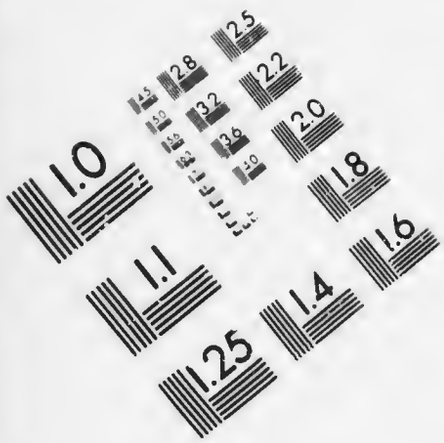

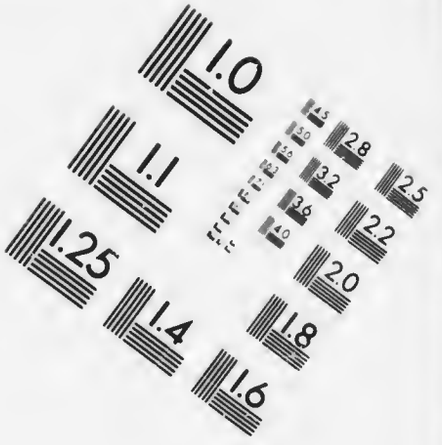

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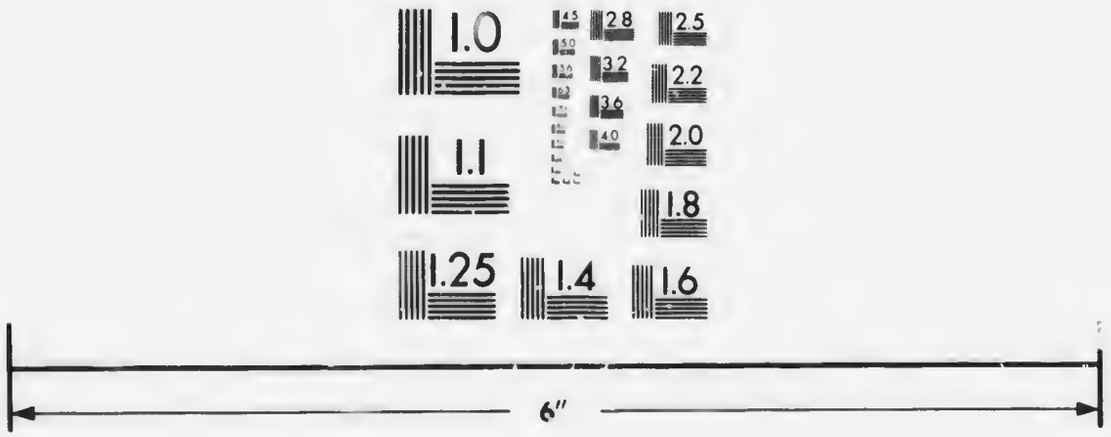

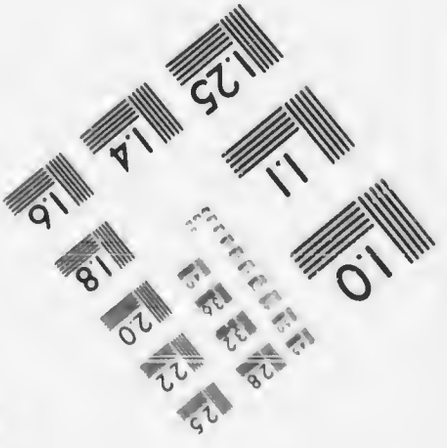

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GEOLOGICAL AND NATURAL HISTORY SURVEY OF CANADA
ALFRED R. C. SELWYN, LL.D., F.R.S., DIRECTOR.

OBSERVATIONS

ON THE

GEOLOGY, MINERALOGY, ZOOLOGY AND BOTANY

OF THE

LABRADOR COAST, HUDSON'S STRAIT AND BAY.

BY

ROBERT BELL, M.D., LL.D., B.A.Sc., F.R.S.C.

PUBLISHED BY AUTHORITY OF PARLIAMENT.

MONTREAL.
DAWSON BROTHERS.
1884.

OTTAWA, 24th November, 1884.

A. R. C. SELWYN, LL.D., F.R.S.

Sir,—Herewith I beg to submit my Report as Geologist and Naturalist on the Hudson's Bay Expedition, sent out by the Government of Canada during the present season.

I have the honour to be,

Sir,

Your obedient servant,

ROBERT BELL.

OBSERVATIONS

ON THE

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LABRADOR COAST, HUDSON'S STRAIT AND BAY.

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ROBERT BELL, M.D., LL.D., B.A.Sc., F.R.S.C.

The question of sending a party by sea into Hudson's Bay, for scientific purposes, at the expense of the Government, has been before the public of Canada for some years. Without entering into the subject of the various useful purposes which it was believed such a party might accomplish, it may be stated that the main object of the expedition, sent out by steamship the present season, was to establish six observatory stations on the shores of Hudson's Strait. The parties to be left in charge of these stations were to remain one year and to keep regular meteorological records, and to note all seasonal events, especially with regard to the condition of the strait itself in winter, the tidal phenomena, &c., all with a view to throw additional light on questions regarding the navigation of these waters. If time permitted, after having built the stations, the vessel was to visit certain parts of Hudson's Bay. Without interfering with the above mentioned objects, the expedition would afford an opportunity for obtaining much desirable information in regard to the geology and mineralogy and the zoology and botany of the places which might be visited. The writer, who had been on Hudson's Bay in previous years, and who had already passed through the strait (see Report of the Geological Survey for 1879-80), was selected for this duty, and also to act as medical officer to the expedition. I also acted as taxidermist and photographer for geological purposes, and provided myself with the instruments necessary for various methods of surveying, in case opportunities for using them should occur.

Objects of the expedition.

The expedition was essentially a meteorological one, and Lieut. A. R. Gordon, R.N., of this branch of the public service, was selected for the command; and the general management fell within the province of the Department of Marine. Notwithstanding that I had neither men nor boat at my command, I managed, while the stations were being built, or while the ship was taking in ballast, to get ashore with the boats that were passing backward and forward between the vessel and the land, and in some cases I had the use of a boat and the assistance of officers and men, both of the expedition and of the ship's company.

The following letter from the Deputy Minister of Marine, in reply to one from Dr. Selwyn, will best explain my position with regard to the facilities to be expected:

"DEPARTMENT OF MARINE AND FISHERIES,

"OTTAWA, 20th June, 1884.

"SIR,—I have to acknowledge receipt of your letter of the 18th instant, making certain enquiries in regard to the Hudson's Bay Expedition and the employment of Dr. Bell, and in reply I am to inform you that the vessel will sail from Halifax about the 21st of next month. Nothing beyond board and berth accommodation can be given Dr. Bell, the vessel being chartered to the Department, and no special accommodation being guaranteed, but space will doubtless be provided sufficient for the storage of any specimens, &c., which Dr. Bell may collect or the stores provided for the preservation of the same. With reference to your enquiry as to what assistance, as regards men and boats, can be provided for Dr. Bell's work, I have to inform you that Dr. Bell will have the opportunity of landing at every place at which the vessel may call, and every facility will be given him which the officer in charge may consider he is able to afford without prejudicing the primary objects of the Expedition, but no special boat or crew can be furnished for Dr. Bell's use. I am also to inform you that it is the intention that the vessel shall return this fall, but it is impossible to state positively that she will. I am also to state that no charge will be made for Dr. Bell's maintenance while on board the vessel.

"I am, Sir,

"Your most obedient servant,

"W. SMITH,

"*Deputy Minister of Marine, &c.*"

A. R. C. SELWYN, ESQ., LL.D., F.R.S.,
Director Geological and Natural History Survey.

Report of Lieut. Gordon.

The route followed by the expedition, in going out and returning home, together with a full narrative of occurrences, will no doubt be given in the report of Lieut. Gordon to the Minister of Marine; but in

order to make the present report intelligible by itself, it will be necessary for me here to give a brief sketch of the round voyage.

The vessel which had been chartered by the Government for this service was the steamship "Neptune," belonging to the Messrs. Job Brothers, of St. John's, a wooden vessel of 684 tons burden, which had been built and fitted for the seal fishery. She was navigated by Captain William Sopp, as sailing master, and a competent staff of officers and men. We sailed from Halifax on the 22nd of July, our course lying between Cape North and Cape Ray, and through the Gulf of St. Lawrence and the Strait of Belle Ile. We anchored for an hour at Blanc Sablon, on the north shore, but did not land. On the way up the Labrador coast, we called at Ford's Harbour, Nain and Natchvak, for the purpose of engaging an Eskimo interpreter, which we succeeded in doing at the last named place.

Observatory stations, and routes followed.

The first station was built on the north-west point of the promontory between Ungava Bay and the Atlantic, or near Cape Chudleigh. The second station was to have been placed on the southern or western part of Resolution Island, but we did not succeed in finding a harbour on these shores, and could not land on account of the stormy weather; but we got a near view of the west coast of the island, and also of some of the Lower Savage Islands. We therefore proceeded to the locality which had been determined on for the third station, and found a suitable place on the south side of Big Island, which is just west of the Upper Savage Islands, at an inlet about two miles east of North Bluff. We next crossed the strait to Cape Prince of Wales, south south-west of North Bluff, and erected a station on the shore of the bay, inside of the cape, or on its eastern side. From this place we next made the south point of Nottingham Island, and established a fourth observatory. Again crossing the strait in a southerly direction, we passed close to Digges Island, and coasted down the eastern side of Mansfield Island, looking for a suitable place for another station, but without success. The south-east shore of Southampton Island was also coasted for some distance, after which we traversed the northern part of Hudson's Bay to the entrance of Chesterfield Inlet. We did not land in this neighbourhood, however, but turned south, and called at Marble Island, where we anchored and spent one day ashore. From this island we made Cape Churchill, and then entered the harbour of the same name, at the mouth of the Churchill River. A short visit was paid to York Factory, from which we recrossed Hudson's Bay to Digges Island, where a fifth station was built. On our homeward voyage through Hudson's Strait, we visited all the other stations in the reverse order in which they had been established. Another attempt was made to stop at Resolution Island, in order to build a station, but again without

success. It was then decided to place the party intended for Resolution Island at Nachvak Inlet, and we called there for this purpose and to leave our Eskimo interpreter, on our way to St. John's, which we reached on the 11th of October, and immediately handed the ship over to her owners, four days before the date fixed for the expiration of the charter. On the morning of our arrival at St. John's, we happened to catch a steamer for Halifax, and so were enabled to continue our homeward journey without an hour's delay.

Nature of information obtained.

Before proceeding to give details of my special work, I may say that at every place we visited I obtained as full notes as my opportunities would permit in regard to the geology and mineralogy of the surrounding country. I also endeavoured to obtain from the natives information as to the occurrence of useful minerals, which, although not very definite, may in some cases lead to valuable discoveries. The Eskimo are intelligent and good observers, especially of such matters as affect their own mode of living and although rocks and minerals would not be expected to interest them much, still I found that in some instances they had taken notice of them. In order to facilitate enquiries, I had provided myself with a collection of all the ores, minerals and rocks which might be expected to occur in the regions we were to visit, and on allowing the natives to inspect them, they would point out those which they thought similar to certain kinds which they had noticed in their own districts. An interesting feature in the geological phenomena of these northern regions, is that a study of them will assist us in the elucidation of the superficial geology of the more southern portions of the Dominion, which forms so important a branch of the work of the Geological Survey.

Zoology.

In regard to zoology, efforts were constantly made to collect specimens in every class of animals and to obtain new information on all points with reference to them. Upwards of fifty specimens of mammals and birds were obtained, of which a portion were from Dr. Matthews, of York Factory. Some of these are rare and will prove to be very useful and interesting additions to our museum. Many notes were made on the habits and distribution of the mammals and birds. Attention was paid to the fishes and their food and to the subject of possible fisheries in these regions. A variety of molluscs and other invertebrates was secured by dredging. As we were living mostly on shipboard and in so cool a climate, but little could be done for the science of entomology. A small collection of butterflies and moths from the shores of Hudson's Strait have been identified by Mr. H. H. Lyman, a well known entomologist in Montreal. (Appendix V.) One of the missionaries on the Labrador coast has kindly promised to collect the Lepidoptera of that region and send them to me next year.

With regard to botany, as complete a collection of plants as possible was made at every place we touched at. These are in the hands of Professor Macoun and a catalogue of them will be found in Appendix I. Some new facts of interest in regard to the ranges of forest trees in the Labrador peninsula and the country west of Hudson's Bay were ascertained from persons acquainted with these regions. Botany. Forest trees.

In addition to the technical assistance already acknowledged above, I take this opportunity of mentioning that Professor C. Hart Merriam has kindly aided me in making out from my descriptions, the local names, &c., with which he is familiar, the list (Appendix II.) of the seals of Hudson's Bay and Strait. I may mention that Professor Merriam, who is justly regarded as a high authority on the Pinnapedia, has himself gone to the Newfoundland and Ladrador seal fishery, and travelled in the Gulf of St. Lawrence for the express purpose of studying these animals. It would appear from my observations that we have, in both Hudson's Bay and Strait, all the kinds of seals found at any season either in the gulf or on the coast of Newfoundland and Labrador; and from all that we could learn, both seals and walruses are abundant in the strait and the northern parts of the bay. But in order to obtain them in large numbers for commercial purposes, their various resorts and the course of their migrations at different seasons of the year would require to be studied. The gentlemen in charge of the observatory stations were instructed to attend to such matters, and their notes will probably throw some light on the subject in the particular localities at which they are stationed. In the list of fishes, I have included species which I had in previous years ascertained to exist in Hudson's Bay or the waters immediately connected with it. Mr. Lucien M. Turner, who has spent two years in the Ungava district in the interest of the Smithsonian Institution, has kindly determined some of the fishes which I collected, and added the names of others which he found in the district named. Assistance received from Professor H. Merriam. Seals. Mr. L. M. Turner.

I secured about sixty-five photographs of a uniform size of 8 by 5 inches. These are illustrative of subjects of interest in connection with the expedition, of the nature of the country and more especially of points bearing on its geology. Photographs.

I shall confine myself in the following pages to the subjects above referred to, as all others connected with the work of the expedition will probably be fully reported on by Lieut. Gordon. In regard to the arrangements to be adopted in this report, it has been considered best to state the facts and observations in the order in which they were noted, and in connection with them to give other information, bearing on the subjects referred to, which may have been gathered in previous years.

As already mentioned, we anchored for an hour at Blanc Sablon on the morning of the 26th of July. Here the horizontal strata of the Lower Silurian series form a conspicuous feature in the landscape. They are described at pages 287 and 288 of the *Geology of Canada* as consisting of 231 feet of red and grey sandstones and fine conglomerates forming the lower part of the section, with 143 feet of grey, reddish and greenish limestones resting upon them. In Forteau Bay, a short distance east of Blanc Sablon, a considerable collection of fossils was made in these limestones by the late Mr. James Richardson, which proves them to be equivalent to the Red Sand-rock of Vermont. The Laurentian gneiss may be seen cropping out from beneath these sandstones at and near the sea shore, while the hills of the same formation rise above the level of the summit of the horizontal strata all along in the interior.

Castle and Henley Islands.

At the entrance to Chateau Bay on the Labrador side of the Strait of Belle Ile, opposite to the northern extremity of Newfoundland, are two islands, called Castle and Henley's Islands, which are capped by flat basaltic summits, the former being 200 feet above the sea.† They form a striking contrast to the prevailing character of the shore rocks, which everywhere else in the neighbourhood appear to be of Laurentian gneiss. Later in the season I was informed that some men had been mining mica on the shore of this bay, and in the autumn had brought about one ton of the mineral to St. John's, on the way to Boston or New York, but that the plates did not exceed three by six inches in size, and that they were of a rather dark colour.

After passing the Strait of Belle Ile, the Labrador coast continues high and rugged, and although there are some interruptions to the general rule, the elevation of the land near the coast may be said to increase gradually in going northward, until within seventy statute miles of Cape Chudleigh, where it has attained a height of about 6,000 feet above the sea. Beyond this, it again diminishes to this cape, where it is 1,500′. From what I have seen of the Labrador, and from what I have been able to learn through published accounts, Hudson's Bay Company's officers and the natives, and also judging from the indications afforded by the courses of the rivers and streams, the highest land of the peninsula lies near the coast all along, constituting, in fact, a regular range of mountains, parallel to the Atlantic sea-board. In a general way, this range becomes progressively narrower from Hamilton Inlet to Cape Chudleigh.

High mountain range.

† These are probably outlying remnants of extensive lava streams of Lower Cambrian age like those of Lake Superior, Lake Nepigon and the east coast of Hudson's Bay.—A. R. C. Selwyn.

The distance from the Strait of Belle Ile to Cape Chudleigh, along the Labrador coast, is 760 English statute miles. This is divided into three principal courses, as follows: From Belle Ile to Poreupine Bay, due north (true), 120 miles; from Poreupine Bay to Nain, north-west (true), 290 miles; from Nain to Cape Chudleigh, north north-west (true), 350 miles. The coast-line is everywhere indented by inlets or fjords, and fringed with islands of all sizes, from mere rocks up to some measuring twenty-five miles in length. Most of the fjords are narrow and about twenty-five miles long; several are thirty-five miles, and Hamilton Inlet runs in from the open sea a distance of 160 miles. The general bearing of the fjords is at right angles to the coast line in the neighbourhood. In a great many cases the islands are separated from one another, or from points on the mainland, by very narrow straits, with deep water, which have received the name of "tickles." With regard to the condition below the level of the sea, it is stated in the *Newfoundland Pilot*, published by the Admiralty, that the shores from Davis' Inlet to Nachvak are comparatively free from reefs and sunken rocks, but that from Nachvak to Cape Chudleigh they are fringed with inlets and rocks, to an average distance of five miles out. The coast of Resolution Island seems to be similarly studded with these impediments to navigation, and these circumstances appear to be connected with certain geological conditions, which will be referred to further on.

Belle Ile to Cape Chudleigh

Fjords.

In approaching Ford's Harbour, which is on the eastern point of Paul's Island, the islands near which we passed consisted of bare rock, and although usually high and steep, they had rounded or glaciated outlines. Numerous perched boulders lay about, either singly or in groups or rows, on the naked surface of the rock, wherever they could find a resting place. A short distance off the entrance of the harbour, we passed an island which, on the top and one side, was literally piled with rounded boulders. On this island I noticed a dyke of trap about 100 feet thick, cutting the gneiss in a west-north-westerly direction. On going ashore at Ford's Harbour, I found the gneiss to consist of common reddish and greyish varieties, some parts of it massive and others more finely and distinctly laminated. The average strike was south-east (true). The glacial striæ were quite distinct in many parts, but were best preserved near the shore. They run in two principal directions, S. 45° E., and S. 80° E. (mag.) Perched boulders were observed on all the surrounding hills. In going from Ford's Harbour to Nain we followed the channel on the north side of Paul's Island. The rock appeared to be dark, massive and crystalline.

Ford's Harbour and Nain.

Trap dyke.

Our stay at Nain was so short that I had only time to examine the high ridge or mountain to the north and north-west of the Missio Station. The first shoulder of this ridge, we were informed, has a

height of 875 feet above the sea, but the summit, a short distance further inland, must be at least 200 feet higher. The rock here consists of a rather light grey gneiss, which strikes S. 45° E. (mag.) The glacial striæ, which were seen with greater or less distinctness, all the way to the summit, run S. 65° E. (mag.) or about parallel to the valley which extends inland from the head of the fjord up which we had sailed to Nain, and with the same general bearing. Well rounded boulders were scattered over the flanks and summit of this high ridge; and they were quite prominent on the high bare hills on both sides of the inlet, all the way from Ford's Harbour. The appearance of the top of this mountain, with the boulders resting on the bare, sloping rock, is shown in one of the photographs taken at this spot. Mountains of equal and greater height were seen in all directions from this summit, except towards the eastward, where they die down to the sea level in the distance. On the next hill to the north-west, the weathered surface of the rock showed a rusty belt of a brownish colour, and of considerable extent, which was supposed to be due to iron pyrites. I was informed by the Moravian missionaries at Nain that the labradorite of this part of the coast is to be found at different places on Paul's Island, and at a fresh-water lake called Nunaingok, which lies at no great distance inland from the head of a bay to the north-westward of Nain. They said it was also reported to occur on a bay a short distance to the southward. I had not an opportunity of visiting any of these localities, but from specimens which I have seen, I have little doubt the mineral occurs as veinstones, in which there are also crystals of pyroxene, iron pyrites and magnetic iron. In this connection it may be mentioned that I have seen a large specimen of coarsely crystalline labradorite rock from Hamilton Inlet, in which some of the faces showed a blue iridescence. The rose-red variety of anorthosite, called latrobite by Gmelin, is stated to come from an island called Amitok, on the old charts of the Labrador coast, about forty-five miles northward from Nachvak. When at Nain I obtained specimens of amazon stone, which the Eskimo told me came from Port Manvers, and of paulite, a variety of pyroxene or hypersthene, which has also been called "Labrador hornblende" and "metalloidal diallage." It was said to have been brought from Paul's Island. Mr. John Ford informed me that yellow mica, in flakes about the size of one's hand, was found on this island, about two miles north-westward of Ford's Harbour. In regard to the rocks and minerals of the Labrador coast, the following notes may be here given: I have received specimens of copper pyrites in a dark slate, which were labelled as having come from Indian Island, on the north side of the entrance of Hamilton Inlet, and I have been otherwise informed that slates or schists occur in that neighbourhood. A

Labradorite.

Amazon stone and paulite

man from Nova Scotia stated to me that he had been engaged, with others, two years ago, in mining copper and lead ores on Deadman's Island, which is situated a few miles north of Hamilton Inlet. They occurred in a vein between a rock like granite and a sort of sandstone or quartzite. Mr. King, the second mate of the "Neptune," said that copper ore was also found at Iron-bound Island or "Makoubik" (probably Makkovik of the chart) not far from Cape Harrison. One of the gentlemen we met at Nain informed me that he had heard of copper ore being found somewhere to the southward of that place, but was not aware of the locality. These circumstances point to the possible occurrence of deposits of copper in quantities of economic value on this coast. It is well known that productive mines of copper were in operation for a number of years on the adjacent coast of Newfoundland. Ores of copper and lead.

At Nain I noticed some freshly split slabs of a grey felsitic slate, which were being used as flag stones, and, on inquiring, was informed that they had been brought from Ramah, in the bay next south of Nachvak, where there was said to be plenty of this rock in situ. The name of the bay is Nullataktok, or Slate Bay. Our Eskimo interpreter, Lane, who was well acquainted with this bay, afterwards informed me that slaty rocks were abundant there.

While at Ford's Harbour and Nain I collected as many plants as the limited time would permit, and Professor Macoun's list of them will be found in appendix I. The Rev. Dr. S. Weiz, who had long resided at Nain, had made a collection of the plants of the vicinity, which he had submitted to some of the leading botanists of Europe, who had attached the proper name to each specimen. He kindly allowed me to make a list of these and it is also given in appendix I., in one of the columns of the general list. Plants collected at Ford's Harbour and Nain.

Although timber disappeared from the outer coast before reaching Nain, yet groves of trees may be seen in the valleys and on the more favourable slopes at the heads of the inlets, and we were informed that after going ten to twenty miles inland from Nain, or from the coast for a considerable distance north of it, the whole country may be said to be wooded, as far as the condition of the surface will permit of the growth of trees, and that in favourable situations the spruce and tamarac attain a sufficient size to be sawn into lumber. At Nain, the trees consist of spruce, tamarac, and small willows, but at no great distance inland, balsam fir, poplar, white birch and rowan begin to make their appearance.

In the gardens at Nain I observed the following vegetables: potatoes (a variety with low, flat, spreading tops), turnips, carrots, beets, cabbage, scotch kail, a very rank variety of spinach, lettuce, peas, beans Vegetables at Nain.

and onions. There was also a great variety of flowers. The peas and beans were arranged so that they could be protected by glass if requisite, and the potatoes were planted in narrow beds, arched over with bent rods, so that long sheets of coarse canvas could be thrown over them on frosty nights.

Nachvak Inlet. Leaving Nain, our next stopping place was the Inlet of Nachvak, about 140 miles south of Cape Chudleigh. This inlet or fjord, with an average breadth of from a mile to two miles, runs in from the open sea a distance of about forty statute miles. The water in it is very deep, and the mountains on either side immediately overlooking it rise to heights of from 1,500 to 3,400 feet, but a few miles inland, especially on the south side, they appear to attain an altitude of 5,000 to 6,000 feet, which would correspond with the height of The Four Peaks, near the outer coast-line, about midway between Nachvak and Cape Chudleigh. The mountains around Nachvak are steep, rough sided, peaked and serrated, and have no appearance of having been glaciated, excepting close to the sea-level. The rocks are softened, eroded and deeply decayed. On precipices and steep slopes the stratification is well brought out by the weathering, so that the dips may be distinctly seen. The mountains on the north side proved to be mostly Laurentian gneiss, notwithstanding their extraordinary appearance, so different from the smooth, solid and more or less rounded outlines of the hills composed of these rocks in most other parts of the Dominion. On the present occasion we stopped only at the Hudson's Bay Company's post, at a narrow part of the fjord, about twenty miles in from the open sea, and I had a few hours to examine the rocks, collect plants and take photographs in the neighbourhood. But in returning, in the month of October, we stayed for several days at a bight on the north side, a few miles from the entrance, where we placed a station, and named the place Skynner's Cove. This enabled me to extend my explorations of the neighbourhood, and I shall now state the results of my observations on both occasions.

On the south side of the inlet at the Hudson's Bay Company's post, an escarpment rises to a height of 3,400 feet, as ascertained by Commander J. G. Bolton, R. N., but I had not time to visit it to determine the nature of the rock. A brook, which gathers its waters from higher ground further back, but which is not visible from the post, precipitates itself from the top of this great precipice in an almost perpendicular fall. The rock on the north side at this place consists of reddish gneiss, somewhat contorted and occasionally interstratified with dark micaceous layers. Two or three miles east of the post a good sized brook falls, in several almost perpendicular leaps, a height of 300 or 400 feet over these rocks. The strike of the gneiss in the neighbourhood of the falls is S. 35° W. (true.)

VIEW FROM THE HUDSON'S BAY COMPANY'S POST IN NAJHVAK INLET LABRADOR

SHOWING THE PRECIPITOUS CHARACTER OF THE LAURENTIAN MOUNTAIN

TABLE III.—ULTIMATE ANALYSES OF COALS AND LIGNITES FROM THE NORTH-WEST TERRITORY.

No. of Specimen.	LOCALITY	Composition, per Cent.						Calorific Power I. Experimental.		Calorific Power II. Theoretical.			
								1	2	A		B	
		Carbon.	Hydrogen.	Oxygen and Nitrogen.	Sulphur.	Ash.	Hygroscopic Water.	Expressed in calories.	Weight of Water (at 100° C.) evaporated by 1 lb. of fuel.	Expressed in calories.	Weight of Water (at 100° C.) evaporated by 1 lb. of fuel.	Expressed in calories.	Weight of Water (at 100° C.) evaporated by 1 lb. of fuel.
2	South Saskatchewan, south side, about ten miles above Medicine Hat—Lower seam.....	54.35	3.34	17.52	0.67	7.30	16.82	5144	9.57 lbs.	4842	9.02 lbs.	4654	8.67 lbs.
22	Belly River, five miles below the mouth of Little Bow River...	62.39	3.99	16.82	0.77	6.85	9.18	5821	10.84 "	5744	10.70 "	5600	10.43 "
26	Belly River—from the main seam at "Coal Banks".....	65.30	4.30	15.65	0.70	7.55	6.50	6183	11.51 "	6137	11.43 "	6015	11.20 "
28	Bow River, at Coal Creek, between Morley and Calgary....	62.59	4.13	12.60	0.44	15.31	4.93	5874	10.93 "	5991	11.16 "	5896	10.98 "
29	Old Man River, North Fork, one and a-half miles from the base of the Rocky Mountains. ...	65.71	3.56	8.76	0.26	19.86	1.75	6082	11.32 "	6212	11.57 "	6157	11.46 "
30	Old Man River, Middle Fork, upper seam.....	59.84	4.17	12.35	0.55	19.82	3.27	5980	11.13 "	5793	10.79 "	5708	10.63 "
31	Old Man River, Middle Fork, lower seam.....	71.11	5.04	11.63	0.66	9.20	2.36	7020	13.06 "	7038	13.11 "	6962	12.96 "
32	Upper Belly River, twenty-five and a-half miles above the mouth of Kootanie River....	66.19	4.43	11.96	2.18	11.33	3.91	6604	12.29 "	6413	11.94 "	6327	11.78 "
33	Vancouver Island, British Columbia, "Wellington Mine," Newcastle seam.....	72.65	4.89	12.77	0.36	6.58	2.75	7204	13.41 "	7059	13.14 "	6974	12.99 "
35	Mill Creek, about four miles above the mill.....	71.57	4.05	9.94	0.44	12.37	1.63	6604	12.29 "	6806	12.67 "	6745	12.56 "

At a point on the north side, estimated to be about nine miles from the open sea and eleven from the post, opposite to a bay on the south side, a mountain rises steeply to a height of 1,500 or 2,000 feet. It is composed of gneiss standing vertically and striking N. 25° W. (true), cut diagonally by a great many dykes of dark trap all underlying westward at an average angle of about 30° from the perpendicular. Some of them run together and others appear to die out in both directions on the cliff section. Some dykes of close-grained, almost black diorite, also cut the gneiss in the vicinity of Skynner's Cove. From the point above named to Skynner's Cove the rock along the north side appears to be all gneiss with a variable strike in different parts. Around this cove there is a variety of micaceous, and hornblendic schists passing into thinly bedded gneiss. The average strike is about S. W. (true). I was informed by our interpreter, whose home is on the south side of the inlet, that the Eskimo obtained a kind of soapstone for making their pots, in the vicinity of Skynner's Cove, before they were able to procure others of metal. Along the northern part of the entrance to the inlet or about North Head of the chart, the rock is a coarse, dull red, syenitic gneiss. At one place it encloses a mass, like a bed, of nearly white quartzite marbled with small elongated gray patches, but it appears to be cut off as it runs up the slope, although another exposure of white rock was seen some distance off in a north-easterly direction. Here the glacial striæ were seen on projecting points near the water, running with the axis of the inlet or about east. At Mount Razor-back, which forms the outer point on the north side of the Nachvak Inlet the stratification is well seen, the dip being to the southward. The angle of dip on the outer or eastern part of the mountain is almost 60°, but this diminishes to 45° and finally to less than 10°. in going to the south-westward. Several large but somewhat irregular dykes of black-looking rock cut the strata of the mountain side at right angles to the dip in its varying inclinations.

Soapstone.

Trap dykes.

On the opposite or south side of the entrance of Nachvak Inlet, the dip of the bedding is S.S.W. (true), and the inclination, generally from 35° to 40°, but at one part it is 60°. Dykes were seen all along, cutting the face of the mountain range and running in a south-easterly direction.

On the west shore of the first cove, from the entrance, on the south side of Nachvak inlet, the rocks consist of a coarse-grained slaty tufa or breccia, thickly studded with grains of quartz-opal. To the north, this passes into a sort of coarse cleavable grey syenite, which could be traced for two miles westward along the shore; while to the south of it is a coarse grey mica schist, running N. 25° W. (mag.) vertical. In this rock, and near the slaty breccia, a vein of quartz was found, from

a foot to two feet in thickness, and holding patches of brown-weathering calespar. The rocks in the mountain, overlooking the south side of the inlet, opposite Skynner's Cove, have a slaty appearance, with some great bands of a light color and more solid aspect, the outcrop running nearly horizontally for some distance. I was unable to visit these bands, but our interpreter brought me a specimen, which he said he had broken off one of them, and which proved to be a fine-grained light grey, silicious schist, which makes excellent hones. These and the other rocks on the south side of the inlet in this neighborhood, which have just been described, as well as a part of those on the north side, may belong to the Huronian series. Slaty rocks have been mentioned as occurring at Ramah, in the inlet, about twenty miles south of Nachvak. From the specimens which I have seen, these are probably of the same age, and they may be connected as one area with the supposed Huronian strata of Nachvak.

Huronian rocks.

We were informed, both by Mr. George Ford, the agent of the Hudson's Bay Company at Nachvak, and our Eskimo interpreter, that at a short distance beyond the more distant mountains, seen to the west of the company's post, the country falls rapidly on the inland side, and soon becomes comparatively level. This description agrees with other accounts of the interior of the Labrador in the Ungava district. A wide level tract embracing the country drained by the George, the Whale and the Koksok, South, Big or Ungava Rivers, is said to extend southward a long distance from Ungava Bay. The surface is said to be covered with a wet, peaty moss, growing upon barren sand, with the solid rock everywhere at a short depth beneath. The rivers and brooks are fringed with spruce and tamarac trees, but very little timber is to be met with between them. The mouth of the Ungava River is 155 miles south-west of Cape Chudleigh. In going by sea, from one to the other, Commander Bolton says, in the Newfoundland *Pilot*: "The highland of the Labrador shore could be seen towering above the scarcely discernible shore of Ungava Bay, for the first sixty or seventy miles." The Ungava River is navigable for sea-going vessels to a point three or four miles above the Hudson's Bay Company's post, Fort Chimo, and boats may ascend it for seventy or eighty miles. The river is from one-quarter of a mile to a mile and a-quarter wide. Its upward course is S. by E. (true), and it passes through a barren undulating country. Spring tides at Fort Chimo rise 38½ feet, and the rapid currents produce dangerous whirlpools. Salmon frequent the rivers of Ungava Bay in great numbers, and for some years the Hudson's Bay Company have annually sent a cargo of them, in a frozen state, by a small steamship, to the London market, in addition to a considerable quantity of the salted fish. Besides salmon, the trade of this post consists of furs, seal

Level country inland.

Tides.

and white porpoise oil, and deer skins, and is carried on with the Eskimo of the coasts, Cree Indians from the south-western interior, and Nascopie Indians from the south-eastward.

Spruce timber begins to be met with, according to all accounts, about thirty miles to the south-west of the Hudson's Bay Company's post at Nachvak. The tamarac follows a short distance further south. To the westward of Nachvak, the northern limit of the spruce, according to Capt. William Kennedy, reaches the shore of Ungava Bay, north of the George River. On the western side of this bay the Eskimo informed me it begins to be found in the neighbourhood of Bay of Hope's Advance, or five days' journey south-eastward of Cape Prince of Wales, on the south side of Hudson's Strait, and that in this neighbourhood it was found further north in the interior than on the coast. In addition to spruce and tamarac, balsam-fir, canoe-birch, aspen and balsam poplar are reported, on good authority, to exist in the interior of northern Labrador, but at some distance further from the coasts of the Atlantic and the strait than the first mentioned. Spruce timber.

On the East-main coast of Hudson's Bay the northern limit of the spruce was found to be a few miles north of Richmond Gulf, but it was reported to extend much further north at a distance inland from this coast. On the west side of the Bay it was seen in considerable quantities all along the coast, from Cape Churchill to Button's Bay, and Mr. George McTavish, who has made several coasting voyages to the north, and who, at my request, has kindly made observations and collected information from the natives in regard to the distribution of timber, informs me that it leaves the shore about twenty miles beyond Seal River. He was told by the Eskimo of these parts, who travel a good deal in the interior, that spruce timber begins to be met with at two days (say fifty-five miles,) west of the mouth of Big River, and that it is considerably further inland, opposite to Eskimo Point, which is about in latitude 61° 40′. From this neighbourhood it runs west-north-westward and crosses the Coppermine River about twenty miles from its mouth, and thence reaches nearly to the mouth of the Mackenzie River.

On leaving Nachvak, we sailed up the coast, passed round Cape Chudleigh, through Gray's Strait, which is between it and the Button Islands, and entered Ungava Bay. According to the chart and the *Newfoundland Pilot*, the cape rises to a height of 1,500 feet above the sea, and the highest point of the Button Islands has an equal elevation. The outlines of these islands and of the southern shore of Gray's Strait, although bold and steep, are rounded, as if they had been glaciated. At the west end of the south-eastern island of the Button group a great rock has been excavated into the form of a half arch, which rises out of the water and rests, at its summit, against the cliff Cape Chudleigh

which forms the extremity of the island. The rocks of the islands and the south side of the strait appear to be all gneiss.

Port Burwell.

On the Ungava Bay side of Cape Chudleigh we entered an inlet about ten miles southward of the extremity of the land, and discovered a harbour on its north side, which we named Port Burwell, after Mr. H. W. Burwell, the gentleman who was left in charge of the station (No. 1) which we built here. The hills, for a few miles around Port Burwell, are only moderately high and are not generally steep. Their outlines are rounded and their rocky surfaces have scattered upon them numerous boulders as well as finer rocky *débris*. The rock everywhere consists of ordinary varieties of gneiss, the commonest of which are massive reddish and dark hornblendic and micaceous. The strike at the Port varies from N. 20° E. to N. 40° E. (mag.) The glacial striæ at the observatory station run S. 35° E. (mag.), but among the hills in the neighbourhood they were observed to follow the trends of the valleys with a general south-eastward course by the compass. A short distance south of the station, a vein, varying from 8 to 13 inches in width, occurs in the gneiss. Its direction corresponds nearly with the strike, which is here N. 20° E., running with the stratification for a short distance, breaking across to other beds, following them for a short distance and then jogging off to others. It consists of light grey dolomite and white quartz, holding a little iron pyrites and some crystals of quartz, rendered ruby-coloured by a layer of oxide of iron under the faces.

Mineral vein.

From Port Burwell I explored the inlet to the south-eastward, and found it to be a strait dividing into two branches at five miles from the Port, the northern of which was ascertained to run through to the Atlantic. The Eskimo whom we met in this strait informed us (through our interpreter) that the southern branch also continued through to the ocean. They also told us that there was no other channel to the south of this between Ungava Bay and the sea to the east. We named this newly found channel McLelan's Strait, in honour of the Minister of Marine and Fisheries, and the north-west point of the mainland, Cape William Smith, in honour of the Deputy Minister. At six miles from Port Burwell, the northern part of McLelan's Strait has contracted to half a mile in width, and has become flanked by high and steep hills, rising from either side. The tides, which at springs have here a rise and fall of upwards of twenty feet, run with great velocity through this narrow part. The locality is called Nunaingok by the Eskimo, which means the "hidden place," and the same name is applied to one or two other localities on the Labrador coast. In proceeding from Port Burwell to Nunaingok, our course was S. 5° E. (mag.) or S. 55° E. (true), and the country on

McLelan Strait.

either side of McLelan's Strait showed less and less evidence of glaciation. Even close to the shore, in approaching the higher hills which begin at Nunaingok, the gneiss is deeply decayed, the softening process having extended, particularly along the joints which run both vertically and horizontally, leaving only hard kernels with a more or less rounded outline, between them. Nunaingok is situated on an alluvial flat, extending between the two branches of the strait. The hill which rises steeply on the south side of it is about 700 feet high; but further in, between the branches and on either side of them, the mountains are from 1,500 to 2,500 feet high, and have rugged tops and sides. Rounded boulders were found scattered all over the side and top of the hill just referred to; but although it had probably been somewhat glaciated, it had not been planed down to hard surfaces, but had an irregular outline, and the rocks were much disintegrated. Among the transported boulders and pebbles scattered over its surface, some of brecciated drab limestone with clear quartz grains, pinkish red sandstone, red jasper and magnetic iron, were noticed. Fragments of grey, drab and yellowish limestone, with obscure fossils, were common around the base of the hill. The glacial striæ were well seen on the southern side of the hill referred to, where, in one case, they were observed to groove longitudinally a vertical wall, and even the under side of an overhanging shelf of rock. The general direction was S. 25° E., or with the course of the south branch of the strait.

Fossiliferous Limestone fragments

The fixed rocks around Nunaingok, as far as I had the opportunity to examine them, were all gneiss, the average strike of which was N. W. (true.) On one of the mountains on the north side of the northern channel a wide belt of brown, iron-stained rock runs diagonally through the ridge, the colour being probably due to the decomposition of iron pyrites, but I had not time to visit the place.

Eskimo village

At Nunaingok, on top of a bank of sandy earth, are the remains of an old Eskimo village. The roofs of most of the underground houses had fallen in, leaving only large circular pits. Some of these had become partially filled up, showing great antiquity. A few of the newest of them had been inhabited within a year. Some Eskimo camped in the vicinity informed us, through our interpreter, that this had once been a comparatively populous village, and a resort of their people as far back as their traditions extend. It is their custom to live in the underground houses from the commencement of winter, some time in November, till January, after which they leave them and spend the rest of the winter in igloes or snow houses. The water in the north branch of McLelan's Strait, they informed us, is open all winter at this point, and is much frequented by seals, which afford them a reliable supply of food. These animals they kill either from their kyaks or by

spearing them from hiding places which they have built of stones on every ledge and point of rock past which the seals are accustomed to swim. Great numbers of bones of seals, walruses, reindeer, foxes, hares, birds, &c., lie scattered about on the surface and mixed with the earth around the old dwellings. The remains of stone pots and implements near others of European manufacture showed a transition from the barbarous to a civilized condition. I was told by one of the Labrador missionaries, who had had a long experience of these people, that the comforts and conveniences of civilization rendered the Eskimo less vigorous and healthy, and, as a consequence, their numbers are diminishing.

The "Neptune" was anchored in 15 fathoms at low tide in Port Burwell. The bottom was a sandy mud, and was found, by dredging, to abound with shellfish, echinoderms and crustaceans. During our stay, from the 5th to the 8th of August, the water teemed with fine cod, which were taken in great numbers by jigging. Many of them were tolerably large, and they were of excellent quality, contrasting, in this respect, with the cod we had got at Nachvak, Ford's Harbour, and a fishing station on some islets we had passed to the south-east of it. Most of our crew had had more or less experience of the Labrador fisheries in previous years, and the superior quality of the Port Burwell cod was a subject of general remark among them. On our return to Port Burwell we found the fish still abundant on the 27th and 28th of September, and the party in charge of the station informed us that they could catch them any time they chose in the interval. At Nachvak the fishermen began to take cod on the 17th of July, and they were catching them in great numbers at the end of the month. During our stay in Skynner's Cove, in the inlet, from the 30th of September till the 6th of October, we caught as many as desired, by jigging from the ship's deck. From all that I could learn by enquiries along the Labrador coast and from our crew, it would appear that although the dates vary in different years and at different places, the average time for the cod to strike the shores is the middle of July, and that the particular time at any locality depends more on the presence or absence of ice than on its latitude. If this condition happened to be the same all along, the fish would appear at the same time at every part of the coast. This would be the natural inference, since there appears to be no other difference in the conditions which would affect the cod along the whole coast. Bait is used as far north as Cape Harrison, but beyond that the fish are so numerous and voracious that the naked jigger alone is required. The fish are dried on flakes as far as Indian Harbor, but on the more northern parts of the coast they are spread upon the shingle or the smooth, rounded rocks.

Fisheries.

Dates at which codfish arrive on the coast.

Station No. 2 was intended to be placed on Resolution Island, or one of the Lower Savage Islands to the north-westward of it; but after spending part of two days in endeavouring to find an anchorage or a harbour on these islands, the attempt was abandoned until we should be returning after establishing the remaining stations. A near view of Resolution Island was not obtained on this occasion, but the southern shores of the Lower Savages were seen closely enough to determine the rocks to be massive gneiss, of which the prevailing color was red. The iron bound shores of these islands rose abruptly several hundred feet above the sea.

On leaving the Lower Savages we proceeded by the strait to the vicinity of North Bluff, but a long distance from shore, until we came directly opposite to it. We anchored in a bay two miles east of the bluff, which we called Ashe's Inlet, after Mr. W. A. Ashe, D.T.S., who was to have charge of the observatory station (No. 3) which we proceeded to erect on the southern side of the bay.

Rocks of Ashe's Inlet.

The rocks on the west side of Ashe's Inlet consist of dark grey gneiss, composed principally of quartz and felspar in even beds. The general strike, which is pretty uniform, is east and west (true), and the dip, north at an angle of 40°. On the higher levels the surface of the rock is decayed into half isolated boulder-like masses. In the vicinity of the station, on the east side, a common variety of gray micaceous gneiss is met with, striking with regularity to the N.W. (true). A mile to the northward, however, on this side of the inlet, it has become east and west (true), corresponding with the strike on the west side. The country was examined for several miles inland, or what I judge to be about the centre of the (Big) island, and found to consist entirely of common varieties of gneiss, with a prevailing westerly strike. It contains many veins of "hungry" or barren milk quartz. Some of them contain felspar and black mica, giving them a somewhat granitic character. In one of them the felspar, which was white, was observed to be striated. The hills have a rounded sweeping outline, and their summits are a considerable distance apart. The wide even spaces between them hold shallow lakes, surrounded with green meadow-like flats and mossy slopes. Numerous rivulets and brooks run down the hills and discharge the waters of one lake into another. The general aspect of the landscape reminds one of some parts of the Highlands of Scotland. A shallow looking lake, with many stony points, begins about three miles northward of our anchorage, and has a length of three miles. It discharges south-westward into Ashe's Inlet by a wide, rapid and shallow stream, which we called Edith River. The Eskimo informed us that at certain seasons large trout were abundant in this lake and river.

Features of the country.

Around Ashe's Inlet the glacial striæ run about S. 65° E. (true). On the top of the hills the rocks are much weathered and only faint traces of the striæ remain. In these situations ridges of gneiss boulders, with an easterly direction, were occasionally met with. One of them, on a hill a short distance north of the observatory station, has evidently accumulated in the lee of a knob of rock which stands at its western extremity. Among the prevailing gneiss boulders, scattered on the hills and plains, were found several of grey dolomite like that of the Manitounuck group of rocks (Cambrian? See Geological Survey Report for 1877–78, p. 11 c.) and of the soft buff grey dolomite like that of the Churchill River. (See Geological Survey Report for 1878-79, p. 18, c.) I also found a large decomposed boulder which had been made up of coarse radiating crystals of greenish grey hornblende. A bed of the same rock was afterwards found interstratified with the gneiss at Cape Prince of Wales, on the south side of the strait, opposite to Ashe's Inlet. A small piece of greyish crystalline limestone was picked up near Ashe's Inlet, which bears a very close resemblance to a variety common in the Laurentian bands of the Ottawa valley.

Grey dolomite.

Some heavy field ice had drifted into Ashe's Inlet before our arrival there. The Eskimo informed us that this was the first time in their knowledge that such a thing had occurred, and this circumstance afforded us another proof of the unusual abundance of this kind of ice the present summer. Several of the pieces or "pans" were upwards of 20 feet thick, and as the tide has here a rise and fall of more than 30 feet, some of them were left dry at low water and were found to consist of solid blue ice. The outlines of these pans, as seen floating in the sea, more frequently approach a quadrilateral form than any other. This kind of ice was afterwards seen in great quantities around Salisbury and Nottingham Islands in the mouth of Fox's Channel, down which, there appears to be no doubt, all the heavy ice of Hudson's Strait, comes. On reaching the strait, it projects towards the south shore and breaks off in fields of greater or less extent which float up and down with the tide, always working to the eastward, and part of it finally escapes into Davis' Strait. Hudson's Strait, however, being about 500 miles long, the tendency of the wind and tide is to drive much of it ashore, or to imprison it in bays and inlets. Once it has reached such situations, the lee afforded by the high lands often prevents it from being drifted out to deep water again. In this way, during the present season a large quantity of it became fixed in Ungava Bay and detained the Hudson's Bay Company's steamer "Labrador" for twenty-one days, being the first time, I understand, that any detention of the kind has taken place. Mr. L. M. Turner, of the Smithsonian Institution, who was at Fort Chimo at the time, informed us that the thickness of some of these

Ice in Ashe's Inlet.

Source of pan-ice and its movements

blocks of ice was measured, and in one case found to be as much as 42 feet. Mr. Burwell, at station No. 1, on the west side of Cape Chudleigh, reported that, during August and September, he observed these heavy pans floating south-westward into Ungava Bay, but never returning past his station. At Ashe's Inlet the observer reported that the ice always floated back or westward, a short distance, with each tide, but finally disappeared to the eastward. Some of the heavy ice was stranded about Cape Prince of Wales in the latter part of August and the first half of September, but it had all gone when we re-visited the station here on the 23rd September. At Nottingham Island we observed some of the heaviest "pans" stranded in six fathoms of water, and they would, consequently, be about 40 feet thick.

I tested the ice of the stranded pans in some places, and always found it fresh. This would be the case, notwithstanding that the ice formed in sea water, for most of the salt would be thrown out in the freezing, and what might remain would drain away near the surface on exposure to the mild air of summer. Owing to the somewhat poor heat-conducting power of ice, it is not possible that so great a thickness as 40 feet could form in one winter in Fox's Channel. It is probable that a good many years would be required. In regard to the quantity of ice which has been observed in Hudson's Strait, a study of the experience of the vessels which have navigated these waters, as well as that of the ships of the Moravian Brethren coming to the coast of Labrador, would seem to show that there is a succession of good and bad years, with a minimum, and maximum at perhaps seven or eight years apart, or in cycles of some fourteen or fifteen years; also that there may be a maximum intensity in these cycles themselves, so that perhaps every third one will be more favourable in the minimum of ice and more severe in the maximum than the two intervening ones.

Periodicity of the seasons.

The fact that most of the ice-pans of Hudson's Strait, when not covered with fresh snow, are colored with dust and earth, points to their formation near shore, and also to their remaining there during one summer at least, when the ground is bare of snow and the surface not frozen. The dust appeared to be in too great a quantity to be of cosmic origin. These pans sometimes carry gravel on their backs, a circumstance which was noted in the Geological Survey Report for 1879–80, p. 20 c. When at Ashe's Inlet, a fact was observed which may explain the last mentioned phenomenon. Some tolerably thick ice still remained attached to the shore at high tide mark. During the melting of the snow on the hills above it, torrents had carried a quantity of stones and earth out of an adjacent bank and deposited them upon the surface of the ice. The connection between this ice and the shore being sufficiently weakened, the next spring-tide would carry it out to

Dust, earth and gravel on ice-pans.

sea, as previous tides had already carried parts of the adjoining ice, similarly laden.

Icebergs of Hudson's Strait

The icebergs of Hudson's Strait are of comparatively small size and are or have been mostly flat-topped. The original appearance of some of them has been altered by foundering and canting, which have occasionally been repeated several times, the various positions which the berg has occupied being indicated by water-lines now standing at different angles to the surface. These small icebergs are most numerous along the northern side of the strait, and they have never been observed west of Fox's Channel, out of which they proceed. They are supposed to originate from glaciers on the shores of this channel, but it is possible that they may come through the passages which are believed to run into it from Baffin's Bay and Lancaster Sound, or through Fury and Hecla Straits, in all of which the current is known to set southward.

Frozen soil.

The soil or drift material of Hudson's Strait is probably permanently frozen at a certain depth below the surface, although our interpreter told me it was not so at Nachvak, nor does it appear to be the case at Nunaingok, in McLelan's Strait. On Nottingham and Digges Islands, when the gneiss has been glaciated and its hard surface exposed to the cold, it appears to have become so deeply chilled that its temperature does not rise above the freezing point in summer, except in the direct sunshine. Whenever water in small quantities had flowed over these rocks at night or in the shade during the day it had become frozen.

Mica, graphite and iron pyrites

While the "Neptune" was lying at Ashe's Inlet a party of Eskimo from the eastward came on board. They brought with them plates of good, light coloured mica and pieces of pure foliated graphite, also a small piece of iron pyrites, and one of amorphous graphite. In reply to questions, they stated that they came from a place called Kimmirook, about two days' journey by kyak, to the eastward, and that they had gathered these specimens in that vicinity. They further stated that there was plenty, both of the mica and the foliated graphite. Having assembled these visitors, and also the Eskimo of North Bay, who were already at the Inlet, a party of thirty-eight in all, I exhibited to them my collection of minerals, and passing them round, one at a time, enquired successively if any of them had ever seen a mineral like that. In return for any information which they might give, I offered them tobacco, ammunition, kettles, &c., all of which they coveted very much and might easily have invented stories as to the occurrence of minerals in these regions in order to gain the articles offered. But the only kinds they recognized, besides those of which they had brought the specimens above mentioned, were a bright

red hæmatite occurring inland from Kimnirook, and a rather hard and inferior variety of soapstone, which they used for making pots before they obtained metal ones from the white men. At the western end of Big Island—in which this inlet and North Bluff are situated—they said they had observed plenty of hard white stones, like the quartz exhibited, in various localities, but no soft white ones such as the marble, gypsum, barytes, &c., the hardness of which they tested with their knives. Soapstone.

During our stay at Ashe's Inlet, the Eskimo killed two reindeer in the vicinity, and, judging from the numerous tracks of these animals they would appear to be common; but the natives informed us that they were much more abundant on the mainland to the north, where they are in the habit of hunting them most of the summer, coming again to the sea shore to live on seals and walruses during the winter. Three young harp seals were killed in the inlet during our visit, and as we steamed out of it we saw two walruses. One of our party obtained the tusk of a narwhal from the Eskimo who visited this inlet. Arctic hares were numerous on a small island, to which the foxes could not gain access. Gulls, gannets, guillemots, eider ducks and ptarmigan were the commonest birds. The young of the last named were about three parts grown on the 15th of August, and could fly with the adult birds. The Eskimo informed us that large trout were abundant, at certain seasons, in what we named Edith Lake and River, a few miles north of the observatory station. Reindeer. Arctic hares. Birds.

Driftwood, all spruce, of which a considerable quantity had been seen at Port Burwell and in McLelan Strait, was entirely absent at Ashe's Inlet, and Nottingham Island, and was scarce at Digges Island and Cape Prince of Wales.

We left Ashe's Inlet on the evening of the 16th August, and arrived at Cape Prince of Wales, on the opposite side of the strait, on the morning of the 17th, the distance being about 60 geographical miles, and the course about S. by W. (true). Prince of Wales Sound lies to the south-eastward of the cape, and appeared to be about 15 miles broad. We selected a place on the inner side of the cape for building the observatory station, and named it Stupart's Bay, after Mr. R. F. Stupart of Toronto, who was to have charge of it. The highest hill on the west side of the bay was ascertained to have a height, according to the barometer, of 340 feet, and the highest to the south of it to have a height of 180 feet. The rocks in the vicinity of the bay were found to consist entirely of Laurentian gneiss. In the hills on the west side of Stupart's Bay, the strike is from S. to S. 40° E (mag.), or nearly east and west (true). The gneiss in the hills, both to the south and west, is cut by numerous veins and bunches of milk-white quartz, Cape Prince of Wales. Quartz veins.

which in various parts are so conspicuous on the bare surface as to be seen from considerable distances. In one place on the eastward slope of the hill to the west a group of parallel veins of this mineral, varying from a foot to two feet in width, is traceable for some distance. Their course is slightly sinuous, but the average run is N. 55° W. (mag.). Red felspar occurs in some of these, and occasionally a little black mica. The top of this hill is rounded and striated. The glacial grooves are quite distinct. On the highest point their direction is S. 60° E. (mag.). A little below the summit, on the south side, they run S. 50° E., while at the observatory station, near the sea shore, their course is S. 40° E. (mag.).

Viewed from the top of the hill just referred to, the slopes and valleys to the north-eastward are full of ponds resting in basins of solid rock. Boulders are perched on the summits and slopes of all the hills around. Beaches of shingle, as fresh looking as those on the present sea shore, except that the stones are covered with lichens, may be seen at all levels, up to the tops of the highest hills in this vicinity. The long sloping hillside to the south of the observatory station, is covered with fields of shingle and small, round boulders, all blackened by the lichens. At the northern base of the ridge, to the north-west of the station, is a large, dry basin-like depression, with a notch on the outer side, through which it has formerly communicated with the sea. From the notch the shingle and mud are spread over the floor of the basin in a fanlike fashion, as if the tides had rushed violently in through this opening. The materials of the raised beaches above referred to consist principally of gneiss with milk quartz from the veins of the neighbourhood, together with a few fragments of yellowish grey dolomite, with obscure fossils, a hard and nearly black variety of silicious clay-slate, with an occasional boulder of dark, hard crystalline diorite.

Materials of the raised beaches.

Prince of Wales Sound has a breadth of, apparently, about fifteen miles, in a due S. E. bearing from Stupart's station, on the inner side of Cape Prince of Wales, and of probably eight or ten miles in a southerly direction. A long arm, the north shore of which I reached at two and a half miles due S. W. from the station, runs due west from the western side of the sound. This appeared to be the favourite resort of the Eskimo, and I propose to name it, for convenience, Eskimo Inlet. A small rapid river was crossed between the station and the inlet. The Eskimo informed me that another river enters the head of this inlet, and that it passes through two good sized lakes not far from the sea. Some large trout, which they had brought to the ship, were stated to have been caught in this river. Salmon were said to be found in another river entering the sound at a point about south of Stupart's Bay.

Trout and salmon.

The hills of gneiss between Stupart's Station and Eskimo Inlet are pretty thoroughly glaciated. The ridges and hummocks, as a rule, present smooth gradual slopes to the west and abrupt craggy faces to the east, showing that the movement of the ancient ice was from the west. The striæ are well seen in many places on the hills, the average direction being S. 40° E., (mag.) or about due east, astronomically. On the shore of the inlet they run a little north of true east or parallel with the course of the inlet itself. Here I found a good many boulders of grey and yellowish limestone on the beach. Limestone boulders.

The gneiss along the northern shore of Eskimo Inlet is of the ordinary variety, and has an average strike of N. 20° W. (mag.) One of the veins of white quartz in this locality contains purplish red calcspar, in rather coarse crystals of a uniform size, both the color and texture closely resembling some varieties of the banded crystalline limestones of the Laurentian series in the county of Lanark. Dark crystals of epidote occur along with it. Light green amorphous epidote and a bright red felspar are associated in some of the quartz veins of the vicinity. One of the Eskimo had a small lamp made of a soft, grey variety of schistose mica rock, which he said occurred on an island in Prince of Wales Sound. Mica rock.

From a hill near Eskimo Inlet a view was obtained far inland to the west. The surface of the country in that direction appears in long sweeping outlines, terminating in mountain ranges in some of the higher parts, and resembles the landscapes in various parts of Newfoundland.

The Eskimo report reindeer to be plentiful around Prince of Wales Sound at certain seasons, being most abundant, I understood, in the winter. During the interval between our two visits to the sound, the natives killed several, and a member of the observatory party shot one in the vicinity of Stupart's Bay. These people also told us that the polar bear was common on the southern shore of the strait, to the west, and that Ane-ugi, or Snow Island, about eight miles above Cape Prince of Wales, was a favourite place for them to land. The walrus is found at this cape at most seasons of the year. We saw several in going out and in with the "Neptune," and our interpreter killed one while we were lying in Stupart's Bay. Reindeer. Polar bear and walrus.

The Greenland, or harp seal, (*Phoca grænlandica*, Fabricius) was the species on which the Eskimo were living during our visit to Prince of Wales' Sound, but they had in their possession the skins of a good many harbour and square flipper seals, (*Phoca vitulina*, Linné) and (*Erignathus barbatus*, Fabricius). Some of the last-mentioned were very large, stretching from the apex of a wigwam to the ground, and measuring 11 or 12 feet in length.

In reply to questions put to the Eskimo here, through our interpreter, they informed us that not only the strait itself, but even Prince of Wales' Sound, did not freeze over in the winter, but that the ice drifted up and down with the tides. They stated that ice formed in the coves and around the shoals and islands off the cape. The chief reason why they live in this vicinity is that Cape Prince of Wales being "a good place for ice" they are more certain of a steady supply of seals and walruses than elsewhere.

As to the supposed passage or channel between Bay of Hope's Advance and Mosquito Bay, they did not appear to have any positive knowledge. Our interpreter did not think it existed, but as he came from the eastern Labrador, he had no definite idea on the subject. Being an egotistical individual, and wishing his own opinion to prevail, it was impossible for me to get a fair expression of the views of these people on this important matter.

Nottingham Island.

We left Stupart's Bay at Cape Prince of Wales, on the evening of the 22nd of August, and arrived at the southern part of Nottingham Island on the morning of the 24th. In passing the south side of Salisbury Island, the hills of the western part were observed to have more even outlines than those of the eastern, as if the glacial force had come from the westward. We anchored in five fathoms of water, in an inlet a few miles east of the most southern part of Nottingham Island, and found a suitable place for the station close to our anchorage, and on the north side of the inlet, which we named Port DeBoucherville, after Mr. C. DeBoucherville, of Ottawa, who was to have charge of this observatory.

Around Port DeBoucherville, and for some distance to the westward, the country consists of island-like hummocks of rock, more or less separated from one another and surrounded by clayey mud. The lower parts of these muddy intervals are partly overflowed by the tide, rendering the water turbid in all the bays and inlets of this part of the island. The clay is mingled with boulders and gravel, and it extends below the bottom of the sea on the one hand, and up the valleys to a height of 50 to 100 feet. In preparing to leave the port, it was found difficult to start our anchor out of the mud, some of which came up on one of the flukes, and proved to be an exceedingly tough bluish-grey clay, containing grains of coarse sand disseminated through it.

Clay bottom.

Red syenite and gneiss of Nottingham Island.

I explored the country to a distance of about three miles in various directions from our anchorage, and found the rocks to consist of common varieties of gneiss, the only exceptions noticed being patches of a fine-grained red syenite on both sides of the inlet. The average direction of the strike is south-west (true) but there are numerous local variations which, however, seldom carry its course outside of the

south-west quarter of the circle. The joints in the gneiss run about east, or nearly parallel with the glacial striæ, and this is also the direction of a number of long cuts and straight valleys or gorges in the gneiss, which have, therefore, an oblique angle to the strike. The bottoms of these depressions are filled with boulder-clay, which, on the surface, has a structural arrangement parallel with the walls, apparently due to a process of expansion and contraction and of heaving, on account of the intense frost of this region. In narrow cuts or gorges the heaving of the clay was the greatest along the sides, which had the effect of sorting out and throwing the boulders to the centre, where they formed rows as regular as if they had been placed artificially. Arrangement of boulders.

The direction of the joints in these rocks may also be that of dykes and veins, which, owing to decay and subsequent glacial action, would now be concealed in the bottoms of the depressions above referred to. At a projecting point on the one side of them, however, and running parallel to its walls, I found some straggling veins of hard grey dolomite, weathering brown and holding scales of mica. Veins of dolomite.

The rocks of the lower levels are well glaciated, and from upwards of twenty trials in various situations around Port DeBoucherville, the average course of the striæ across the south end of Nottingham Island was ascertained to be S. 30° E. (mag.), or only a few degrees southward of true east. That the direction of the glacial movement was towards the east is obvious from the contour of the *roches moutonnés*, the mode of the fluting of perpendicular walls and of channels cut in the rocks, as well as by the direction of the curves of the semi-circular lines across the larger grooves themselves. A valley, with a south-eastward bearing, enters the head of Port DeBoucherville, and along it the grooves partake of the same direction, showing that while the low southern portion of the island was swept by a great glacier from the west, others were traversing it from the north-west. Nearly half of the boulders, stones and gravel of the drift are grey limestone, like that of the Manitounuck (Cambrian) group, indicating the proximity of these rocks to the westward. The grey quartzite of this series is also well represented. One piece of this rock contained the characteristic spherical spots of a softer nature and lighter colour, which usually weather out into hollows on exposure. There are also fragments of black slate and red jasper, both of which have been found in the Manitounuck group. Two pieces of fine-grained white quartzite were noticed, which may have come either from rocks belonging to this group or to the Huronian series. A fragment of red sandstone conglomerate was also observed, of the same kind as that which underlies unconformably the Manitounuck rocks, and is so largely developed at Little Whale River and Richmond Gulf. (See Report of the Geo- Abundance of limestone fragments

logical Survey for 1877-78, pp. 12 and 14 c.) No shells were found in the boulder-clay, but a few common species were abundant in a bank of stratified sand, having a height of about eight feet above high-water mark at the head of a bay.

Reindeer, hares, foxes and birds on Nottingham Island.

During the interval between our two visits to Nottingham Island, the observatory party saw a few reindeer, but the numerous tracks and droppings of these animals show that they exist in considerable numbers. Several of their shed antlers were found, and all of them had the upper tines curiously hooked and curved inwards—a peculiarity which would be incompatible with forest life. We saw a few walruses when first approaching the island, and while the station was building, but they were quite numerous upon the ice which we passed through to the south of it on our return on the 20th of September. These animals accompany the ice during the summer, and its unusual prevalence in this quarter the present season was shown by the blighted condition of even the Arctic vegetation of the island. Arctic hares and foxes were seen, and both appeared to be abundant.

Among the more noticeable birds which breed on Nottingham Island, are the Arctic loon (*Columbus arcticus*, Linn.), and the whistling swan (*Cygnus americanus*, Sharpless). We killed four old swans, all moulting, and two young ones, nearly full grown, on the 27th of August, and the male, female and young of the arctic loon.

Ancient Eskimo camp.

At Port DeBoucherville I found distinct remains of a very ancient Eskimo camp in the form of heaps and circles of stones, like those of the modern Eskimo, on a raised beach at the head of what had been a cove. From what I have seen of the situations, which the Eskimo, in various places in Hudson's Bay and Strait, choose for their camps, there appeared to be little doubt that they had lived here when the sea-level was twenty to thirty feet higher than it is at present. On the rocks facing the open strait, just south of the inlet, the more recent works of these people are well preserved, although they are probably upwards of 100 years old. Besides numerous rings of tent-stones and some shapeless heaps, there are here several rectangular walls a few feet high, and caches of a bee-hive form, each about six feet in height and seven feet in diameter. Two of the latter are nearly complete, and are adapted either for storing meat or as hiding places or "stands" from which to kill game. A good photograph of one of them was obtained.

When we left Nottingham Island, it was proposed to place the next station on the south point of Mansfield Island, but the locality having been found unsuitable, the station was built on Digges Island, off Cape Wolstenholme, on our return voyage. As the geographical position of this station comes next in order, I shall now state the observations

Digges Island and Cape

which were made during our visit to the locality. Heretofore the name Digges or Cape Digges has been applied on the sketch charts to several islands, represented as lying off Cape Wolstenholme. Our explorations went, however, to show that there is only one island from ten to fifteen miles in length. The bare hills of which it is composed are divided into several detached groups by straight, transverse valleys, cutting well down towards the sea-level, thus giving the appearance of separate islands, when viewed from a distance. The greatest length of the island lies about east and west (true). As this is also the commonest direction of the strike of the gneiss, most of which is red, and also of the glacial striæ, the island has become divided by longitudinal valleys, some of which, too, were traced in nearly straight courses for several miles.

We found a good harbour on the south side of the island, about a mile from its western extremity well sheltered from all quarters except the south-west, with good holding ground and a convenient depth of water. The station was built on its south-east side, and placed in charge of Mr. A. N. Laperrière of Ottawa, after whom the harbour was called Port Laperrière. Only a narrow neck of land separates the head of the harbour from Hudson's Strait to the north. Between this and the western extremity of the island the hills have a rounded outline, and raised beaches, composed mostly of coarse shingle, form a prominent feature on their slopes, all the way from high tide mark to their summits, the highest of which is between 300 and 400 feet. Raised beaches

On the north side of Port Laperrière a light-colored quartzose band of gneiss contains numerous claret-colored garnets. Here the strike is N. 35° W. (mag.), but to the eastward of the harbour it is N. 45° W. (mag.), the bedding running in straight lines over a considerable area. At four miles east of the harbour, and towards the north side of the island, the gneiss strikes N. 50° W. (mag.). A well marked valley, with a chain of lakes along its bottom, comes to the south side of the island, about two miles east of Port Laperrière. It runs about east by north (true), and was explored for five or six miles without coming to the end of it. The general strike of the gneiss was parallel with the valley all along. Garnets.

The red gneiss, which rises from the shore on the north side of the valley, running eastward from the head of the harbour, is cut by two parallel fissures, only three or four feet apart, with well defined, slickensided walls, the intervening mass simulating a vein; but it is composed of red gneiss, all divided into small, sharp, angular pieces by a multitude of joints intersecting each other in all directions, and often lined with green epidote, which in this region very frequently accompanies veins and dislocations. These fissures run in a north-easterly direction. Red gneiss.

but curve about a good deal. They are accompanied by a small quantity of a handsome variety of red pegmatite, the quartz of which is blue, and the mass is occasionally streaked with bright green epidote.

Around the western part of Digges Island the course of the glacial striæ is from S. 70° E. to S. 75° E. (mag.); but in the interior it averages S. 55° E. (mag.), or with the general direction of the valleys.

We saw no Eskimo about Digges Island, but they appear to have visited Port Laperrière in recent years, as the remains of their camps were found in two or three places close to high tide mark. Some ancient camping places were also observed around this harbour, which, from their elevation above the present beach, the decayed nature of the larger bones lying about and the manner in which the circles of stones were embedded in the moss and overgrown with lichens, were supposed to be from 100 to 300 years old. Still more ancient works of the Eskimo were discovered in the valley which comes down to the head of the harbour. These consist of a row of stones lying in the vegetable matter at the surface, touching each other and running at right angles to the brook, at a contracted part of the bottom of the valley, which would be suitable for the Eskimo method of trout-fishing if the sea were 75 or 80 feet higher than it is at present. If the sea has receded as rapidly as seven feet a century, these works would be upwards of 1,000 years old, and if the rate has been less they must be even more ancient.

Ancient Eskimo works.

The same day that we arrived at Port Laperrière (16th September) a she polar bear and her two cubs were killed in the interior of the island, about two miles from the ship. The cubs were somewhat larger than sheep, and were probably between seven and eight months old. Our party having approached them cautiously, one of them was observed sucking its mother. I examined the stomachs of all three, and found them to contain nothing but partially chewed grass. About four quarts of this were found in the stomach of the old bear and two and a half and one and a-half respectively in the cubs' stomachs. I had been informed by some Eskimo and Hudson's Bay Company's people that the polar bears sometimes eat grass, and I had occasionally seen along with their tracks, dung which could scarcely have been dropped by any other animal, and which was made up of the remains of comminuted grass and other vegetable matter. The three bears referred to were killed on a grassy spot where they had spent some time, apparently for the purpose of eating grass, and this was probably their only object in wandering away from the sea. The presence of the newly swallowed grass in such quantity in the stomachs of all three convinced me that these creatures live, to some extent, on vegetable food. On the 30th of August, while sailing down the east side of Mansfield Island,

Polar bears and walruses.

we saw a large polar bear and cub running along the rocks about a mile back from the shore. Walruses were numerous around Digges Island during our stay there. They were always in the water and were generally seen in groups of from three to seven or eight.

We arrived at the eastern part of Mansfield Island, about mid-way down, on the morning of the 30th of August. Its even outline presented a remarkable contrast to the shores of Hudson's Strait. It resembled a gigantic ridge of gravel; but stratified rocks, in low horizontal ledges, appeared here and there, through the *débris*, at different levels. At one place, four or five miles inland, the island rises to an elevation of about 300 feet above the sea, and this was the highest point observed upon it. Small streams appear to run out upon the eastern shore, and narrow cañons are cut in the rock in a few places. The monotony of the eastern slope of the island is broken at one locality by the rocks projecting through the *débris* in a form resembling an old castle, with three towers on the left, and a wall broken through by embrasures on the right. A short distance to the south of this there is a cliff, with a distinct pillar on the left. These points are considered worth noting, as they have a bearing on questions as to the glacial phenomena of these regions. For many miles, the whole of the eastern slope of the island presents a succession of steps or small terraces, mostly too low to be distinctly counted, but there might be a hundred of them between the sea level and the highest parts of the island visible. These appeared to be partly ancient beaches, and partly the outcropping edges of nearly horizontal strata. I landed at a point about the middle of the eastern shore of the island, and found the shore very flat, with shallow water for a considerable distance out. The rock proved to be a fossiliferous grey limestone, in rather thin horizontal beds. The fossils are very obscure and scarce at the place referred to. Those collected, Mr. Whiteaves thinks, may possibly be Cambro-Silurian. The rocks themselves resemble the limestones of the Red and Nelson Rivers. I landed again near the south end of the island, and found the water very shallow in approaching the shore. No rock was detected *in situ* at this place; but a great extent of gravel and coarser shingle, derived from limestone like that found *in situ* further north was thrown into a succession of long, low ridges and terraces, all curving with the contour of the land. Behind most of the ridges I met with long ponds of clear, fresh water. A number of caches and "stands," built by the Eskimo, were seen along the shore of Mansfield Island, but none of these people were observed.

Mansfield Island.

Fossiliferous limestone.

From the southern extremity of Mansfield Island we steamed to Cap. Southampton, and thence coasted north-eastward, in the hope of finding a suitable site for building an observatory station, but without success; and after making about twenty or thirty miles in that direc-

Southampton Island.

tion, we returned to the cape and passed round it to the westward, shaping our course thence for the opposite side of Hudson's Bay. The general character of this island, and the part of its shore which we examined, are quite like the eastern side of Mansfield Island. It has rather more vegetation upon it than the last named island, and much of the surface has a brown colour in consequence. Shallow water, having a light green colour, extends some distance out all along. The island slopes gradually up from the beach and is thrown into a great many small terraces. The highest point seen did not exceed 200 feet above the sea. I noted that the limestone is evidently exactly the same as that of Mansfield Island. Low cliffs in the upper levels break through the decayed mass and the *débris*, and horizontal ledges also make their appearance through the loose materials near the sea beach.

Horizontal strata of limestone.

We did not observe any natives on the part of the island which we saw, but at four miles north-east of Cape Southampton there were three fresh houses of the Eskimo, covered completely with sods and moss, and having the doors built round with stones. About three-quarters of a mile to the north-eastward of these were five old Eskimo houses, built of stones and sods, with some sticks and bones lying on their tops.

Coast between Chesterfield Inlet and Marble Island

Our first landing place on the western side of Hudson's Bay was Marble Island, but we had a distinct view of the land between it and Chesterfield Inlet. Judging from specimens which I have received through the kindness of Mr. George McTavish, of the Hudson's Bay Company, a portion of this coast is occupied by rocks, which may be referred to the Huronian series, among them being diorites, hornblende-schists and glossy mica-schists characterized by numerous cubes of iron pyrites. On the coast opposite to Marble Island, the last named rock appears to contain the veins of granular iron pyrites, an assay of a specimen from one of which, from Inari, was made by Mr. Hoffmann in 1879. (See p. 23 H., Report Geological Survey, 1878–79). These glossy mica-schists were found on Deadman's Island, near the west end of Marble Island. From all that I have been able to learn on the subject, a set of rocks, very like those of the township of Ascot, in the province of Quebec, and holding similar pyrites veins, which are of great economic value, will be found in this part of the western coast of Hudson's Bay.

Huronian schists.

Marble and Deadman's Islands

The harbour on Marble Island, which is resorted to by the American whalers, and in which we also anchored, is situated on the south side of the island, about two and a half miles from the western extremity. The outer harbour is formed by Deadman's Island, about a quarter of a mile long, lying across the front of a small bay. The inner harbour is a basin, which connects with this through a narrow gap in the rock with only about one fathom of water at low tide.

British American Bank Note Co Montreal

VIEW OF MARBLE ISLAND FROM DEADMAN'S ISLAND

SHOWING THE [illegible] OF THE WHITE QUARTZITE [illegible] NEPTUNE IN THE HARBOUR

Deadman's Island consists of white and light grey quartzites and glossy mica-schist, striking N. 75° W. (mag.). The glacial striæ on this island are well marked and run S. 10° E. (mag.). In the course of the day which we spent at Marble Island, I rowed round its western end and thence eastward along its northern shore for some miles. I also explored the interior and took some photographs between this side of the island and the harbour. The whole of the western part of the island consists of white and light coloured quartzite, bearing a strong resemblance to white and veined marble, from which circumstance it has no doubt received its name. Viewed from sea, the shores have a very white appearance, the rocks being free from lichens, &c., and the hills in the interior, which are rounded, are also pure white, and contrast strongly with the dark brown of the peaty flats and hollows. Even the boulders and coarse shingle forming the raised beaches remain quite white, and these beaches appear as conspicuous horizontal lines against the dark vegetable matter. The beds of quartzite are usually very massive. Their surfaces are often ripple-marked, the ridges and hollows varying much in size, being sometimes as fine and regular as the fluting on a washboard, and at others two or three inches apart. On the south side of the island, near the west point, the quartzite is of a beautiful lilac tint, some of the beds being more deeply coloured than others. The strike is here N. 80° W. (mag.), the dip being to the northward, at an angle of 80°. The surface of the rock at this place is marked by large green stains of carbonate of copper, some of them being 3 or 4 feet in diameter. They appear to be due to the decomposition of small quantities of copper pyrites in the quartzite.

Quartzites of Marble Island.

Carbonate of copper

At the north-west point of the island the dip is N. 75° W. (mag.), angle 45° and the striæ here run S. 20° E. (mag.). This is also the prevailing dip in the interior part of the island. On the north shore of the island, opposite to the harbour on the south side, the dip is N. 60° W. (mag.), angle 40°. Not only does the strike vary considerably on the large scale, but the lines of stratification were in places observed to undulate a good deal on a small scale, while the general course of the beds was pretty straight, the minor variations appearing as mere corrugations of the darker lines of stratification on smooth sections.

Although quartzite was the only rock found *in situ* on the main island, so far as I had time to explore it, the *debris* of the glossy mica-schist with cubes of iron pyrites, was so abundant along the north side that I have no doubt it exists "in place" close by. A fragment of the peculiar brown-weathering dolomite with white quartz strings of the Huronian series, was also found on this part of the island.

Mica schists with pyrites.

We left Marble Island in the evening of the same day that we

arrived there (2nd September), and entered the harbour of Churchill on the 6th. The geology of this locality is described in the Geological Survey Report for 1878–79, pages 19 c to 21 c. After leaving Churchill we paid a visit of twenty-four hours to York Factory, from which we sailed for Digges, where we built station No. 5, as already stated, and after visiting all the other stations and building the one at Nachvak, which has been described in a previous part of this report, we continued our homeward voyage to St. John's, Newfoundland, which we reached on the 11th of October, and left the same evening for Halifax, where we arrived on the 14th and at Ottawa on the 16th of the same month.

GENERAL REMARKS ON GLACIATION.

It will be seen by an inspection of the chart, that Fox's Channel, in respect to width, general direction, &c., is a continuation of Hudson's Strait, and that the outlet of Hudson's Bay joins this great channel at right angles. It is much deeper than Hudson's Bay, the comparative shallowness and the uniformity of the bottom of which are remarkable features. If the sea in these latitudes were only about 100 fathoms lower than it is at the present time, James' and Hudson's Bays would become dry land, while the strait would remain as a long bay, but with a slightly diminished breadth. The bottom of the bay would have become a plain, more level in proportion to its extent than any other on the continent. The numerous rivers which now flow into it would traverse this plain, converging towards the north-east and falling into the strait near Cape Wolstenholme, after having, perhaps, formed one immense river, flowing northward down the centre of the bay, or probably nearer the East-main side.

During the "great ice age" the basin of Hudson's Bay may have formed a sort of glacial reservoir, receiving streams of ice from the east, north and north-west and giving forth the accumulated result as broad glaciers, mainly towards the south and south-west. It has been shown, in a preceeding part of this report, that the direction of the glaciation, on both sides of Hudson's Strait, was eastward. That an extensive glacier passed down the strait may be inferred from the smoothed and striated character of the rocks of the lower levels, the outline of the glaciated surfaces pointing to an eastward movement, the composition of the drift, and also from the fact that the long depression of Fox's Channel and the strait runs from the north-westward towards the south-east, and that this great channel or submerged valley deepens as it goes, terminating in the Atlantic Ocean. Glaciers are said to exist on the shores of Fox's Channel and they may send

down the flat-topped icebergs which float eastward through the lower part of Hudson's Strait into the Atlantic. During the drift period, the glacier of the bed of Hudson's Strait was probably joined by a contribution from the ice which appears to have occupied the site of Hudson's Bay, and by another also from the southward coming down the valley of the Koksok River, and its continuation in the bottom of Ungava Bay. The united glacier still moved eastward round Cape Chudleigh into the Atlantic.

Throughout the drift period, the top of the coast range of the Labrador, stood above the ice and was not glaciated, especially the high northern part. Further south on this coast, the range is lower and there may also have been more ice in this direction. Here the valleys and the hills, up to the height of 1,600 feet, at any rate, have been planed by glacial action, the course followed by the ice on the eastern slope having been down the valleys and fjords directly into the sea. In the southern part of the Labrador peninsula, the general course of the ancient glaciation appears to have been southward, varying to the eastward or westward with the courses of the rivers and valleys, and coming to the north shore of the Gulf of St. Lawrence, in a general way, at right angles to the coast line. On the Island of Newfoundland, the glaciation appears to have been from the centre towards the sea on all sides.

APPENDIX 1.

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LIST

BY PROFESSOR MACOUN

OF

PLANTS COLLECTED ON THE COASTS OF LABRADOR, HUDSON'S STRAIT AND BAY.

BY

DR. ROBERT BELL IN 1884.

This collection is a very interesting one, and shows conclusively the arctic character of the climate of the straits and that part of Labrador north of Nachvak. North of Nain all the plants obtained are exclusively arctic, scarcely one of them extending south to the Gulf of St. Lawrence, and then only close to the sea or in cold peat bogs or on high mountains.

From the collection just examined, I consider the water of the straits to be constantly at a very low temperature and the atmosphere to be generally at the point of saturation. These two conditions give almost the same flora as would be found near the snow-line on a mountain. I believe the above conditions sufficient to produce the extremely arctic character of the flora of the straits.

In the accompanying List, the species collected at the various points are grouped as follows:—

Column I.—Shore of Hudson's Bay at York Factory and Fort Churchill.

II.—Mansfield, Digge's and Nottingham Islands, at the western end of the straits.

III.—Cape Prince of Wales and Ashe's Inlet, or North Bluff, in the middle of the straits.

IV.—Cape Chudleigh (Port Burwell) at the eastern end of straits.

V.—Nachvak, Ford's Harbour and Nain, coast of Labrador.

VI.—Plants collected at Hopedale and Nain, by the Revd. Dr. Samuel Weiz, Moravian Missionary.

VII.—Greenland Plants. List taken from Dr. Hooker's Catalogue of Arctic Plants.

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
	I. RANUNCULACEÆ.							
1	Anemone multifida, DC.	*					*	
2	" parvifiora, Michx. (A. borealis, Richards)				*			*
3	Thalictrum alpinum, Linn							
4	Ranunculus aquatilis, L. var. trichophyllus, Wat				*			*
5	" nivalis, Linn		*		*		*	*
6	" affinis, R. Br. var. leiocarpus, Wat. (A. auricomus, Linn.)		*		*		*	
7	" Flammula, L. var. reptans, Gray						*	*
8	" Lapponicus, Linn				*		*	*
9	" pygmæus, Wahl				*			*
10	" hyperboreus, Linn							
	II. PAPAVERACEÆ.							
11	Papaver nudicaule, Linn		*	*	*		*	*
	III. CRUCIFERÆ.							
12	Arabis alpina, Linn				*			*
13	Cardamine pratensis, Linn		*		*		*	*
14	" bellidifolia, Linn						*	
15	" hirsuta, Linn	*					*	*
16	Parrya arctica, R. Br		*	*	*		*	
17	Braya alpina, Sternb		*					*
18	Draba arabisans, Michx		*				*	
19	" stellata, Jacq. Var. nivalis, Regel (A. muricella, Wahl)		*	*	*		*	*
20	" stellata, Jacq			*	*			*
21	" alpina, Linn		*		*			*
22	" " var. glacialis, Dickie		*					
23	" " var. corymbosa, Durand		*					*
24	" rupestris, R. Br		*					
25	" androsacea, Wahl (C. crassifolia, Graham)		*	*			*	*
26	" incana var, confusa, Poir (C. contorta)	*					*	
27	" aurea, Vahl						*	*
28	Cochlearia officinalis, Linn		*	*	*		*	
	IV. VIOLACEÆ.							
29	Viola canina, var. sylvatica, Regel					*	*	*
30	" blanda, Ait.?						*	
	V. CARYOPHYLLACEÆ.							
31	Silene acaulis, Linn			*		*	*	*	*
32	Lychnis alpina, Linn		*	*	*	*	*	*	*
33	" apetala, Linn		*					*	*
34	" affinis, Vahl						*	*	*
35	Arenaria Groenlandica, Spreng.		*			*	*		*
36	" verna, var. hirta, Watson			*			*		*
37	" stricta, Fenzl								

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
38	Arenaria stricta peploides, Linn	*	*	*	*	*	*	*
39	" arctica, Linn						*	*
40	Stellaria humifusa, Rottb		*			*	*	*
41	" longipes, var. minor, Hook	*		*	*	*	*	*
42	" " var. læta, Torr. & Gr		*					
43	" " var. Edwardsii, Torr. & Gray		*				*	*
44	" borealis, Bigel	*					*	*
45	" crassifolia, Ehrh						*	
46	Cerastium trigynum, Vill				*		*	*
47	" alpinum, Linn							
48	" " var. Fischerianum, Torr. & Gray		*	*		*	*	*
49	" " var. glabratum, Hook.		*	*				*
	VI. Leguminosæ.							
50	Astragalus alpinus, Linn				*	*	*	
51	Oxytropus podocarpa, Gray		*					
52	" arctica, R. Br		*		*		*	
53	" campestris, var cœrulea, Koch.			*	*	*	*	
54	Hedysarum boreale, Nutt						*	
55	" Mackenzei, Rich	*						
	VII. Rosaceæ.							
56	Rubus Chamœmorus, Linn	*	*	*		*	*	*
57	" arcticus, var. grandiflorus, Ledeb					*	*	
58	" strigosus, Michx						*	
59	Dryas octopetala var. integrifolia, Cham. & Schl	*		*	*	*	*	*
60	Potentilla anserina, Linn	*				*	*	*
61	" tridentata, Solander					*	*	*
62	" Pennsylvanica, Linn	*						
63	" pulchella, R. Br		*					*
64	" Norvegica var. Labradorica, Macoun					*	*	
65	" nivea, Linn		*	*			*	*
66	" maculata, Pourret			*		*	*	*
67	" emarginata, Pursh		*	*				*
68	Sibbaldia procumbens, Linn			*		*		*
	VIII. Saxifragaceæ.							
69	Saxifraga oppositifolia, Linn		*	*		*		*
70	" Hirculus, Linn	*	*					*
71	" tricuspidata, Retz	*	*	*		*	*	*
72	" aizoides, Linn			*		*	*	*
73	" cæspitosa, Linn		*	*				*
74	" " var. uniflora, Hook.		*	*				*
75	" nivalis, Linn. var. ? Hook		*	*		*	*	*
76	" cernua, Linn		*	*		*	*	*
77	" rivularis, Linn		*	*	*		*	*
78	" stellaris, Linn						*	*
79	" Aizoon, Jacq						*	*
80	Ribes prostratum, L'Her						*	

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
	IX. CRASSULACEÆ.							
81	Sedum Rhodiola, DC.			*		*	*	*
	X. DROSERACEÆ.							
82	Drosera rotundifolia, Linn.						*	
	XI. HALORAGEÆ.							
83	Hippuris vulgaris, Linn	*			*		*	*
84	" maritima, Hellen		*				*	
	XII. ONAGRACEÆ.							
85	Epilobium angustifolium, Linn	*				*	*	*
86	" latifolium, Linn		*	*	*	*	*	*
87	" alpinum, Linn				*		*	*
88	" palustre, Linn						*	*
89	" organifolium, Linn.							
	XIII. UMBELLIFERÆ.							
90	Archangelica atropurpurea, Hoffm.					*		
91	" Gmelini, DC.					*		
	XIV. CORNACEÆ.							
92	Cornus Canadensis, Linn.					*	*	
93	" Suecica, Linn.					*		*
	XV. CAPRIFOLIACEÆ.							
94	Linnæa borealis, Linn	*				*		
95	Lonicera cærulea, Linn.						*	
96	Viburnum pauciflorum, Pylaie (V. acerifolium)	*					*	
	XVI. RUBIACEÆ.							
97	Galium trifidum, Linn (G. Claytoni, Mx.)	*					*	
	XVII. COMPOSITÆ.							
98	Aster Radula var. strictus, Gray (A. strictus, Mx)						*	
99	Solidago macrophylla, Pursh (S. thyrsoidea, Meyers)						*	*
100	" multiradiata, Ait (S. Virga-aurea var. multiradiata)	*					*	*
101	Erigeron unifiorus, Linn (E. humilis, Graham)			*	*	*	*	*
102	" Eriocephalus, J. Vahl				*	*		
103	Antennaria alpina, Gærtn. (Gnaphalium alpinum)				*	*		*
104	" dioica, Gærtn.	*			*	*		*

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
105	Achillæa Millefolium, Linn. Var nigrescens, E. Meyer					*	*	
106	Chrysanthemum arcticum, Linn	*						
107	" integrifolium, Richards.		*					
108	Matricaria inodora, L. var. nana, Torr. & Gray	*	*					
109	Artemisia borealis, Pall						*	*
110	Arnica alpina, Olin (A. plantaginea, Pursh.)	*		*	*		*	*
111	Senecio aureus, L. var. borealis, Torr. & Gray (S. pauciflorus)	*				*	*	
112	" Pseudo-Arnica, Less						*	
113	Taraxacum officinale, Web. var. lividum Koch (Leontodon Taraxacum)		*	*	*	*	*	*
114	Erigeron acris, Linn. var. Dœbachensis, Blytt (E. elongatus)						*	
115	Gnaphalium supinum, Vill. (G. pusillum, Hænke)						*	*
116	" Norvegicum, Gunner						*	*
117	Petasites palmata, Gray. (Tussilago palmata)						*	
	XVIII. Campanulaceæ.							
118	Campanula uniflora, Linn			*	*		*	*
119	" Scheuchezeri, Vill. var. heterodoxa, Gray				*	*	*	*
	XIX. Ericaceæ.							
120	Vaccinium uliginosum, Linn		*	*	*	*	*	*
121	" vitis-Idæa, Linn			*	*	*	*	*
122	" Pennsylvanicum, Lam. (V. tenellum, Pursh.)						*	
123	" oxycoccus, Linn	*					*	*
124	Arctostaphylos alpina, Spreng	*		*	*	*	*	*
125	Andromeda polifolia, Linn						*	*
126	Cassiope tetragona, Don		*	*				*
127	" hypnoides, Don (Andromeda hypnoides)				*		*	*
128	Bryanthus taxifolius, Gray (Andromeda cærulea)					*	*	
129	Kalmia glauca, Ait					*	*	
130	Rhododendron Lapponicum, Wahl						*	*
131	Ledum, palustre, Linn			*	*	*	*	*
132	" latifolium, Ait (L. Grœnlandicum)	*				*	*	*
133	Loiseleuria procumbens, Desv					*		*
134	Pyrola rotundifolia, L. var. pumila, Hook (P. grandiflora)		*	*	*	*	*	*
135	" minor, Linn		*				*	*
136	" secunda, Linn						*	*
137	Moneses uniflora, Gray. (Pyrola uniflora, Linn)	*					*	
	XX. Diapensaceæ.							
138	Diapensia Lapponica, Linn		*	*	*	*	*	*

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
	XXI. PLUMBAGINACEÆ.							
139	Armeria vulgaris, Willd. (Statice maritima)		*	*	*	*		*
	XXII. PRIMULACEÆ.							
140	Primula farinosa, Linn	*					*	
141	" Mistassinica, Michx						*	
142	Trientalis Americana, Pursh. (D. Europeus, Mx.)						*	
	XXIII. GENTIANACEÆ.							
143	Gentiana amarella, L. var. acuta, Hook	*					*	
144	Pleurogyne rotata, Griseb	*					*	*
145	Menyanthes trifoliata, Linn	*					*	*
	XXIV. BORAGINACEÆ.							
146	Mertensia maritima, Don (Pulmonaria maritima)			*		*	*	*
	XXV. SCROPHULARIACEÆ.							
147	Veronica alpina, Linn				*		*	*
148	Castilleia pallida, Kunth. var. septentrionalis, Gray	*				*	*	
149	Bartsia alpina, Linn						*	*
150	Pedicularis euphrasioides, Stephan (P. Labradorica, Houth)					*	*	*
151	" Grœnlandica, Retz	*				*	*	
152	" Lapponica, Linn			*			*	*
153	" Langsdorffii, Fisch			*				*
154	" " var. lanata, Gray				*			
155	" hirsuta, Linn					*		*
156	" flammea, Linn		*			*	*	*
157	Euphrasia officinalis, Linn	*				*	*	*
158	Rhinanthus Crista-galli, Linn	*					*	*
	XXVI. LENTIBULARIACEÆ.							
159	Pinguicula vulgaris, Linn	*					*	*
160	" villosa, Linn					*	*	*
	XXVII. PLANTAGINACEÆ.							
161	Plantago maritima, Linn	*	*			*		*
	XXVIII. POLYGONACEÆ.							
162	Oxyria digyna, Linn. (Rumex digynus)	*		*	*	*	*	*	*
163	Rumex occidentalis, Wat	*		*	*	*	*	*	*
164	Polygonum viviparum, Linn							*	*
165	" aviculare, Linn			*	*			*	*
166	Kœnigia Islandica, Linn								

No.		I.	II.	III.	IV.	V.	VI.	VII.
	XXIX. Empetraceæ.							
167	Empetrum nigrum, Linn	*	*			*	*	*
	XXX. Myricaceæ.							
168	Myrica Gale, Linn						*	
	XXXI. Betulaceæ.							
169	Betula glandulosa, Michx (B. nana, DC)					*	*	*
170	Alnus viridis, DC					*	*	*
	XXXII. Santalaceæ.							
171	Comandra livida, Richards						*	
	XXXIII. Salicaceæ.							
172	Salix reticulata, Linn	*	*		*	*	*	*
173	" Cutleri, Tuckerman				*	*	*	
174	" herbacea, Linn		*		*	*	*	*
175	" arctica, R. Br		*		*	*	*	*
176	" vestita, Pursh					*	*	
177	" argyrocarpa, Anders (S. repens)		*	*		*	*	
178	" planifolia, Pursh					*	*	
179	" myrsinites, Linn						*	*
180	" Lapponum, Linn. (?)					*	*	
181	" ——— No. 1				*			
	XXXIV. Coniferæ.							
182	Picea nigra, Linn					*		
183	Larix Americana, Michx					*		
	XXXV. Liliaceæ.							
184	Tofielda palustris, Hudson					*	*	*
185	Maianthemum Canadense, Desf						*	
186	Streptopus amplexifolius, DC						*	
	XXXVI. Orchidaceæ.							
187	Habenaria dilatata, Lindl. (Orchis dilatata)						*	
188	Listera cordata, R. Br (Ophrys cordata)						*	*
	XXXVII. Alismaceæ.							
189	Triglochin maritimum, Linn	*					*	
	XXXVIII. Iridaceæ.							
190	Iris tridentata, Pursh (I. caurina)						*	
	XXXIX. Juncaceæ.							
191	Luzula spadicea DC. var. parviflora, Wats.					*	*	*

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
192	Luzula arcuata, E. Meyer (L. campestris)		*	*		*	*	*
193	" spicata, Desv		*		*	*	*	*
194	Juncus triglumus, Linn						*	*
195	" castaneus, Smith						*	*
196	" trifidus, Linn							
	XL. Cyperaceæ.							
197	Scirpus cæspitosus, Linn	*	*		*	*	*	*
198	Eriophorum vaginatum, Linn		*				*	*
199	" polystachyon, L	*					*	
200	" gracile, Koch				*		*	
201	" russeolum, Fries		*					*
202	Carex nardina, Fries				*			*
203	" glareosa, Wahl		*		*			*
204	" fuliginosa, Stern. & Hoppe				*	*	*	*
205	" rigida, Good		*		*		*	
206	" saxatilis, Linn (C. cæspitosa)						*	*
207	" atrata, Linn						*	*
208	" rariflora, Smith						*	*
209	" Magellanica, Lam						*	
210	" festiva, Dew						*	*
211	" heleonastes, ? Ehrh						*	*
212	" dioica, Linn							
	XLI. Gramineæ.							
213	Hierochloa alpina, R. & A			*	*	*	*	*
214	Alopecurus alpinus, Smith		*	*		*	*	*
215	Deschampsia flexuosa, L. (Aira flexuosa)			*	*	*	*	*
216	Deyeuxia Lapponica, Kunth	*	*	*		*	*	*
217	Trisetum subspicatum var. molle, Gray		*	*		*		*
218	Phippsia algida, R. Br	*				*	*	*
219	Poa alpina, Linn		*			*	*	
220	" laxa, Haenke		*			*		*
221	" arctica, R. Br		*					
222	Glyceria angustata, R. Br		*					*
223	Dupontia Fischeri, R. Br			*				*
224	Colpodium latifolium, R. Br		*					
225	Dupontia psilezantha, Respet		*	*		*		*
226	Festuca brevifolia, R. Br		*	*		*	*	
227	Elymus mollis, Trin							
	XLII.							
228	Equisitum sylvaticum, Linn						*	*
229	" arvense, L. var. serotinum, E. Meyer	*		*		*	*	*
230	" scirpoides, Michx						*	*
231	" limosum, Linn. (E. uliginosum)							
	XLIII. Filices.							
232	Aspidium fragrans, Swartz				*	*	*	*
233	Cystopteris fragilis, Bernh			*	*		*	*
234	Woodsia hyperborea, R. Br							

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
235	Phegopteris polypodioides, Fee						*	*
236	Botrychium Lunaria, Swartz	*					*	*
	XLIV. Lycopodiaceæ.							
237	Lycopodium selago, Linn		*		*			*
238	" sabinæfolium, Willd					*		*
	XLV. Musci.							
239	Sphagnum acutifolium, Ehrh			*				
240	Dicranum scoparium, Hedw					*		
241	" fuscescens, Turn		*					
242	" Schraderi, Web. & Mohr		*					
243	" Starkii, Web. & Mohr		*					
244	Distichium capillaceum, Linn		*					*
245	Grimmia apocarpa, Linn		*					
246	" trichophylla, Grev		*					
247	Racomitrium sudeticum, Funk		*					
248	" fasciculare, Brid		*					
249	" lanuginosum, Brid		*	*				
250	Polytrichum juniperinum, Hedw		*			*	*	*
251	" strictum, Banks					*		
252	Pogonatum alpinum, L. var. brevifolium, Brid		*					
253	Mnium affine, Bland		*					
254	Bryum intermedium, Web. & Mohr		*					
255	" inclinatum, Swartz		*					*
256	" arcticum, Bruch. & Schimp		*	*				
257	" ———, ? (No fruit)		*					
258	" Brownii, Bruch. & Schimp		*	*				
259	Hypnum rivulare, Bruch						*	
260	" ———, ?						*	
261	" nitens, Schreb		*					
262	" stramineum, Dicks		*					*
263	" adnexum, Hedw		*					
264	" cordifolium, Hedw		*					
	XLVI. Hepaticæ.							
265	Scapania nemorosa, Linn		*					
266	Ptilidium ciliare, Ehrh		*					*
267	Jungermannia minuta, Crantz		*					*
268	" barbata, Schreb		*					*
	XLVII. Lichenes.							
269	Cetraria Islandica, Ach		*	*				*
270	" aculeata, Fries		*					*
271	" nivalis, Ach		*			*		*
272	" arctica, Hook		*	*	*			*
273	Alectoria ochroleuca, var. rigida		*		*	*		*
274	" ochroleuca, var. nigricans, Ach			*	*			*
275	Thelschistes parietinus, Norm		*	*				
276	Umbilicaria anthracina, Schær		*					
277	" hyperborea, Hoffm				*			
278	Solorina crocea, Ach				*			

Nos.		I.	II.	III.	IV.	V.	VI.	VII.
						*		*
279	Nephroma arcticum, Fries		*					*
280	Peltigera canina, Hoffm		*			*		*
281	Stereocaulon Despreaultii, Nyl			*				*
282	" denudatum, Floerk		*					*
283	Cladonia pyxidata, Fries		*					*
284	" gracilis, var. elongata, Fries					*		*
285	" rangiferina, Hoffm					*		*
286	" " var. sylvatica, Linn.				*			*
287	" decorticata, Floerk		*	*				
288	" Sphœporon globifera		*					*
289	Thamnolia vermicularis, Schær							
	XLVIII. Fungi.							
290	Lycoperdon			*				
291	Russula		*					
292	Agaricus			*				
293	Lophodermium arundinaceum, Schr		*					
294	Sphaerella Stellarinearum, Karst				*			
295	Plaespora Drabæ, Schr				*			
296	" herbarum, Pers					*		
297	Rhytisma Salicinum, Pers		*					
298	Excipula conglutinata, E & E				*			
299	Urocystis Anemonæ, Pers							

The last seven species were picked from the dead stems of a few specimens which retained some of the previous season's leaves and stems and were determined by Mr. J. B. Ellis, Newfield, New Jersey. They are very interesting. Nos. 294 and 295, not having been detected in America before. The former is found in Spitzbergen, the latter in Lapland, while No. 298 is found on Mount Paddo, in Washington Territory.

APPENDIX II.

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LIST AND NOTES

BY DR. R. BELL,

OF MAMMALS OF THE VICINITY OF HUDSON'S BAY AND LABRADOR.*

1. Star-nosed Mole, *Condylura cristata* (Desmarest). Common at Moose Factory at the southern extremity of Hudson's Bay.
2. Bat, a small species was seen at Moose Factory.
3. Hudson's Bay Squirrel, Chickaree or Common Red Squirrel, *Sciurus Hudsonicus* (Pennant).
4. Four-striped Ground-squirrel, Little Chipmunk, *Tamias quadrivittatus* (Say). Common along the Nelson and Churchill Rivers. The gray or black squirrel, *S. Carolinensis* (Gmelin), stated to range to Hudson's Bay, does not do so.
5. Great Northern Flying-squirrel. Common around Norway House. Occurs about Oxford House and at Nelson River House on the Churchill River.
6. Parry's Spermophile, *Spermophilus Parryi* (Richardson), Churchill, Nd. Specimens obtained from Eskimo from near Marble Island were kindly determined by Dr. Cowes.
7. Back's Lemming, *Myodes obensis* (Brants). Specimen from the neighborhood of Great Slave Lake, from Mr. MacF.

† 8. Wenusk or Woodchuck, *Arctomys empetra* (Sabine). The red or chestnut bellied variety of the woodchuck, *Arctomys monax*, (Linn.)

9. Common Meadow-mouse, northern variety, *Arvicola riparius*, var. *borealis* (Richardson). Specimens obtained at Nimaunjok and Stepart's Bay.

* Skins of the species marked thus (*) were obtained for the Museum

†10. Chestnut-cheeked Meadow-mouse, *Arvicola xanthognathus* (Leach). One specimen obtained at Churchill.

11. White-footed Mouse, *Musculus leucopus* (Rafinesque). Moose Factory. Specimens determined by Dr. Coues.

12. Musk-rat, *Fiber zibethicus* (Linn.) Common in Labrador as far north as Nain. On the east side of Hudson's Bay about as far north as Cape Jones. A few found at York Factory.

13. Beaver, *Castor Canadensis* (Kuhl.) On the west side of Hudson's Bay, northern limit of the beaver is rather south of the mouth of the Churchill River. A party of natives, who had found a family of beavers some distance up the North River between the Churchill and the Sea rivers, related the circumstance as unusual for that latitude.

14. Common Porcupine, *Hystrix dorsata* (Linn.) In Labrador the porcupine is met with as far north as Nain where it is common. It is met with everywhere in the region between the Great Lakes and Hudson's Bay, but is always scarce. Mr. Isbister, of the Nelson River House on the Churchill, informs me that it was once abundant there. It is rare between Lake Winnipeg and Hudson's Bay, but an individual is occasionally found as far north as York Factory.

15. Common American Hare, *Lepus Americanus* (Erxleben). Around Hudson's Bay the northern range of this species appears to correspond with that of the forest. It is common in some years at Fort Churchill.

16. Polar Hare, *Lepus glacialis* (Leach). On both sides of Hudson's Strait and on the west side of Hudson's Bay as far south as Fort Churchill.

17. Canada Lynx, *Lynx Canadensis* (Desm. Sp.) This animal in its apparently erratic migrations does not reach the verge of the forests. A few skins are obtained at Fort George on the East main coast and at York Factory. It has been occasionally rather numerous about Oxford House.

18. Common American Fox, *Vulpes fulvus* (Desm.) The Eskimo of Prince of Wales Sound, on the south side of Hudson's Strait, had in their possession skins of the red variety and they informed us that the black or silver grey variety was also found on this side of the strait.

†19. Arctic Fox, *Vulpes lagopus* (Linn.) These animals, or indications of their existence, were found at every place touched at by the expedition, in the Labrador, Hudson's Strait and Bay. A specimen shot on Nottingham Island about the middle of September had short fur, bluish grey on the back and white beneath.

20. Wolf, *Canis occidentalis* (Richardson). Wolves appear to be rather numerous on the north-west side of Hudson's Bay. The winter skins, of which I have seen a good many at Churchill, are almost white. A darky variety is rare.

21. American Otter, *Lutra Canadensis* (Sabine.) I was informed by the Eskimo that on the Labrador coast the otter is found as far north as Okak. On the east side of Hudson's Bay it is rare as far north as Little Whale River and on the west as far Fort Churchill. Its northern range seems to be inside of that of the forest. I have frequently consulted the Indians of the regions to the south and west of Hudson's Bay, in regard to the *Lutra destructor* of Barnston. They are universally of the opinion that there is only one species.

22. Skunk, *Mephitis mephitica* (Shaw Sp.) On both sides of James Bay; not very northern in its range.

†23. Common Weasel, *Putorius Noveboracensis* (DeKay). I have seen this weasel as far north as Fort Churchill. On the East-main coast it is said to extend to Little Whale River.

†24. Common Mink, *Putorius vison* (Brisson Sp.) The mink is of a more southern habit than the martin. Its range appears to fall considerably within the northern limits of timber.

25. Fisher, *Mustela Canadensis* (Schreber). The fisher does not appear to come to the shores of Hudson's Bay proper, although it ranges over the country around James' Bay.

26. Pine Martin, *Mustela Americana* (Turton). The northward range of the pine martin, both in the Labrador peninsula and on the west side of Hudson's Bay appears to correspond very closely with that of the limits of timber.

27. Wolverine, *Gulo luscus* (Linn. Sp.) Carcajou (Devil of the Indian). I ascertained from the Eskimo that this animal comes as far north as the southern shore of Hudson's Strait. The Eskimo bring their skins from the vicinity of Marble Island on the west side of Hudson's Bay.

28. Polar Bear. *Ursus maritimus* (Linn.) The polar bear is found at different seasons in all parts of Hudson's Bay, even to the southern extremity of James Bay, having been seen on two occasions at Moose Factory. The captain of one of the Hudson's Bay Company's ships informed me that he killed a large specimen, swimming in the open water, far from any ice, midway across the bay. During the expedition two were seen on Mansfield Island and several on Digges, of which three were killed (sup.—where their habit of eating grass is referred to). The Eskimo told us they were common in Hudson's Strait, and on

various occasions we saw their tracks on the floating ice. In the spring they come down the Labrador coast with the ice and are occasionally killed off the northern parts of Newfoundland.

29. Black Bear, *Ursus Americanus* (Pallas.) When at Nain on the Labrador coast the carcass of a black bear was brought for sale on board the "Neptune," and the Eskimo informed me that the animal is found on this coast as far north as Okak. On the East-main coast I have seen black bears as far north as Little Whale River. On the west coast of Hudson's Bay they are not known about Fort Churchill, but I killed one on the Churchill River about 100 miles from the mouth.

30. Barren-ground Bear, *Ursus arctos* (Richardson). This bear is found in the barren grounds south of Hudson's Strait. Capt. William Kennedy, who was formerly agent of the Hudson's Bay Company in the Ungava District, informed me that the skins they got there resembled those of the grizzly bear closely enough to pass as a variety of this fur in the trade. Some of the Hudson's Bay Company's officers regard the barren-ground as a variety of the cinnamon bear. In the barren grounds to the north-west of Hudson's Bay, I have been told that a large bear is found, which the Eskimo consider a variety of the polar bear, which has adopted a terrestrial life, and to which they have given the name of "blue" or "grey" bear.

31. Atlantic Walrus, *Odobænus rosmarus* (Malmgren). The walrus is found at all seasons in Hudson's Strait, and in the northern parts of the bay. During the winter the Eskimo kill a few off the headlands along the northern portion of the Labrador coast. From frequent enquiries I found that these people hold the opinion that the walrus feeds almost exclusively on white clams (*Mya truncata* and *M. arenaria*) but they cannot account for his being able to open them without breaking the shells. This is probably done by pressing them with the tongue against the teeth and hard palate and perhaps also against the inside of the tusks which are always more or less worn near the roots, especially on one side.

32. Bearded or Square-flipper Seal, *Erignathus barbatus* (Fabricius). This species appears to be common in Hudson's Strait. A few were seen by members of the expedition and their skins, some of them 11 or 12 feet long, were in the hands of all the parties of Eskimo we met with. In 1877 I noticed them occasionally on the East-main coast and in the end of September killed a female, in the mouth of the Moose River, which measured 8 feet 3 inches in length and was estimated to weigh upwards of 600

pounds. She had a fœtus about a foot long. A few cray-fish were found in the stomach.

33. Gray or Horse-head Seal, *Halichœrus grypus* (Fabricius). Skins of this seal were seen in the hands of the Eskimo in Hudson's Strait, and a large species known by the name is not uncommon along the East-main coast.

34. Hooded Seal, *Cystophora cristata* (Erxleben). This seal, of which a small number are killed every spring off the Labrador and Newfoundland coasts, is rather rare in Hudson's Strait, where we saw only a few skins among the Eskimo. Its skin is greatly prized for making the feet of moccasins, on both sides of Hudson's Bay, where the animal is called clapmatch and clapmutch by the Hudson's Bay people.

35. Harp Seal, *Phoca Grœnlandica* (Fabricius). This is the commonest seal at all seasons in Hudson's Strait and Bay as well as on the spring ice off the coasts of Labrador and Newfoundland. The young are called bedlimers and bedlamers by the Newfoundland sealers.

36. Harbor or Bay Seal, *Phoca vitulina* (Linn.). Rather common around Hudson's Bay and, apparently so, also in the strait, as we saw their skins in the hands of most of the natives we met. In Newfoundland it is called the dotard and doter. Around Hudson's Bay it is known by some as the spotted seal and fresh-water seal, and is said to follow up the rivers and lakes for long distances from the salt water.

37. Musk Ox, *Ovibos moschatus* (Zimm.) The musk ox is found only in the north-western part of the shores of Hudson's Bay, in the neighborhood of Chesterfield Inlet.

38. Reindeer, Barren-ground Caribou, *Cervus tarandus* (Kerr), var. *arctica* (Rich.) One of the commonest mammals of the barren grounds on both sides of Hudson's Bay and also on both shores of the strait.

In regard to the Cetacea, the white porpoise or white whale, *Delphinopterus catodon* (Linn.), is by far the most common being found in great numbers around both shores of Hudson's Bay and James' Bay and its southern extremity. They are not very often seen in the strait. The narwhal (39), *Monodon monoceros* (Linn.), is said to be occasionally killed in the northern parts of the bay. A dead specimen was cast ashore on the north side of the strait, near the Middle Savage Islands, last summer, and the "horn," a very large and old one, was brought by the natives to the observatory station at Ashes' Inlet.

I have obtained, from various sources, the common names of the

Cetacea frequenting the waters off the Labrador coast and also those found in Hudson's Bay, and have submitted the information to J. A. Allen, Esq., of the Museum of Comparative Zoology, Cambridge, U.S. In reply he has kindly written me as follows: "It is very difficult to identify the Cetacea by the vernacular names, except in a few cases. The 'Right Whale' and the 'Black Whale' are both doubtless (40), *Balæna cisarctica* (Cope). The 'Polar Whale' and 'Greenland Whale" must be (41), *Balæna mysticetus* (Linn.) The 'Sulpl bottom' and 'Finner' are names too vaguely applied to be atified; they both relate to some species of (42) Fin-back Whale, of which there are a number of species, belonging to several genera. The 'Hump-back' is (43) *Megaptera longimana* (Rudolphi). The 'Killer' is (44) *Orca gladiator* (Bonn.) The 'Puffer' or 'Puffing-pig' is (45) *Phocæna communis* (Less.) It is impossible to say what the 'small black whale with a prominent fin on his back' seen by you near Cape Chudhigh may have been, there being five or six species that might answer to this description. Besides those already mentioned, the following must be more or less common: Common Fin-back (46), *Physalus antiquorum* (Gray); Rudolphi's Rorqual (47), *Sibboldius laticeps* (Gray); Bottle-nose Whale (48), *Hyperoodon rostratum* (Chem.); White Whale (49), *Delphinoplerus catodon* (Linn.); Grampus (50), *Grampus griseus* (Cuv.); Black-fish (51), *Globiocephalus melas* (Naill.); White-beaked Dolphin (52), *Lagenorhynchus albirostris* (Gray); Exhrichts Dolphin (53), *L. acutus* (Gray); Common Delphin (54), *Delphinurus delphis* (Linn.) Of the large whales those most likely to occur in Hudson's Bay are the Hump-back, the Polar or Greenland Whale and the Fin-back."

APPENDIX III.

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LIST AND NOTES

BY DR. R. BELL,

OF BIRDS OF THE VICINITY OF HUDSON'S BAY AND LABRADOR.

Fifty-one of the species of birds mentioned in the following list were obtained during the expedition:—

Skins of 35 of these marked thus (*) were presented by Dr. Matthews of York Factory. Seven skins were secured by Dr. Bell, and the remaining ten species in the list marked thus (†) are those observed, but of which no specimens were secured.

The skins have been examined and named by Mr. Whiteaves.

* 1. Ruby-crowned Kinglet, *Regulus calendula*, Linn. York Factory.
* 2. Yellow Warbler, *Dendræca æstiva*, Gmelin. York Factory.
* 3. Pine-creeping Warbler? *Dendræca pinus?* Wilson. York Factory.
* 4. Great Northern Shrike, *Lanius borealis*, Vieillot. York Factory.
* 5. White-crowned Sparrow, *Zonotrichia leucophrys*, Forster. York Factory.
* 6. Baltimore Oriole, *Icterus Baltimore*, Linn. York Factory.
7. American Raven, *Corvus corax*, Wilson. One specimen shot and several seen about Port Burwell, 28th September.
* 8. Common Kingfisher, *Ceryle alcyon*, Linn. One specimen from York Factory. This bird is rare so far north.
* 9. Hairy Woodpecker, *Picus villosus*, Linn. York Factory.
† 10. Peregrine Falcon, *Falco peregrinus*, Linn. An old bird and two young ones beginning to fly were shot on Marble Island on 1st September.
* 11. Winter Falcon, or Red-shouldered Buzzard, *Buteo lineatus*, Gmelin. York Factory.
12. Greenland Gerfalcon, *Falco candicans*, Gmelin. Two specimens killed at Port Burwell in August and September.
* 13. American Goshawk, *Astur atricapillus*, Wilson. York Factory.
* 14. Marsh Harrier, *Circus Hudsonius*, Linn. York Factory.

† 15. Willow Ptarmigan, *Lagopus albus*, Gmelin. Abundant in the wooded part of Labrador and on both sides of Hudson's Bay as far north as the limits of timber and brushwood.

† 17. Rock Ptarmigan, or Rocker, *Lagopus rupestris*, Gmelin. Abundant on both sides of Hudson's Strait. Vast numbers of them were congregated on the southern part of Resolution Island on the 27th September, as if preparing to fly south across the Strait to the Button Islands and Cape Chudleigh.

* 17. Canada Grouse, *Canace Canadensis*, Linn. York Factory. The ruffed grouse, *Bonasa umbellas* (Stephens) also comes nearly as far north as York Factory.

* 18. Black-bellied Plover, *Squatarola helvetica*, Linn. York Factory.

* 19. Golden Plover, *Charadius virginicus*, Borck. York Factory.

* 20. Ring-necked Plover, *Ægialites semipalmatus*, Bon. York Factory.

* 21. Turnstone, *Strepsilas interpres*, Linn. York Factory.

* 22. Spotted Sandpiper, *Tringoides macularius*, Linn York Factory.

23. Buff-breasted Sandpiper, *Tryngites rufescens*, Vieillot. Port Burwell, 28th September.

24. Larger Yellow-shanks, *Totanus melanoleucus*, Gmelin. York Factory and Fort Churchill.

25. Hudsonian Curlew, *Numenius Hudsonicus*, Latham Abundant at Churchill during August. Mostly gone by 1st of September.

26. Eskimo Curlew, *Numenius borealis*, Forster. Also abundant at Churchill in August, only a few remaining till the beginning of September.

* 27. Virginia Rail, *Rallus virginianus*, Linn. York Factory.

28. Trumpeter Swan, *Cygnus buccinator*, Richardson. Nottingham Island, Marble Island and Churchill. This bird also breeds on the islands off the East-main coast of Hudson's Bay.

29. Snow Goose, White Wavy, *Anser hyperboreus*, Pallas. Beginning to arrive at Churchill 5th September.

30. Brant Goose, *Bernicla brenta*, Steph. Digges Island and Stupart's Bay, Cape Prince of Wales.

* 31. Pin-tail Duck, *Dafila acuta*, Linn. York Factory.

32. Long-tail Duck, Ka-ka-wee of the Outchipwais and Ha-ha-wai-ya of the Northern Crees. *Harelda glacialis*, Linn. York Factory.

* 33. Lesser Scaup Duck, Little Blue-bill. Howden of the people of Labrador and Newfoundland, *Fulix affinis*, Baird. Breeds in large numbers on Nottingham Island; the young beginning to fly in the last week of August. Churchill. York Factory.

34. Green-winged Teal, *Querquedula carolinensis*, Steph. York Factory.

35. American Eider Duck, *Somateria Dresseri*, Sharpe. In various parts of Hudson's Strait, at Churchill and York Factory. Common on the East-main coast.
36. Surf Duck, *Œdemia perspicillata*, Linn., Sp. Stupart's Bay, Cape Prince of Wales.
* 37. Red-breasted Merganser, *Mergus serrator*, Linn. York Factory.
38. Common Gannet, *Sula bassana*, Brisson. Near North Bluff.
39. Arctic Tern, *Sterna macrcura*, Naum. In Hudson's Strait and along the west coast of Hudson's Bay.
* 40. Bonaparte's Gull, *Chroicocephalus Philadelphia*, Ord. Sp. York Factory.
* 41. Black-headed Gull, *Chroicocephalus atricilla*, Linn. York Factory.
† 42. Common Kittiwake, *Rissa tridactyla*, Linn. Numerous along the Labrador coast, especially around Cape Chudleigh.
* 43. Long-tailed Skua, *Stercorarius Buffoni*, Boie. A specimen of this this bird shot near York Factory was presented by Dr. Matthews in 1880.
44. Fork-tailed Gull *Xema Sabinii*, Sabine. Port Burwell, September.
45. Herring Gull, *Larus argentatus*, Brünnich. Hudson's Strait and Bay.
46. Slender-billed Fulmar, *Procellaria tenuirostris*, Audubon. Port Burwell, 28th September.
* 47. Common Loon, *Colymbus torquatus*, Brünnich. York Factory.
† 48. Arctic Loon, *Columbus arcticus*, Linn. Male, female and young (nearly full-grown) shot on Nottingham Island, 28th August.
† 49. Red-throated Loon, *Colymbus septentrionalis*, Linn. One specimen shot on Marble Island, 2nd September.
* 50. Pied-billed Grebe, *Podilymbus podicipes*, Linn., Sp. York Factory.
† 51. Black Guillemot, *Uria grylle*, Linn. Labrador coast, Hudson's Strait and Bay.
52. Least Auk, *Mergulus alle*, Linn. One specimen shot at Port Burwell, 28th September. Common in this neighbourhood.

(See also List of Birds by the writer in Report of the Geological Survey for 1878-79, p. 67c, and Notes on the Birds of Hudson's Bay in the Transactions of the Royal Society of Canada, Vol. I, Sect. IV, p. 49, 1882, in which many additional species are given.)

APPENDIX IV.

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LIST

BY PROF. S. J. SMITH, YALE COLLEGE.

OF CRUSTACEA FROM PORT BURWELL,

COLLECTED BY DR. R. BELL IN 1884.

Eupagurus Kröyeri Stimpson.

Four specimens.

Ceraphilus boreas Kinehan ex Hipps.

One female 64^{mm} in length.

Hippolyte Fabricii Kröyer.

Two females.

Hippolyte Phippsii Kröyer.

One male and eleven females. The single male, 29^{mm} long, has only one supra-orbital spine each side.

Hippolyte polaris Ross ex Sabine.

Five males and eleven females. One female gives the following measurements: length from tip of rostrum to tip of telson, 68^{mm}; length of carapax including rostrum, 24^{mm}; length of rostrum, 10.4^{mm}; breadth of carapax, 11.2^{mm}.

Hippolyte Grœnlandica Miers ex J. C. Fabricius.

Eight males and seven females. The males from 43 to 68^{mm} long, and the females from 45 to 93^{mm}.

Pandalus Montagui Leach.

One large female over 100^{mm} long.

Mysis oculata Kröyer ex O. Fabricius.

Fragments of a single specimen.

Anonyx nugax Miers ex Phipps.

One specimen.

Pleustes panoplus Bate ex Kröyer.

One specimen.

Œdiceros lynceus M. Sars.

One specimen.

Gammarus locusta Fabricius. (G. *ornatus* M. Edwards.)

Many specimens.

Rhachotropis aculeata Smith. (*Tritropis aculeata* Boeck.)
Four females.

Eya psora Kröyer ex Linné.
Two specimens.

Pleryxus abdominalis Lilljeborg ex Kröyer.
One specimen on *Hippolyte polaris*.

Arcturus Baffini Westwood.
Three specimens. The body of the largest specimen measures 46^{mm} in length and the antennæ 51^{mm}.

LIST

BY J. F. WHITEAVES,

OF MARINE INVERTEBRATES FROM HUDSON'S STRAIT,

COLLECTED BY DR. R. BELL IN 1884.

1. From Ashe's Inlet, Upper Savage Island, N. Side of Hudson's Strait.

Mollusca.

Pecten Islandicus, Müller.
Modiolaria nigra, Gray.
Modiolaria lævigata, Gray.
Nucula inflata, Hancock.
Leda pernula, Muller.
Leda minuta, Muller.
Yoldia myalis, Couthouy.
Cardium ciliatum, O. Fabricius.
Aphrodite Grandandica, Chemnitz.
Astarte (*Tridenta*) *lactea*, Broderip and Sowerby.
Astarte (*Nicana*) *Banksii*, Leach.
Astarte compressa Linné, non. Mont. (= *A. elliptica*, Brown.)
Cardita borealis, Conrad.
Macoma calcarea, Chemnitz.
Mya truncata, L.
Saxicava pholadis, L.
Acmæa rubella, O. Fabricius.
Margarita striata, Broderip and Sowerby.
Machæroplax varicosa, Mighels (Sp.)
Lunatia Grandandica, Beck.

Natica clausa, Broderip and Sowerby.
Trichotropis borealis, Broderip and Sowerby.
Turritella erosa, Couthuoy.
Turritella reticulata, Mighels.
Admete viridula, O. Fabricius.
Trophon craticulatus, O. Fabricius.
Buccinum tenue, Gray.
Buccinum Grœnlandicum, Chemnitz.

ANNELIDA.

Pectinaria granulata.

CIRRIPEDIA.

Balanus crenatus, Auctorum.

2. FROM PORT BURWELL, CAPE CHUDLEIGH.

ECHINODERMATA.

Ophioglypha Sarsii, Lutken.
Ophioglypha nodosa, Lutken.
Ophiopholis aculeata, O. F. Muller.
Asterias polaris, Muller and Troschel.
Asterias littoralis, Stimpson.
Strongylocentrotus Drobachiensis, Muller.

BRACHIOPODA.

Rhynchonella (*Hypothiris*) *psittacea*, Chemnitz.

MOLLUSCA.

Modiolaria nigra, Gray.
Modiolaria lævigata, Gray.
Modiolaria nigra, Gray.
Nucula inflata, Hancock.
Leda pernula, Muller.
Leda minuta, O. Fabricius.
Yoldia myalis, Couthuoy.
Cardium ciliatum, O. Fabricius.
Aphrodite Grœnlandica, Chemnitz.
Astarte (*Triodonta*) *lactea*, Broderip and Sowerby.
Astarte (*Nicania*) *Banksii*, Leach.
Lyonsia arenosa, Moller.
Macoma calcarea, Chemnitz.

Mya truncata, L.
Margarita striata, Broderip and Sowerby.
Machæroplax obscura, Couthuoy. (Sp.)
Natica clausa, Broderip and Sowerby.
Amauropsis Islandica, Gmelin.
Trichotropis borealis, Broderip and Sowerby.
Turritella erosa, Couthuoy.
Turritella reticulata, Mighels.
Buccinum tenue, Gray.

The following additional species from Port Burwell have since been recognized by Prof. A. E. Verrill.

ECHINODERMATA.

Ophioglypha robusta, Ayres.
Pentacta frondosa, Jaeger.

TUNICATA.

Cyrthia carnea, (Agassiz.)

MOLLUSCA.

Margarita helicina, O. Fabricius, (very large.)
Bela pleurotomaria, Couthuoy.
Bela bicarinata, Couthuoy, var. *violacea*.
Bela incisula, Verrill.

ANNELIDA.

Lepidonotus squamatus, L.
Harmothoe imbricata.
Ammochares, Sp.
Thelepus circinatus.
Sprorbis validus, Verrill.

APPENDIX V.

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LIST

BY H. H. LYMAN,

OF LEPIDOPTERA,

COLLECTED BY DR. ROBERT BELL IN HUDSON'S STRAIT IN 1884.

The collection consists of twelve specimens which, as far as can be determined, are as follows:—

Argynnis polaris, Boisd. Two specimens taken at Ashe's Inlet, north shore, August 13th. This species extends from Labrador to the extreme north, having been brought back by the naturalists attached to the "Alert," and "Discovery" Arctic Expedition.

Chionobas crambis, Freyer. Two specimens, Ashe's Inlet, August 13th; determined by Mr. W. H. Edwards. This has heretofore been regarded as a synonym of *C. Semidea*. Say, which flies on Mount Washington and in Labrador, but Mr. Edwards now regards it as distinct.

Laria Rossii, Curtis. One specimen, Ashe's Inlet, August 13th.

Agrotis dissona, Moeschler. One specimen, Ashe's Inlet, August 13th. This and the last species are very great rarities in collections.

Anarta Richardsoni, Curtis. Two specimens, Cape Chudleigh, Aug. 7th.

Tephrosia? ———. Three specimens in too poor condition for accurate determination. Cape Chudleigh, August 7th.

——— One specimen undeterminable, Cape Prince of Wales, August 17th.

I am indebted to Mr. J. B. Smith of Brooklyn, an authority on the Noctuidæ, for the determination of the moths. There are no specimens of *Colias* in the collection, though one would naturally have expected to find them.

LIST

BY J. B. SMITH, BROOKLYN,

OF COLEOPTERA,

COLLECTED BY J. R. SPENCER AT FORT CHURCHILL.

(Per favor of Mr. James Fletcher, Ottawa.)

1. *Carabus baccivorus.*
2. *Pachyta liturata.*
3. *Acmæops proteus.*
4. *Criocephalus obsoletus.*
5. *Neoclytus conjunctus.*
6. *Amara similis.*
7. *Amara hyperborea*
8. *Pterostichus Hudsonicus.*
9. *Cryptohypnus abbreviatus.*
10. *Colymbetes sculptilis.*
11. *Gaurodytes grisipennis* (?)
12. *Dytiscus confluens.*
13, 14. Two species unknown to Mr. Smith.