



GEOLOGICAL  
SURVEY  
OF  
CANADA

DEPARTMENT OF MINES  
AND TECHNICAL SURVEYS

This document was produced  
by scanning the original publication.

Ce document est le produit d'une  
numérisation par balayage  
de la publication originale.

PAPER 65-34

SUCCESSION OF ORDOVICIAN ROCKS  
AT LAKE TIMISKAMING

G. Winston Sinclair



**GEOLOGICAL SURVEY  
OF CANADA**

**PAPER 65-34**

**SUCCESSION OF ORDOVICIAN ROCKS  
AT LAKE TIMISKAMING**

**G. Winston Sinclair**

**DEPARTMENT OF MINES AND TECHNICAL SURVEYS**

© Crown Copyrights reserved

Available by mail from the Queen's Printer, Ottawa,  
from Geological Survey of Canada,  
601 Booth St., Ottawa,  
and at the following Canadian Government bookshops:

OTTAWA

*Daly Building, corner Mackenzie and Rideau*

TORONTO

*Mackenzie Building, 36 Adelaide St. East*

MONTREAL

*Æterna-Vie Building, 1182 St. Catherine St. West*

or through your bookseller

A deposit copy of this publication is also available  
for reference in public libraries across Canada

Price 35 cents Cat. No. M44-65/34

*Price subject to change without notice*

ROGER DUHAMEL, F.R.S.C.  
Queen's Printer and Controller of Stationery  
Ottawa, Canada

1965

CONTENTS

	Page
Abstract .....	v
Introduction .....	1
The Ordovician Section .....	1
Description of formations .....	2
Dawson Point Formation .....	2
Farr Formation .....	2
Bucke Formation .....	3
Guigues Formation .....	4
General Relations .....	4
Note of the Barneveld Stage .....	4
References .....	5



ABSTRACT

Ordovician outliers on the Canadian Shield near Lake Timiskaming comprise four major lithic units; these units in ascending order are sandstone, shales, limestone and shales. Formation names are proposed for the four units which are all assigned to the Liskeard Group. The youngest formation is of Edenian age, the oldest is of Wilderness age.



## SUCCESSION OF ORDOVICIAN ROCKS AT LAKE TIMISKAMING

---

---

### Introduction

Ordovician rocks occur as small outliers near the northern end of Lake Timiskaming. The nature of the beds as seen in outcrop, the geological setting, and the history of early studies has been described by Hume (1925) and by Henderson (1936). Recently more detailed reports by Thomson (1964, 1965) describe most of the areas within which Ordovician rocks are found, and include excellent maps.

The writer first visited the area in 1957 and fossils were collected which confirmed Hume's conclusion that most of the exposed limestones were equivalents of the Trenton; a large microfauna unknown to Hume was found in beds below the limestones. Since 1957 several brief visits have been made, some in company with M.J. Copeland of the Geological Survey, who has undertaken the study of the ostracods. The report on this ostracod fauna is now in press as GSC Bulletin 127, titled "Ordovician Ostracods from Lake Timiskaming, Ontario". When this Bulletin was being prepared we were aware that Dr. Robert Thomson had a report in press dealing with part of this region, and it was not known which paper would appear first. The stratigraphic introduction to Copeland's Bulletin avoided introduction of new terms, lest they conflict with Thomson's work. This report has been published (Thomson, 1965) and there is now no reason for leaving the stratigraphy indefinite. This description of the section is being published in Paper form so that it may be available to workers using the Bulletin on the ostracods.

Dr. Copeland and I wish to express our appreciation of the assistance and hospitality of Mr. D.W. Atchison of the Provincial Institute of Mining, Haileybury, Ontario. The important core LT-1, from which much of the information below is derived, has been deposited with the Geological Survey through the kindness and generosity of Dr. Robert Thomson of the Ontario Department of Mines.

### The Ordovician Section

Until 1965 a clear understanding of the Ordovician of the region was hampered by lack of knowledge of the upper limit of the beds. It was apparent, on structural evidence, that some beds should exist between the highest exposed Ordovician and lowest exposed Silurian, but their nature was wholly unknown. Hume suggested that they might be Richmond, but only because Richmond beds are widespread and might be expected here.



This uncertainty has now been removed by the ore from Drillhole LT-1, which provides a complete section from the Silurian through the Ordovician into the Precambrian. This core has been carefully described by Thomson (1965, pp. 27-30) and readers are referred to his log for details. Examining this log, it will be seen that the Ordovician beds fall into four broad lithic units, which are here described as formations:

Footage	375.7 - 473.7	Soft shales (Dawson Point Formation).
	473.7 - 664	Mainly limestones (Farr Formation).
	664 - 743	Mainly shales, with thin limy and sandy layers (Bucke Formation).
	743 - 840.7	Mainly sands, sandstone, conglomerates (Guigues Formation).

The term Liskeard may be considered as applying to a Group, if reference is made to the Ordovician rocks of the region as a whole.

#### Description of Formations

Dawson Point Formation. Named for the land closest to the Drillhole LT-1, which was put down 4,420 feet south and 1,700 feet east of the northeast corner of Lot 2, Concession A, Harris township (see Thomson 1965, p. 59). This formation is not known to outcrop, and at present all information about it is derived from this core. It is a soft green or grey shale, 98 feet thick, from 375.7 to 473.7 feet. The contact with the overlying Silurian Wabi Formation is sharp. The contact with the underlying Farr Formation is also sharp, with the suggestion of a corrosion surface. Fossils are common. Most are fragments of graptolites, of generalized climacograptid or diplograptid type; several Lingula were also noted. The most significant fossils are Triarthrus cf. rougensis Parks and Leptobolus insignis Hall. These species are not known to occur above the Gloucester in the Ottawa Valley, the Blue Mountain on Georgian Bay and the Sheguiandah on Manitoulin Island. The age of the Dawson Point can therefore be given with certainty as Edenian.

Farr Formation. Named for the typical exposures in and near the Farr quarry on Lot 10, Concession III, Bucke township, 1/2 mile west of Haileybury, Ontario. In this quarry, and along adjacent roads, are exposed mottled limestones in very heavy beds, with a thickness of about 35 feet (see Goudge 1938, pl. XLVA for a photograph of these beds). Similar beds are seen in several fields and road-cuts where the new Cobalt-New Liskeard highway by-pass crosses the Bucke-Dymond township line. Mottled limestones also occur a little farther north, in the second concession of Dymond township at Lots 4 and 5. These had been thought to be the same beds as those seen in the Farr quarry, but the LT-1 core shows that there are about 130 feet of limestone above the Farr exposure, of similar lithology, so that

exact equivalence cannot be assumed. Similar mottled beds with the same fossils are seen in a small outcrop 2 miles north of St. Bruno de Guigues, Quebec.

The Farr Formation is considered to include limestones both above and below those seen at the type locality, and to have a total thickness of 190 feet.

The lower part of the formation is exposed in the old quarry on Lot 10, Concession V, Bucke township. It has been described by Copeland under the heading "upper unit". The contact with the underlying Bucke Formation is very sharp and suggests a disconformable relationship.

It should be noted that Hume's "Streptelasma corniculum beds" are here included in the Farr Formation, although Hume described them as shales. It is clear that Hume was using the term to include shaly limestones which weather readily to a rubble. It seems more expedient to group these beds with the overlying purer limestones, especially since their faunas seem to be very similar.

As the resistant mottled limestones of the Farr are the only Ordovician beds which outcrop naturally, the published fauna (Hume, 1925) is almost entirely the fauna of these beds. Part of this fauna is unique, or is only found in beds of disputed age, but many species, e.g. Pleurocystites squamosus Billings, Hormotoma trentonensis Ulrich & Scofield (not of Wilson), Rhynchotrema intermedia Wilson, Strophomena extensa Wilson and others suggest a correlation with the Cobourg limestone as identified at Ottawa. This correlation agrees with that originally made by Hume. The evidence from Drillhole LT-1 that these beds are overlain by shales of Edenian age confirms the dating based on fossils. The Farr Formation is then, in current terms, considered to be of late Barneveld age. (This term is comparatively new, and is discussed in an appended note.)

Bucke Formation. Named for Bucke township, where these beds are exposed in an old quarry on Lot 10, Concession V. This quarry was operated to obtain high calcium limestone from the lower part of the Farr Formation, but a trench was made in shales below to allow a spur for the adjacent railway to enter the quarry. The upper beds of the Bucke Formation are exposed in this trench. This section shows about 8 feet of dark soft fissile shales with thin limy and sandy interbeds, which have been described by Copeland. Similar beds, predominately shale, are found in the available cores, and suggest a total thickness for the unit of approximately 90 feet. In the core LT-1 the thickness assigned to the Bucke is 87 feet. The contact with the underlying Guigues Formation is not clearly seen. The fossils collected from the Bucke, especially the ostracods described by Copeland, indicate a late Wilderness age for the formation. The type section of the Bucke Formation is the lower unit of Copeland.

Guigues Formation. Named for Guigues township, Quebec, where these beds are seen in an old quarry on Lot 19, Range II. This locality has been described by Henderson (1936, p. 26). The exposure shows about 45 feet of clean sand, very poorly cemented in the lower part, but near the top of the quarry bound into a limy conglomerate. Thomson's log of Drillhole LT-1 shows a sandstone at 750-756 feet, underlain by 84 feet which did not core. The material from this footage has been preserved, and shows a clean unconsolidated sand throughout. The lower 90 feet of this section are therefore considered to be the Guigues. The few fossils which have been found in the Guigues are very poorly preserved, but they suggest a Wilderness age.

#### General Relations

Detailed discussion of the palaeogeographic and stratigraphic implications of this Lake Timiskaming section would be out of place here, but two points of general interest may be mentioned.

The geological history implicit in this section is strikingly similar to that seen in the outliers around Lake St. John, Quebec. In both regions shales of Eden age (Gloucester, Dawson Point) lie directly on late Barneveld limestones (Galets, Farr) with no beds which could be equivalent to the Collingwood. In both regions, too, beds of late Barneveld age (Shipshaw, Farr) rest directly on beds dated as late Wilderness (Simard, Bucke), with nothing corresponding to the early Barneveld Hull and Shoreham Formations. (See Sinclair 1953, p. 849, and Sinclair 1963, p. 18, for discussion of the Lake St. John outlier.)

As has been suggested above, the fauna of the Farr limestone is sufficiently similar to that of the Cobourg at Ottawa to support correlation with those beds. However, the strongest similarity is with the fauna of the beds at Silliman's Fossil Mount, at Frobisher Bay in Baffinland. Copeland reports that the ostracods of the Bucke also suggest relationship with those reported from Frobisher Bay. (See Miller et al. 1954 and Sinclair 1956, p. 126, for discussion of this outlier.)

#### Note of the Barneveld Stage

Discussion of Ordovician stratigraphy has been greatly facilitated by the erection of a number of Stages by Cooper and Cooper (in Cooper 1956, pp. 6-9). Two of these concern the present study. The Wilderness Stage has been generally accepted, and is gradually coming into use as a valuable term. Following the Wilderness, Cooper and Cooper recognized a "Trenton Stage". The reality and usefulness of this stage are apparent, but its name has been a source of confusion, since the rocks laid down during this stage do not correspond to the Trenton Group. This ambiguity has been removed

by the proposal by Fisher (1962) of the term Barneveld Stage, to replace the Trenton Stage of Cooper and Cooper. This new name is adopted here. In the Lake Timiskaming region the Farr Formation falls within the Barneveld Stage, and apparently rather late in it. In the Ottawa Valley the formations of Barneveld age are the Hull, and the Sherman Fall and Cobourg as those names are used at Ottawa. The Rockland Formation of the Ottawa Valley is the youngest of the Wilderness Formations. This does not change the stage limits as defined by Cooper and Cooper, since their work was done before revival of the term Kirkfield, and these Central Ontario beds were still being called Hull.

#### References

Cooper, G.A.

- 1956: Chazyan and related Brachiopods; Smithsonian Misc. Coll., vol. 127, pt. I.

Fisher, D.W.

- 1962: Correlation of the Ordovician rocks in New York State; N.Y. State Mus., Sci. Serv., Geol. Surv. Map, Chart Ser., No. 3.

Goudge, M.F.

- 1938: Limestones of Canada, part IV, Ontario; Canada Dept. Mines, Resources, Mines, Geol. Br.

Henderson, J.F.

- 1936: Geology and mineral resources of Ville-Marie and Guillet (Mud) Lake map-areas, Quebec; Geol. Surv. Can., Mem. 201.

Hume, G.S.

- 1925: The Palaeozoic outlier of Lake Timiskaming, Ontario and Quebec; Geol. Surv. Can., Mem. 145.

Miller, A.K., Youngquist, Walter, and Collinson, Charles

- 1954: Ordovician cephalopod fauna of Baffin Island; Geol. Soc. Am., Mem. 62.

Sinclair, G.W.

- 1953: Middle Ordovician beds in the Saguenay Valley, Quebec; Am. J. Sci., vol. 251, p. 841.

- 1956: Review of Miller et al., 1954; Am. J. Sci., vol. 254, p. 126.

- 1963: Observations on the Ordovician limestone at Clearwater Lake, Quebec; Geol. Surv. Can., Bull. 100, p. 15.

**Thomson, Robert**

1964: Preliminary report on Bucke township, District of Timiskaming;  
Ont. Dept. Mines, PR 1960-2.

1965: Casey and Harris townships; Ont. Dept. Mines, Geol. Rept. 36.