

## NOTES

BY

ALFRED R. C. SELWYN,

OF A PRELIMINARY GEOLOGICAL RECONNAISSANCE FROM

LAKE SUPERIOR,

BY THE ENGLISH AND WINNIPEG RIVERS, TO

FORT GARRY.

On the above named exploration, to about midway between Lonely Lake and Lake Winnipeg, viz. to Separation Lake, I was accompanied by Mr. R. Bell and the members of his party, who during the earlier part of the season had been occupied in prosecuting and extending the explorations which were commenced in the Lake Superior region by Mr. Bell in 1861. Details respecting the constitution of the party and other matters and incidents connected with the journey from Thunder Bay to Separation Lake are given in Mr. Bell's report, which also embraces accounts of the earlier operations of the season. As stated in his report, Mr. Bell arrived at Thunder Bay with his party on the 17th of June. On my arrival there on the 5th of August, I learnt that Mr. Bell had started the same morning on a trip with Mr. McIntyre from Fort William, and that he expected to be absent about ten days. Subsequently it appeared that Mr. McIntyre having occasion to visit the Hudson Bay Co's post at Lac Bois Blanc, Whitewood or Basswood Lake, by all of which names this lake seems to be known, had kindly offered Mr. Bell a passage in his canoe, and as an excellent opportunity was thus afforded to gain some information relating to the geological features of the route to be traversed from the Kaministiquia River *via* Pigeon River to Whitewood Lake, and thence to Sturgeon Lake on the Dawson Red River route, by which Mr. McIntyre proposed to return to Fort William, Mr. Bell gladly availed himself of the offer. At the same time Mr. Bell's party had been sent to make some further explorations in the valley of the Black Sturgeon River at the head of Black Bay. The results of this journey and of the explorations above named are given in Mr. Bell's report.

Continuation by  
Mr. Bell of ex-  
plorations  
begun in 1861.

Trip to Bass-  
wood Lake.

Black Sturgeon  
River.

Silver-mining  
locations of  
Thunder Bay.

In the ten days interval between my arrival at Thunder Bay and the return there of Mr. Bell, and of his party, respectively on the 17th and on the 16th of August, I visited and examined a number of the principal silver-mining locations around the western shores of the bay, and extended my

exploration along the Red River road as far as the Mattawa bridge, twenty-three miles west from Prince Arthur's Landing. I was unable to visit the now celebrated Silver Islet Mine, and was also obliged to postpone to some future occasion an investigation which I hoped to make into the relations of the different members of the Upper Copper-bearing series, as exhibited in the country between Thunder Bay and the eastern shores of Nipigon Bay, and around Lake Nipigon.

To Mr. J. W. Dawson, C. E., Superintendent of the Red River road, and to Mr. E. Borron, Provincial Inspector of Mines, my best thanks are due, not only for much useful information, but also for their unremitting kindness and attention, and for their ready assistance in all matters in which the means at their disposal enabled them to facilitate our operations. Acknowledgment of assistance.

On the 19th of August our whole party left Prince Arthur's Landing, and proceeded, *via* the Red River route, to Lac des Mille Lacs, which is reached by the Height-of-Land Portage road, about one mile in length, between it and Lake Kashabowie. We arrived at Lac des Mille Lacs on the evening of the 21th of August, and were delayed there several days by the non-appearance of the Indians who had been engaged to accompany us as canoe-men and guides. On the 29th of August, Mr. Bell having succeeded in engaging other Indians, we were enabled to proceed on our journey, and left Lac des Mille Lacs by the Seine River. On the 10th of September we camped on the shore of Sturgeon Lake, and at mid-day on the 20th of the same month, we reached the Hudson Bay Company's Post on Lac Seul or Lonely Lake. Start from Prince Arthur's Landing.

On the 13th of September, on Sturgeon Lake River, about 14 miles west of Sturgeon Lake, we fell in with Mr. Jarvis, C. E., in charge of one of the Survey parties of the Canada Pacific Railroad, Division M. He was running the line eastward to Sturgeon Lake, and had come in from Fort Garry *via* the Lake of the Woods and Minnetaki Lake. From information which Mr. Jarvis gave us respecting this route, we decided to make our way out by the English and Winnipeg Rivers, as, though not the most direct, it seemed likely to prove the most expeditious route, and would not involve retracing our steps after reaching Lonely Lake. The Indians who accompanied us from Shebandowan had deserted us on the 5th of September, and the last of those who had accompanied us as guides from the Sturgeon Lake side left us at this camp, the state of our larder, I imagine, not being sufficiently attractive to induce them to favor us any longer with their company. Our party was, however, augmented here by the addition of six of Mr. Jarvis' men, whose services he no longer required, and who were anxious to return as quickly as possible to their homes on Red River. Starting on the 16th September from our camp at the crossing point of the railroad, we descended the Sturgeon Lake River, making Choice of route.

Portages on  
Sturgeon Lake  
River.

Canoe route  
from Minnetaki  
Lake to Lonely  
Lake.

Arrival at  
Hudson Bay  
Post.

Islands in  
Lonely Lake.

about ten miles to the head of the second rapids and portage, 210 yards in length. The following day, about four miles more brought us to the rapids and falls by which the Sturgeon Lake River discharges into Lake Minnetaki. Three portages were made in this distance, respectively 1,500 yards, 250 yards, and 1,280 yards in length. During the time of high water the greater part of these rapids could be descended in safety with loaded canoes. At the time we passed them the water was probably nearly at its lowest stage. The river is from thirty to fifty yards wide, and the length of the portages sufficiently attests its rough and turbulent character. The fall between Otter Lake and Minnetaki Lake is probably not less than one hundred and fifty feet. From Minnetaki Lake to Lonely Lake the canoe route is through such an intricate labyrinth of water that it is almost impossible for any one traversing it for the first time to do so without mistake; and the numerous bays, headlands and islands are so much alike, that it is equally difficult to be guided by instructions. None of our present party were acquainted with the route, and in consequence we several times took wrong turns, which led us into bays at the head of which neither portage-road nor outlet were to be found. Fortunately, when about one day's journey from Lonely Lake, and quite at a loss in which direction to seek for the portage, which we knew we must cross between the waters we were then on and those leading us to Lonely Lake, we encountered a roving Indian, who, in consideration of some small presents, put us on the right track, passing through a number of narrow swampy channels, where, without a guide, we should probably never have thought of seeking for the portage. Crossing this portage, 1,758 yards in length, we camped at the further end, on the banks of a small lake, the waters of which discharge by Canoe River direct into Lonely Lake, distant about seven miles in a straight line bearing N. 30° W Magnetic. The following day, the 20th of September, as already stated, we reached the Hudson Bay Post. Here we replenished our stock of provisions by the addition of a few pounds of pemmican, and in the afternoon, having been most hospitably entertained by Mr. McKenzie, whom we found in charge of the Post, we proceeded on our voyage down the lake, and camped on the west end of a large island, about two miles distant, and near the northern shore of the lake. From here to the outlet at the head of English River—except where we crossed several deep bays stretching to the north-eastward, generally beyond the limits of our vision, and from two to four miles wide—our course lay close to the north shore, and generally among islands of all dimensions, from a mere rock just showing above the water, to areas of several miles in extent. For twenty-five miles, or to near the first narrows, where the lake contracts to a width of less than a quarter of a mile, the direction we followed varied but little from west, magnetic. Thence, for about an equal distance to the outlet, our course was

W. 30° N. About a mile and a half below the outlet, we came to the first falls and rapids of the English River. These are passed by two portages, respectively of one hundred and one hundred and fifty yards in length, with a pool between the falls about 200 yards across. I estimated the height of the upper fall at about fourteen feet, and that of the lower one at thirty-five feet. On the 23rd of September, we camped at the foot of the lower fall. The following day about noon, we reached the junction of the Mattawa River, a considerable stream which joins the English River from the north-west, and drains a large section of country in that direction, including Red Lake or Trout Lake, and a number of other smaller lakes. Descending the English River you look directly up the course of the Mattawa, and you have here the somewhat singular phenomenon of two large streams meeting each other apparently from exactly opposite directions. The united waters turn south, at right angles to the course of both streams above their junction, and, after flowing about two miles, mostly bordered by swampy flats and lagoons swarming with water fowl, make a sharp turn to the east, and issue into a lake, which appeared to be about a mile and a half wide and two miles long. The course across this Lake, which we named Duck Lake, was about E. 20° S., and at the head of a small bay on the south-east side, we came to the third portage on the English River. The outlet from the lake is through a steep rocky gorge or canon, and between the former and the foot of the portage, which is 1,600 yards in length, the course of the river describes two-thirds of the circumference of a circle having a radius of about half a mile. This portage is about sixteen miles below the second. Just as we reached it, and before we could get our tents pitched, a storm set in which lasted almost without intermission for the two following days and nights, detaining us from the evening of Tuesday the 24th, to Friday morning the 27th. On the morning of the 26th, snow lay three to four inches thick on the ground. At 6 a.m. the thermometer registered 38°, at 3 p.m. 44° and at 9 p.m. 46°; the barometer at the same hours 28.48, 28.68 and 28.74. On the 23rd, at 9 a.m., the barometer had fallen to 28.02. This storm occasioned disastrous floods at the mouth of Red River, by which several lives were lost, and its ravages on the southern shores of Lake Winnipeg we subsequently witnessed.

Starting again on the 27th., we travelled about nineteen and a-half miles, and passed the fourth, fifth, sixth and seventh portages, respectively 60 yards, 75 yards, 50 yards and 66 yards in length. At each of these portages there are falls of from eight to twelve feet. The fifth, sixth and seventh are all within a length of one mile, and the last, at which we camped, and which we named Oak Point Fall, is remarkable for its wild and picturesque beauty, as well as for the first appearance of oak trees on the English River. Immediately below the fall is a lake about a mile wide,

stretching to the north-east and to the south-west across the course of the river. Our guide informed us that at the head of this lake, about twelve miles distant in the direction first named, a large river discharges. At about seven miles nearly south from Oak Point portage, we reached the next fall and rapid. These are passed by a portage 700 yards in length, across a ridge which divides a small lake above the rapids from another commencing immediately below them and extending for the next five miles. Both these lakes are studded with islands, and vary in width from one to two miles, with very irregular and indented shore lines. Flower Lake River, fifty miles up which to the southward is Eagle Lake, joins the English River here, and from this point to our camp on Separation Lake, where the canoe-route *via* Sandy Lake to Rat Portage branches off, there are about twenty-eight miles of good canoeing without portage, through small lakes or lake-like expansions of the river, all of which are studded with a multitude of rocky islets, and bounded by wonderfully indented and irregular shore-lines.

Portage of 700 yards.

Flower Lake River.

Twenty-eight miles of good canoeing.

Leaving Separation Lake, the river contracts considerably, and the current is very swift, with numerous eddies and whirlpools. In about six miles, we came to the ninth, tenth and eleventh falls and portages, all of which occur in a distance of about two miles. These portages are respectively 210 yards, 180 yards and 360 yards in length, and the falls about eight, twelve and eighteen feet in height. Twenty-six miles further, the twelfth and last fall and portage on the English River is reached at about nine miles above the confluence of the Winnipeg, one mile below

Portages.

Winnipeg River. which is Island Portage. The Winnipeg River with its numerous and picturesque falls and rapids has been so frequently travelled, and has been so graphically described, first by Keating in 1828, in his "Narrative of an Expedition to the Source of St. Peter's River," and subsequently by Professor Hind, in 1858, in his "Report on the Canadian Red River Exploring Expedition," that it would be impossible, by merely passing along it as we did, to add anything to the details already given of it by those authors. We reached Island Portage early on the 2nd of October, and at 6 p.m. on the 6th arrived at Fort Alexander. Our traverse of Lake Winnipeg from Fort Alexander to the mouth of Red River occupied from the afternoon of the 7th to the evening of the 11th, adverse winds having detained us for two days. On the 18th of October we reached Fort Garry, having completed a canoe journey of about 550 miles in forty-four days travel, and made seventy portages of a total length of 14.79 miles.

Arrival at Fort Garry.

Distances between Lac des Mille Lacs and Fort Alexander.

The distances as estimated and laid down on my sketch map of the route from the outlet of Lac des Mille Lacs to Fort Alexander are approximately as follows:—

From the outlet of Lac des Mille Lacs to Sturgeon Lake, including twenty-five portages, together 9,836 yards.....	Miles. 100
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	Miles
From our camp, south-east shore of Sturgeon Lake, to the Hudson Bay Post on Lonely Lake, with thirteen portages, together 7,848 yards.....	81
From Lonely Lake Post to the English River.....	52
From the outlet of Lonely Lake to Separation Lake, where the canoe route to Rat Portage leaves the English River, with eight portages, together 2,801 yards.....	82
Separation Lake to the confluence of Winnipeg and English Rivers above Island Portage, with four portages, together 940 yards.....	41
Thence to Fort Alexander by Lee River and Bonnet Lake, with twenty portages, length 4,595 yards.....	105
	461

Professor Hind gives the latter distance, *via* the main river and the Seven Portages, as one hundred and four miles; and the distance between Island Portage and Otter Fall he makes forty-nine miles, while my estimate is forty-seven.

From barometric observations on Lac Seul it would appear to be about 1,150 feet above the sea, giving a fall of 245.53 feet for the English River to Island Portage, and 276.47 thence to Lake Winnipeg, assuming the latter to be 620 feet above the sea, or the same elevation as Lake Superior.

#### GEOLOGICAL FEATURES.

In Mr. Bell's report a full description is given of the geological features which were observed between Lac des Mille Lacs and Separation Lake, and thence, *via* Sandy Lake, to the Lake of the Woods. The rapidity with which we were obliged to travel rendered it impossible to extend our observations beyond the immediate vicinity of the route followed, and even on it we were often for many miles together at such a distance from the land as to make it impossible to determine precisely what was the character of the rocks. Notwithstanding this, however, the main objects of this reconnaissance were fulfilled, in giving a general idea of the physical features of the country and of its geological structure. The most important and interesting point which has been ascertained in this connection is the occurrence of a series of great parallel bands of schistose and slaty strata traversing this region, which hitherto was supposed to be almost exclusively occupied by Laurentian gneiss. The aspect and lithological character of these slaty rocks, and their apparent relations to the underlying Laurentian gneiss, are stated in Mr. Bell's report. It may, however, be remarked that though the facts observed undoubtedly lead to the conclusion, as stated by Mr. Bell, that the two series are in conformable

Schistose and slaty strata overlying Laurentian gneiss.

sequence, yet it is far from improbable that this apparent conformity is only local, and that the result of a more extended and detailed investigation of the structure would serve to shew that there is in reality a very considerable break and much unconformity between the Laurentian gneiss and the overlying schistose and slaty strata. As regards the age of these so-called Huronian rocks, the evidence is not of the most satisfactory kind. While stratigraphically they rest directly upon highly crystalline and typical Laurentian gneisses, mineralogically they resemble as closely the chloritic, epidotic and dioritic strata of the altered Quebec group as they do those which on the shores of Lakes Huron and Superior are referred to the Huronian series.

Resemblance to rocks of the Quebec group.

A similar series of rocks occurs, as shown by the researches of Mr. James Richardson and of Mr. Walter McOuat, of the geological corps, in the regions lately explored by them around Lakes Mistassini and Abbitibbé. It is similarly related to the Laurentian gneisses, and associated with it there are serpentine and green schists holding magnetite in crystalline grains, and in the serpentine from Misstassini and Abbitibbe, both chrome and nickel have been detected; in the former by Dr. Hunt and in the latter by Dr. Harrington. The only organic form which has as yet been found associated with these rocks is the obscure coral mentioned in Mr. Richardson's report. [Geology of Canada, Report of Progress, 1870-71, page 294.] Notwithstanding this, and that Mr. McOuat failed to find any fossiliferous beds associated with the Abbitibbé rocks, yet I think there is not much room for doubting that the green schists of the Mistassini region are of the same age as those of Lake Abbitibbé; and as we have associated with the former serpentinous limestones holding corals, pronounced both by Dr. Dawson and Mr. Billings to be either *Tetradium* or *Favosites*, and the whole mineral aspect of the formations in both localities closely resembles that of portions of the altered Quebec group, it seems not improbable that they may be of the same age; and if so, then it becomes a question, in what way they are related to the Huronian series of Lakes Huron and Superior, as well as to the great bands of somewhat similar rocks which we find traversing, in a W. S. W. and E. N. E. direction, the entire region between Lake Superior and Red River. This very interesting and important question can only be determined by further minute and careful investigation: but whatever their geological age may be, their presence exerts a marked beneficial influence on the physical character and on the general fertility of the country where they occupy the surface. This fact in relation to a portion of two of the bands which we observed west of Lake Superior, was noticed by Professor Keating in 1823, who writes respecting these as follows: \*

Rocks between Lake Superior and Red River.

\* Narrative of an Expedition to the Source of St. Peter's River, performed in the year 1823.

“After passing Jack’s Falls, a great change in the appearance of the river was observed, and was distinctly traced to a difference in the rock. The granite and syenite were replaced by a slate, which appeared to vary from a mica to a clay slate, presenting chiefly the character of the latter. It is very distinctly stratified. The strata are nearly vertical. Its junction with the granite was observed in many places; the slate was superposed. The hills which we had observed above Bonnet Lake did not continue after the slate had made its appearance. A corresponding change in the features of the stream is observed. The river expands considerably, being in some places several miles wide; it includes a great number of islands, all of which have a solid rocky foundation. The color of the rock is of a deep blue, or black, imparting the same hue to the water. The river is not deep, its current is swift, especially near the islands, but it is free from ripples. We observed none of the foaming rapids which characterized the lower part of the stream. The islands which in some places are countless, are generally small and of a form nearly square; from the vertical stratification of the rock their banks are perpendicular; they generally rise from ten to twenty feet above the level of the water. Their surface is covered with a thick growth of trees, which are for the most part, however, small. They consist of a dwarf species of pitch-pine, spruce, juniper, tamarack, &c.; the white birch becomes more abundant; the undergrowth is very luxuriant. The soil appears much better than that on the granite. In some parts the rock appears covered with a ferruginous incrustation, produced probably by the decomposition of iron pyrites which abounds in it. The difference in the rocks did not continue long, for after having travelled about fifteen miles the slate ceased, and was replaced by granite which soon passed into a decided syenite, producing a wilder and more uninhabitable country than any we had as yet seen. The syenite rises apparently in great confusion in steep masses which are rounded at their summit, they are covered with moss and support but a very thin growth of scrubby pines on their surface.

“Previous to our arrival at Rat Portage, we observed that the rocks had again changed to a slate of which the stratification was very distinctly directed from east-north-east to west-south-west. The inclination was nearly a vertical one; the color of the slate is a dark green; it is very decidedly a micaceous slate, at least on Rat Portage. This produces the same feature which we had observed on the Winnipeg River above Jack’s Falls, but which becomes more distinct in the Lake of the Woods.”

Apart from the geological interest which attaches to the determination of the distribution of these rocks and of their precise relations to the underlying Laurentian gneiss, the foregoing facts shew that it is economically important that the extent of these bands should be defined; and that their mineral characters should be closely investigated is equally so, inasmuch



Mineral deposits  
and soil.

as the gold, the copper and the iron of the region, as far as known, are associated with similar strata, and thus, not only the best land, but likewise valuable mineral deposits are to be looked for within the limits which they occupy.

Route between  
Lac des Mille  
Lacs and Lake  
Winnipeg.

Except such as arises from causes connected with the presence of Huronian rocks as above described, or with the occurrence of superficial deposits of sand, clay, etc., but little variation is perceived in the general aspect of the country on the route which we traversed between Lac des Mille Lacs and Lake Winnipeg. On the mainland, and on the innumerable islands, the shores of the lakes and rivers very generally present bare rock surfaces. Bold cliffs and precipices are rare; the rocks either rise abruptly from the water for fifteen or twenty feet, or else slope gently upward, till, above the line of highest flood, they are concealed beneath a thin coating of moss-covered soil, supporting a thick undergrowth of brushwood, and a forest of poplar, aspen, birch, spruce and small tamarack, with occasionally a few red pine trees, standing singly or in small clumps, and which, though considerably taller than the rest of the forest, and hence conspicuous at a distance, are rarely of large size. The generally small size of the timber, however, is evidently not altogether due to the effect of unfavorable soil and climate, but in a great measure to the fact that nearly all the older trees have been destroyed by the successive fires which at one time or other have devastated every part of the country, and the effects of which are often conspicuously marked by the tall, dead branches and partially charred trunks which still tower above the younger forest. There are no prominent hills or even ridges; the highest elevations do not probably exceed four or five hundred feet above the intervening waters; and I think it is no exaggeration to say that the latter occupy fully one half of the whole surface area of the region. The surface is generally broken and undulating, and often rocky, but occasionally both lakes and rivers, are bordered either by extensive swampy flats or by banks of stratified sand, silt and clay, which often rise terrace-like at a short distance from the water's edge. The point on which the Lonely Lake Post stands is formed of these deposits, and to the westward of the Post, along the north shore, they are exposed in cliff sections for several miles. At the junction of the Mattawa and the English Rivers, where a small Indian Village and trading post is situated, presided over by Chief Pierre, there are similar banks of sand and sandy clay, resting on the ordinary grey Laurentian gneiss, which is exposed along the water's edge. The banks here rise steeply to about thirty feet above the water, and for some distance inland the country seems to be tolerably level, and the soil on this part of the river appears to be generally of fair quality. Small patches of it are cultivated by the Indians, who succeed in raising excellent potatoes, carrots and onions, and there is no doubt that many other crops

Small size of  
timber.

Absence of prom-  
inent hills, and  
extent of area  
occupied by  
water.

Crops raised by  
the Indians.

would flourish equally well, and would be cultivated by them if they were supplied with seed. Throughout the region, especially from Sturgeon Lake westward to Lake Winnipeg, there are considerable areas of soil <sup>Areas suitable for cultivation.</sup> suitable for cultivation.

The sands and clays, which for the most part form the soil of these cultivable areas, appear to be more widely distributed in the valley of the English River than they are in that of the Winnipeg. Professor Hind says:\* "The Winnipeg River, until within a few miles from its mouth, flows through a desolate and irreclaimable rocky waste, furnishing a very small supply of timber for lumbering purposes in proportion to its length of 163 miles." This description applies equally to some parts of the English River, but the greater prevalence above alluded to of the superficial deposits in the valley of the latter appears to be accompanied by a corresponding amelioration in the character of the country. The same author remarks that "small patches, varying from 50 to 300 acres, of excellent drift clay occur at and below Islington Mission, but within a few miles of the mouth of the river an extensive area of good arable land is to be found." Islington is on the Winnipeg River about twelve miles above its confluence with the English River. On the lower part of the Winnipeg River, and around the south-eastern shore of Lake Winnipeg, the banks and cliffs, which are entirely composed of these drift deposits, form a very prominent feature.

Occasionally the cliffs are nearly perpendicular, and as much as fifty or sixty feet high. The sections which they afford shew alternating beds of <sup>Sections of</sup> fine and coarse sand, silt or mud and sandy clay. At most of the points <sup>cliffs.</sup> and headlands, and in some of the bays where such cliff sections occur, the shore beneath is often thickly piled with small and large transported stones and masses of rock. Inland, similar stones and rock masses are found to be somewhat thinly and irregularly distributed, either resting on the surface or partially imbedded in the soil. Their distribution has clearly taken place long after the formation of the deposits upon which they rest, as their position is always on or beneath, and not in the cliffs, and it would seem that their accumulation upon the shores and at the points and headlands as described is the result of a twofold action. The wearing away and breaking down of the sand and clay cliffs by atmospheric causes brings the boulders within the influence of the waters of the lake, while their piling up in certain places may probably be explained by the shoving action of the ice upon the shores when breaking up in the spring. Respecting these deposits on the shores of Lake Winnipeg, Professor Hind writes :† "About five miles further south, I ascended a cliff, fifty feet high, consisting of <sup>Gigantic</sup> stratified sand and marl, in which were imbedded primitive boulders of <sup>boulders.</sup>

\* Report on the Canadian Red River Exploring Expedition, 1857.

† Ibid. page 252.

most gigantic dimensions. Some of them measured twelve to fifteen feet through; they were all water-worn and distributed throughout the cliff. The base of the cliff was well protected by an immense accumulation of these erratics which had fallen from the loose sand of the cliff."

From the foregoing it will be seen that the opinion of Professor Hind regarding the relation of those enormous boulders to the sand and clay deposits, differs from that which I formed respecting them. In support of my own view of the matter, I may say that in the only sections which I examined where the cliffs were sufficiently steep to prevent the lodgement on the slope of boulders falling from above, or presented vertical sections, I saw no boulders except at the base and on the summit.

Fossils.

A few fossils were collected from loose fragments of limestone on the shores of Lake Winnipeg, and also from rock in position at the Stone Fort on Red River. Among them are several specimens of a lingula which Mr. Billings says is probably *Lingula Coburgensis*. That the Red River limestones are of the age of the Trenton group, has already been determined.

ALFRED R. C. SELWYN.

Montreal, May, 1873.