragraptus quadribanchiatus</i> ),.....                            | 25 ?               |
|  | 700                |

These soft rocks lie in the valley along the boundary line between the Old City and Portland ("South End and North End,") and extend thence through the harbour to the "Falls" of the St. John River where their thickness is seven hundred feet. Another belt of the rocks of this division extend across the city from Market Square and Water street north, to St. David's street on Courtenay Bay. The rocks of this division always occupy low land, except on the south side of "the valley," where they rise on its southern flank, crossing Jeffrey's Hill, and extending to the City Hospital, etc.

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|--------------------|-----|
| Thickness in feet. |     |
| .....              | 50  |
| .....              | 50  |
| .....              | 25  |
| oxides             |     |
| .....              | 75  |
|                    | 200 |

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| Thickness in feet. |     |
| .....              | 220 |
| nina-              |     |
| .....              | 300 |
| Zone               |     |
| .....              | 230 |
|                    | 750 |

iv. LIST OF FOSSILS FOUND IN CAMBRIAN ROCKS.

Thus, of Cambrian rocks in the St. John Basin, taking the measurements where the structure is not too much complicated by faults and folds, and where the several members attains their greatest thickness, we have the following :

|   | Thickness in feet. |
|---|--------------------|
| Basal Series (Etcheminian) at Hanford Brook, St. Martins, ..... | 1,200              |
| Division 1 (Acadian) at the Alms House, Simonds, .....          | 650                |
| Division 2 (Johannian) at King's Square, Carleton, .....        | 1,000              |
| Division 3 (Bretonian) at Straight Shore, Portland, .....       | 700                |
|   | 3,550              |

The thickness of Division 2 is probably greater in the city than in Carleton; it appears to be 2,000 feet, but there are no doubt folds in the beds, not easily detected, that produce this great apparent thickness.

Probably the whole thickness measured, where the several divisions show the greatest bulk, and including the Basal Series, would not fall far short of 4,000 feet.

This is not equal to the thickness of the Welsh Cambrian rocks which is greatly increased by intercalated beds of volcanic ashes, etc.

The faunas, or assemblages of animals in the St. John rocks, as shown by their remains, exhibit a remarkably close resemblance to those of Cambrian rocks around the Baltic Sea, though separated from them by the wide Atlantic. On the other hand they have very little resemblance to the Cambrian faunas of the interior of America, though only a few hundred miles lie between.

In the following table the species in each genus are arranged generally in the order of their antiquity, and the following abbreviations are used:—v=variety; sp.=species; r=rare; cf=compare with; nar=narrow. Also for authors:

|                         |                        |
|-------------------------|------------------------|
| Htt. = C. F. Hartt.     | L. = Linnaeus.         |
| Dn. = Sir J. W. Dawson. | Ang. = Angelin.        |
| Dav = T. Davidson.      | Brög. = Brögger.       |
| Salt. = J. W. Salter.   | Eich. = Eichwald.      |
| Hick. = Hy Hicks.       | Pand. = Pander.        |
| Walc. = C. D. Walcott.  | Wahl. = Wahlenberg.    |
|                         | Lins. = J. Linnarsson. |

Where no reference is given the species have been described by the author in the volumes of the transactions of the Royal Society of Canada, or are unpublished. To the latter category belong Nos. 22, 27, 35, 36, 64a and b, 67, 77, 78, 79, 137, 140, 146.





ON 3.

c<sup>2</sup> ? d

# CAMBRIAN FOSSILS

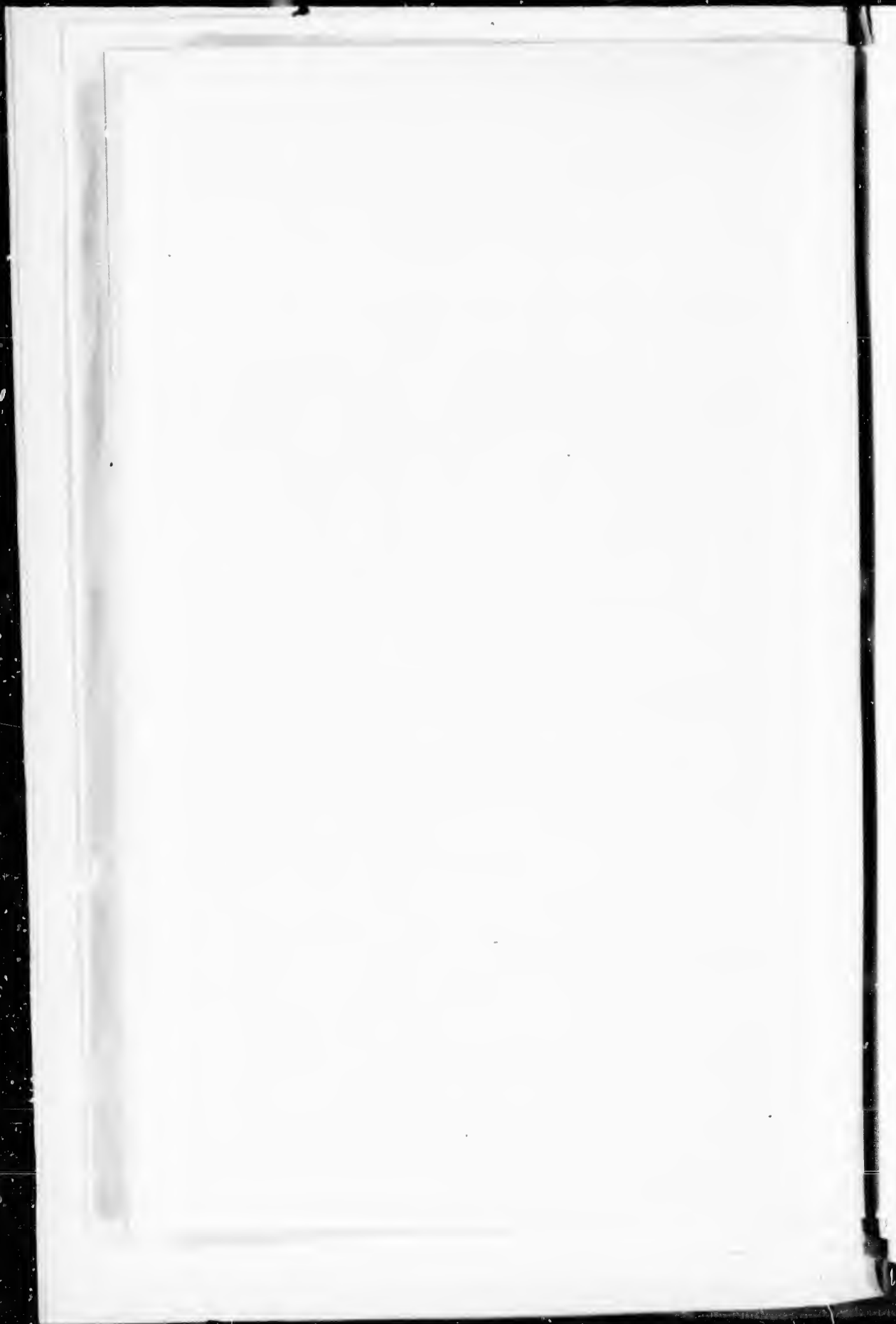
FOR SALE.

The subscriber is having a few sets, of about fifty species, of the Cambrian Fossils of the St. John Group prepared for sale. They will be ready for distribution in September. Most of the species are different from those found elsewhere in America, and more nearly resemble European species.

G. F. MATTHEW.

St. John, N. B., Canada.  
May, 1892.

*Can you find sale for a set?*











LIST OF FOSSILS FOUND IN CAMBRIAN ROCKS.

FOSSILIFEROUS HORIZONS, ETC.—(Continued.)

|                               | SAINT JOHN GROUP. |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
|-------------------------------|-------------------|-------------|-------------|---|----------------|----------------|---------|---|---|-------------|---|---|----------------|----------------|---|---|
|                               | Basal Series      |             | DIVISION 1. |   |                |                | Div. 2. |   |   | DIVISION 3. |   |   |                |                |   |   |
|                               | Division 1.       | Division 2. | a           | b | c <sup>1</sup> | c <sup>2</sup> | d       | a | b | c           | a | b | c <sup>1</sup> | c <sup>2</sup> | ? | d |
| <b>Trilobita—(Continued.)</b> |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| 116 A.—(Strenuella)           |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| Halliana                      |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| 117 Liostracus tener,         |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| Hartt, sp.                    |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| 117a acuminate var.           |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| 117b smooth variety           |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| 118 L.—ouangondianus          |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| Hartt, sp.                    |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| 118a v. immarginata           |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| 118b v. aurora,               |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| Hartt, sp.                    |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| 118c v. gibba                 |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| 118d v. plana                 |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| 119 Ptychoparia               |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| Linnarssoni, Brög. sp.        |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 120 P.—alata                  |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 121 Solenopleura              |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| Robbii, Hartt, sp.            |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 122 S.—Acadica                |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| Whiteaves                     |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 122a v. elongata              |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 123 Anomocare                 |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| stenotoides                   |                   |             |             |   |                |                |         |   |   |             |   |   |                |                | * | ? |
| 124 A.—spiniger               |                   |             |             |   |                |                |         |   |   |             |   |   |                |                | * | ? |
| 125 Conocoryphe               |                   |             |             |   |                |                |         |   |   |             |   |   |                |                |   |   |
| Walcotti                      |                   |             |             |   |                | *              |         |   |   |             |   |   |                |                |   |   |
| 126 C.—Baileyi,               |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| Hartt, sp.                    |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 127 C.—elegans,               |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| Hartt, sp.                    |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 127a v. granulatus            |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 128 Ctenocephalus             |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| Matthewi                      |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 128a v. geminispinosus        |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| Hartt, sp.                    |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 128b v. hispidus              |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 128c v. perhispidus           |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 129 Paradoxides               |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| lamellatus, Htt.              |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 129a v. loricatus             |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 130 P.—Acadicus               |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 130a v. suricus,              |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |
| 131 P.—Etemincus              |                   |             |             |   |                |                |         |   |   | *           |   |   |                |                |   |   |



## FOSSILIFEROUS HORIZONS, ETC.—(Continued.)

|  | SAINT JOHN GROUP.          |             |   |                |                |         |   |   |             |   |   |   |   |     |
|--|----------------------------|-------------|---|----------------|----------------|---------|---|---|-------------|---|---|---|---|-----|
|  | Basal Series               | DIVISION 1. |   |                |                | Div. 2. |   |   | DIVISION 3. |   |   |   |   |     |
|  | Division 1.<br>Division 2. | a           | b | c <sup>1</sup> | c <sup>2</sup> | d       | a | b | c           | a | b | c | c | ? d |
| <b>Tracks, Burrows &amp; Trails—(Continued.)</b> |                            |             |   |                |                |         |   |   |             |   |   |   |   |     |
| 151 <i>Monoeraterion</i>                         |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| <i>magnificum</i>                                |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| 152 <i>Arenicolites</i> Lyelli.                  |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| Torr, v. minor *                                 |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| 153 A.—brevis                                    |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| 154 <i>Frena</i> ramosa                          |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| 155 <i>Goniadichnites</i>                        |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| <i>trichiformis</i>                              |                            |             |   |                |                |         |   | * |             |   |   |   |   |     |
| <b>Incerti sedis—</b>                            |                            |             |   |                |                |         |   |   |             |   |   |   |   |     |
| 156 <i>Eocoryne</i> geminum                      |                            |             |   |                |                |         |   |   |             |   |   |   |   |     |
| 157 <i>Lepidilla</i> anomala                     |                            |             |   |                |                |         |   |   |             |   |   |   |   |     |

From this catalogue it will be seen that the middle and upper part of Division 1 in which the Cambrian fossils were first found, continues to be the richest collecting ground. Division 2, as a comparatively barren ground, divides the lower from the upper faunas. Fossils of the lower orders prevail in the Basal Series; but the Hydrozoa, with a few exceptions, show themselves abundantly only in the Upper division (St. John Group). The Linguellæ show their control of the Cambrian rocks by their uniform distribution; but the Trilobites, though abounding in the Upper and Lower divisions of the St. John Group, have left scarcely any remains in the intermediate strata.

The Agnosti in this list are arranged in three groups or sections; Nos. 97-100 are *Limbati*; 101-106 are *Longifrontes*; 107-108 are *Brevifrontes*; the fourth section of this genus, *Lavigati*, is unknown in the St. John Group. Of the three groups present it will be observed that the *Limbati* have the widest range, and that the *Brevifrontes* are confined to the horizon 1d.

DIVISION 3.

|          |          |   |          |
|----------|----------|---|----------|
| <i>c</i> | <i>c</i> | ? | <i>d</i> |
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