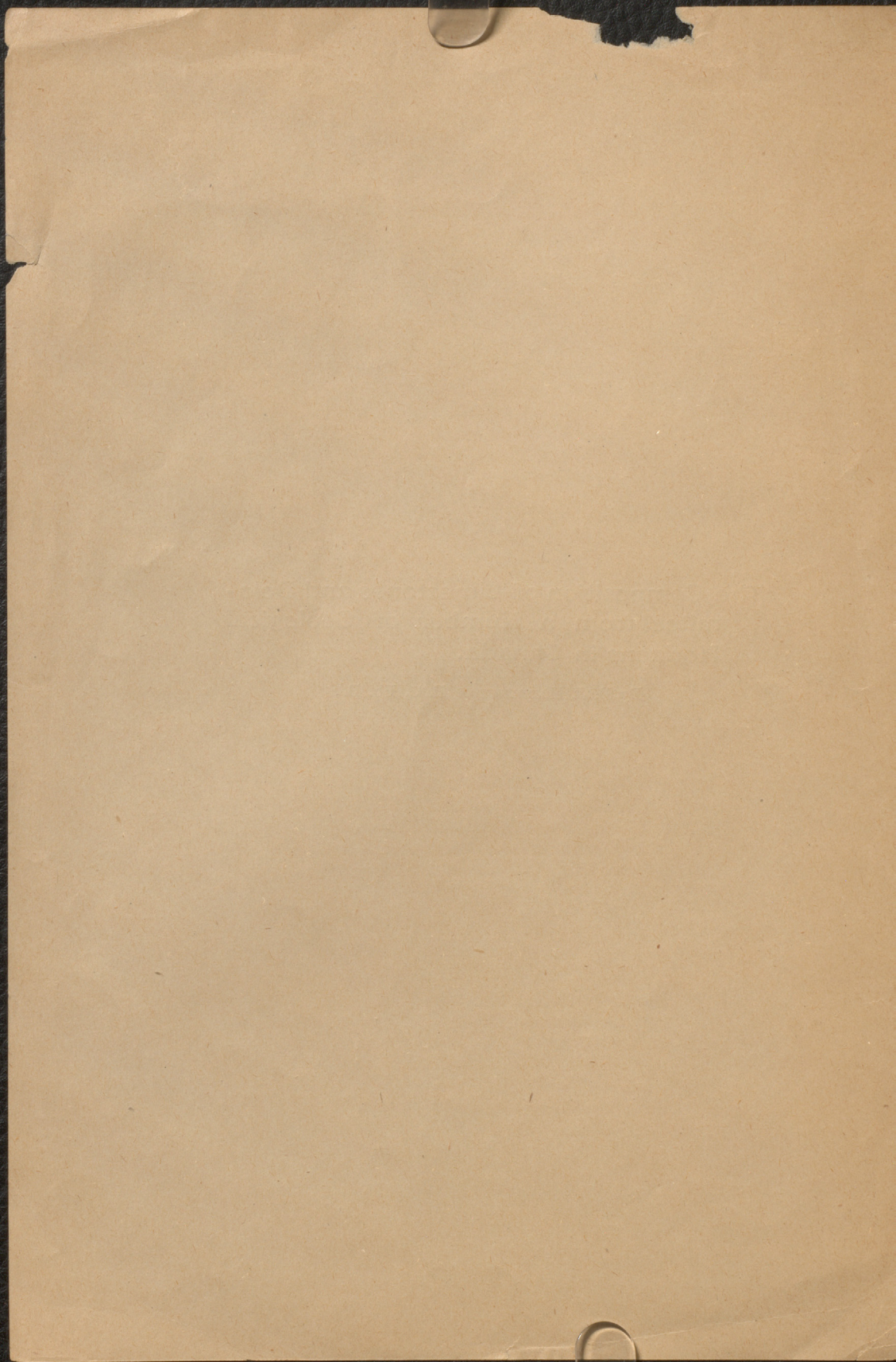


The Composition of Limestones and Dolomites from a Number of Geological Horizons in Canada.

By B. J. HARRINGTON, B.A., Ph. D.



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The following analyses of limestones and dolomites from various localities in Canada have been brought together in the hope that they may be of interest to students of geology or of value for technical purposes. Some of them have appeared in previous papers or reports by the writer, but others are now published for the first time. In some cases they are incomplete, the main object as a rule having been to ascertain the proportions of calcium and magnesium carbonates. They are arranged in the order of the geological formations from which they are supposed to have been derived.

CAMBRIAN ?

1. From about six miles above Yale on the Fraser River, British Columbia. The limestone at this locality is white and crystalline, and occurs interstratified with grey gneiss. A specimen collected by the writer was found to contain :

Calcium carbonate.....	91.55
Magnesium "	1.43
Ferrous "	0.16
Alumina.....	0.27
Insoluble matter.....	5.62
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	99.03

A small quantity of the stone has been used for making lime.

LEVIS FORMATION. (*Siluro-Cambrian.*)

2. From Little Metis Bay on the Lower St. Lawrence, where thin bands of impure rusty-weathering dolomite are interstratified with black shales. A specimen from one of these bands gave on analysis:

Calcium carbonate	35.46
Magnesium "	26.40
Ferrous "	4.67
Insoluble matter.....	32.19
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	98.72

It was in the black shales of this locality that the fossil sponges described by Sir William Dawson and Dr. Hinde were discovered.

3. From the third range of Wickham, in the Eastern Townships. A blackish-grey limestone with somewhat conchoidal fracture. The dark colour is due to the presence of a little carbonaceous matter, which, however, burns away during calcination, leaving a buff-coloured lime from which gelatinous silica separates on treatment with hydrochloric acid. Analysis gave:

Calcium carbonate.....	70.53
Magnesium "	6.77
Ferrous "	3.02
Alumina.....	3.85
Silica	15.95
Carbonaceous matter.....	undt.
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	100.12

4 The limestone used in the blast-furnace at Drummondville, P. Q., and probably from the Levis formation of that region. Analysis gave:

Calcium carbonate.....	52.12
Magnesium "	3.86
Ferrous "	4.82
Alumina.....	2.93
Insoluble matter.....	33.50
Copper.....	traces.
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	99.23

CALCIFEROUS FORMATION.

5. From the township of Rigaud, near to the Rivière à la Graisse and also to the boundary line between Quebec and Ontario. A hard rusty-weathering dolomite supposed to be from the Calciferous formation. Its analysis gave :

Calcium carbonate.....	39.91
Magnesium "	32.85
Alumina and ferric oxide.....	3.56
Insoluble matter.....	23.54
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	99.86

The insoluble portion contained,

Silica.....	76.34
Alumina and ferric oxide.....	14.74
Lime.....	1.02
Magnesia.....	7.99
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	100.09

6. McNab, Ontario, Range III, lot II. A compact, dark brownish-grey limestone with conchoidal fracture. It was found to contain :

Calcium carbonate.....	81.78
Magnesium "	13.68

The stone is somewhat fossiliferous and probably less magnesian than the average material from the Calciferous. It has been used for building purposes at Arnprior.

7. McNab, Ontario, Range XIV, lot IX. From close to the shore of Lac des Chats on the Ottawa, and about two miles above the mouth of the Madawaska. A compact brownish-grey dolomite dotted with occasional crystals of white calcite. A partial analysis gave :

Calcium carbonate.....	53.00
Magnesium "	43.88

From the same set of beds as No. 6, but considerably lower in the formation.

CHAZY FORMATION.

8. Pembroke, Ontario, Range I, lot XII. Compact, light

brownish-grey limestone, with conchoidal fracture. Analysis gave:

Calcium carbonate.....	83.96
Magnesium "	9.29
Ferrous "	0.69
Insoluble matter	6.06
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	100.00

The stone occurs in beds from six to eighteen inches thick and has been used for building purposes.

BLACK RIVER FORMATION.

9. From the "Rockland Quarry," on the bank of the Ottawa River, two miles south-east of Rockland Village, Clarence County, Ontario. A very compact grey limestone containing a little carbonaceous matter. A specimen with specific gravity 2.704 was found to contain:

Calcium carbonate.....	94.70
Magnesium "	2.37
Ferrous "	0.18
Insoluble (including carbonaceous matter).....	2.75
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	100.00

This is an excellent stone both for structural purposes and for making lime. It is classed here as from the Black River formation, but according to Dr. Ami the beds at the quarry belong in part to the Trenton, and a sharp line cannot be drawn between the two formations.

TRENTON FORMATION?

10. From Mount Royal Park, Montreal, a short distance north-east of the Park-keeper's house. A white to grey limestone whose crystalline texture has no doubt been induced by thermal action in connection with the eruptive mass of Mount Royal. A specimen of this limestone was found to have a specific gravity of 2.768 and gave on analysis:

Lime	42.07
Magnesia	1.85
Ferrous oxide.....	1.13
Alumina.....	2.96
Carbon dioxide	29.83
Silica	22.19
Moisture.....	0.06
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	100.09

This analysis was made by Mr. Herbert Molson, student in Applied Science.

NIAGARA FORMATION.

11. Grimsby, Ontario. Brownish-grey dolomitic lime stone, holding a few fossils. Analysis gave:

Calcium carbonate.....	68.92
Magnesium "	29.48
Ferrous "	1.10
Insoluble matter.....	0.50
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	100.00

12. Dundas, Ontario. Brownish-grey compact dolomite. A specimen was found to contain:

Calcium carbonate.....	51.85
Magnesium "	41.65
Ferrous "	0.62
Insoluble matter.....	5.88
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	100.00

CARBONIFEROUS ?

13. From the Thompson River, British Columbia, 185 miles above Vancouver and about seven miles above Spence's Bridge. A thick bed of grey limestone, well suited for making lime, exposed in a cutting on the line of the Canada Pacific Railway. Analysis of a specimen collected by the writer gave:

Calcium carbonate.....	97.81
Magnesium "	1.08
Ferrous "	0.72
Alumina.....	0.14
Insoluble matter....	0.90
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	100.65

PERMO-CARBONIFEROUS.

14. From Miminigash on the west coast of Prince Edward Island. A reddish-grey limestone containing less insoluble matter than most of the limestones found on the Island. Analysis of a specimen gave:

Calcium carbonate.....	78.07
Magnesium "	3.51
Alumina and ferric oxide.....	2.69
Insoluble matter.....	15.49
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	99.76

15. From New London, Prince Edward Island. One of the reddish "conglomerate limestones," occurring in many localities on the Island. Composition:

Calcium carbonate.....	59.52
Magnesium "	1.04
Alumina and ferric oxide.....	2.47
Insoluble matter.....	35.52
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	98.55

16. From Kildare, Prince Edward Island. A red conglomerate magnesian limestone, occurring in association with the red sandstones and shales of Kildare. Analysis gave:

Calcium carbonate.....	44.00
Magnesium "	22.93
Alumina and ferric oxide.....	3.73
Insoluble matter.....	26.59
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	97.25

TRIASSIC.

17. Peace River, British Columbia. *Blackish-grey carbonaceous limestone, containing fragments of *Monotis sub-circularis*. A specimen collected by Dr. Selwyn was found to have a specific gravity of 2.67, and gave on analysis:

Calcium carbonate.....	48.47
Magnesium "	5.85
Ferrous "	0.85
Insoluble matter	42.26
Carbonaceous matter, water and loss.....	2.57
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	100.00

18. Peace River. Another specimen from the same region as the last was lighter in colour, being less carbonaceous, but also very impure. It was collected by Dr. Selwyn and its analysis gave:

Calcium carbonate.....	38.98
Magnesium "	7.59
Ferrous "	1.14
Insoluble matter.....	51.13
Carbonaceous matter, water and loss.....	1.16
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	100.00

* See Rept. Geol. Survey of Canada 1875-76 p. 75, and 1876-77 p. 485.

NOTE.—In numbers 5, 14, 15, 16, the iron in the soluble portion of the rock may have been present partly or entirely as carbonate. The "insoluble matter" of the analysis is the portion that did not dissolve in boiling for about half an hour in hydrochloric acid.