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## NOTES

#### ON THE

# NORTHERN LABRADOR FISHING GROUNDS.

By H. G. HIND.

1876.



#### ST, JOHN'S,

#### 8th November, 1876.

I have the honour to submit for the information of His Excellency, the enclosed "Notes on the Northern Labrador Fisheries."

Since the sketch Charts illustrating these Notes were sent to you in September last, I have had the opportunity of seeing and studying Commander Maxwell's Chart of the Labrador from Sandwich Bay to Nain, published during the past summer. This most valuable and timely addition to our knowledge of the Labrador Coast will serve to illustrate the accompanying Notes respecting its Fisheries, and form to a certain extent the basis of future enquiry into the resources of these Northern Seas.

I am convinced that investigations extended over another season, and having the study of the Fisheries as far as Cape Mugford or Cape Chudleigh in view, would lead to the acquisition of information of great value to the commercial interests of Newfoundland, if pursued in a scientific manner, and the deductions compared with the known results of similiar enquiries on the Coasts of the United States, the Dominion, and Northern Europe.

I have the honour to be,.

Your obedient servant,

HENRY G. HIND:

The Hon. F. B. T. CARTER, M.E.C.,

Attorney General.

SIR,



## NOTES

#### ON THE

### NORTHERN LABRADOR FISHING GROUNDS.

THE Fishing Grounds on the Atlantic Coast of the Labrador, as far North as Sandwich Bay, have been occupied to a greater or less extent, for one hundred and twenty years. Those extending from Sandwich Bay to Cape Harrison or Webeck, have also been visited by Fishing Craft for a generation or more; but north of Aillik, about 40 miles from Cape Harrison, the Coast has only been frequented by Newfoundland cod-fishing craft, during the last fifteen years. A Quebec and a London House have possessed detached Salmon Fishing Stations as far north as Ukkasiksalik or Freestone Point, (Lat, 56, Long, 61,) for about 30 years, but these have all passed into the hands of the Hudson Bay Company. Until the recent publication of Commander Maxwell's Surveys, our knowledge of the Labrador Coast has been chiefly derived from the Moravian Missionaries, and the surveys of certain harbours far removed from one another, by the officers of Her Majesty's vessels.

A glance at Commander Maxwell's Charts, when compared with any document published previous to 1876, shows how little is known respecting the Geographical outlines of this extended coast line, which, from its amazing fish wealth, promises to become a very important commercial adjunct to Newfoundland.

The leading characteristics of the coast north-west of Aillik are as follows :--

1st. The shore line is deeply servated by a constant succession of profound and narrow fiords stretching from 30 to 50 miles into the interior.

2nd. It is fringed with a vast multitude of Islands, forming a continuous archipelago from Cape Aillik to Cape Mugford, averaging twenty miles in depth, trom the mouth of the fiords seawards.

3rd. Outside of the Islands and about 15 miles seawards from them, are numerous banks and shoals, which form the great autumnal summer and spring feeding grounds of the cod, while ontside of the shoals, there appears to be a second range of banks, which are probably their winter feeding-grounds. 4th. The island-studded area forms an immense cod-fishing cound, which covers between Cape Harrison (Webeck) and Cape Mugford, a boat fishing-ground exclusive of the shoals and banks.

French boat fishing-ground on the coast of Newfoundland. For the sake of distinction 1 have styled the area under review, "The Northern Labrador Fishing Grounds," beginning at Cape Harrison (Webeck) and, for the present at least, terminating at Cape Mugford,

outside, nearly as large as the combined area of the English and

#### AREA OF THE NORTHERN LABRADOR BOAT FISHERY.

The following table shows approximately the area of the boat fishing-grounds about the Island of Newfoundland, and the Northern and Southern Divisions of the Labrador. From this table it will be seen that the area of the Northern Labrador fishing-grounds alone, exclusive of the Banks, amounts to about five sixths of the entire area of the British and French boat fishery on the coast of Newfoundland. The area of the inner range of banks cannot be even approximately stated :

#### Comparative Table of Newfoundland and Labrador Fishing Ground Areas.

Nonwrupy Landson Deed D' Land C. H	Area of Fishing Ground, Geo. So. Miles.
rison to Cape Mugford, 260 miles averaging 20	)
miles deep	. 5200
Cape St. John via Cape Bauld to Cape Ray, 696	
miles, by three miles deep—Shore Boat Fishery	2088
Cape Ray to Cape Race, 573 miles, 3 miles deep-	
East Shore of Newfoundland Boat Fishery.	1719
Cape Race to Cape Bonavista, 294 miles, 3 miles	
deep-Shore Fishery	882
Fishery—Cape Bonavista to Cape St. John, 225	
miles, 3 miles deep—Shore Fishery	675
Fishery-among islands in Bon wista Bay and Bay	
of Notre Dame, 120 miles, 7 miles deep	840

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Table of Comparative Areas Continued.	
Area of British Newfoundland Boat Fishery Area of French Newfoundland Boat Fishery	Sq. Miles 4116 2088
Total area of Newfoundland Boat Fishery	6204
Area of Northern Labrador Boat Fishery— Cape Harrison to Cape Mugford Area of Southern Labrador Boat Fishery— Cape Harrison to Blanc Sablon, estimated five miles	5200
deep	1900
Total area of Labrador Boat Fishery	7100

## PHYSICAL OUTLINES OF THE COAST.

As in Norway so on the Labrador, the whole coast from the Straits of Belle Isle to Hebron is deeply cut by profound Fiords penetrating the land from 30 to 70 miles. These Fiords have been mapped as far as Hamilton Inlet by the officers of Her Majesty's vessels, but beyond that point no surveys have been made and published, with the exception of those before mentioned. As an illustration of one of the unsurveyed Fiords, I append a sketch plan made this summer of Kypokok Bay, the next Bay north of Aillik. It is fifty-three miles deep, and has an average breadth of three miles. Opposite the Hudson Bay Co.'s Post, 35 miles from Aillik Head, the water is more than fifty fathoms deep, although not above a mile across. This Bay or Fiord has been excavated by glaciers, like all the other Fiords on this coast, and the innumerable Islands off the coast are rocky eminences which have escaped the general glacial denudation. But the glaciers of Labrador have probably left even more valuable records in the form of moraines, of their early existence here, than deep Fiords or innumerable islands, These are the shoals or banks which lie some fifteen miles outside of the Islands, and on which ice-bergs strand in long lines and in groups. I have styled them the Inner Range of Banks, to distinguish them from a supposed Outer Range in deeper water, and where larger ice-bergs also sometimes take the ground. The inner banks as far as they are known, are stated by fishermen to have from twenty to forty fathoms of water on them.

#### ABSENCE OF ISLANDS ON THE SOUTHERN LABRADOR.

The Admiralty Chart portrays a very important confirmation of , the Labrador Const line from St. Lewis Sound to Spotted Island. The tread between the Battle Islands, South of St. Lewis Sound, und the Spotted Island, (Domino Run) a distance of '65 miles, is due North, and with very few exceptions, there are no Islands off the Coast throughout this distance, but as soon as the Coast Line begins to turn North-west, Islands are numerous and continually increase in number as far as Cape Mugford, and even towards Cape Chudleigh. Between Cape Harrison and Cape Mugford the Island again may be estimated as being a depth of twenty miles from the mouth of the The cause of the general absence of Islands South Fiords seawards. of Spotted Island, can probably be traced to the never ceasing action of Northern ice, driven on the Coast Line where it suddenly makes its Southerly bend, by the influence of the rotation of the earth upon the Arctic Current. This current sweeps past the Labrador with a speed of from 11 to 2 knots an hour; and a Westerly pressure, due to the earth's rotation, estimated at about eleven inches. That is to say, the mean level of the sea on the Coast of Labrador is about eleven inches above the level it would assume if uninfluenced by the carth's rotation. As soon as the ice-ladened current reaches the Spotted Island it is in part relieved from this pressure by the tread of the Coast from South-east to due South, hence the current changes its course Southerly and on to the land. But the effect of this sudden change in this direction of the current near the shore is to throw the ice-bergs on to the coast from Spotted Island to Cape St, Lewis, where they may be seen stranded each year in great numbers. The Islands which doubtless once existed here, have been removed by constant abraision acting uninterruptedly for ages, and with the 1s. lands the moraines lying seawards. We may thus trace the cause of the vast difference between the distribution of stranded ice-bergs south of Spotted Island and north west of it. In one case they are stranded on and near the coast line, wearing it away and deep ening the water near it, assisted by the undertow; in the other case they are stranded some fifteen miles from the Island fringe, and continually adding to the Banks the debris they may bring, in the form of mud streaks, from the glaciers which gave them birth in the far north and north east. It is more than probable that this distribution of ice-bergs has a very important bearing upon the food and feeding

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grounds of the cod, which justifies me in referring here with so much detail to the action of glacial ice.

## RELATION OF THE CODFISH TO STRANDED ICE-BERGS.

Upon what forms of life do the cod feed on the Northern Labrador coast, where the summers are so short, the caplin, the herring, the squid and even launce comparatively scarce, and where ice bergs continually abound ? The answer may be expressed in one word-ernstacenus. These are infinite in number, from the minute sealice of the fishermen to a large crustaceau resembling a prawn : crabs, too, are very numerous, as well as mellusks. Although the caplin ceases to appear on the coast in large schools above the latitude of Nain, the herring is not numerous beyond Ukkasiksalik, the squid is not found beyond Domino Run, and the launce is the only known Southern Labrador fish which visits the Northern consts in great numbers, yet crabs, prawns and "herring bait" with medusaoccur in vast numbers and form with mollusks the chief food of the cod. The officers in charge of the Hudson Bay Co.'s Post at Ukkasiksalik informed me that at the more Northern Hudson Bay Posts, if seals-were left in the fall of the year for a single night in the nets, the head was sure to be cleaned to the bone by prawns. He also stated that in the Northern waters opposite Hebron, Lamp. son and Nachwack, the cod feed on a small fish bearing a great rescublance to the ordinary tommy-cod, but that crustaceaus were their chief food. The connection existing between ice and the food of the cod is not apparent at the first blush, but when it is borne in mind that infusatorial forms abound in sea-water in the immediate vicinity of arctic ice, and that on these minute creatures, larger forms of life find sustenance, which again become the food of crustaceaus and different species of fish upon which the cod are nourished, the chain is complete, and the relation of stranded ice-bergs to fish life on the Labrador becomes apparent. It has been shown by the labours of the United States Fishery Commission, that the cod, which once existed to a large extent on the New England Coast, has been starved out by the destruction of its food, and valuable fisheries ruined, but not beyond the power of restoration, if the remedial measures suggested are faithfully carried out and sufficient time allowed. But on the Labrador, particularly the Northern portion, through the unfailing advent of Arctic ice, a perennial supply of food is indirectly supplied to the cod, forbidding the idea of starvation on these coasts.

#### THE INNER RANGE OF BANKS.

The foundation of the inner range of banks consists very probably, as already stated, of glacial moraines. In their present state they may reasonably be assumed to be formed in great part of remodelled debris brought down by the same glaciers which excavated the deep Fiords,

The absence of deposits of sand in the form of modern beaches on every part of the Labrador Coast this season, except one, was very marked. The exceptional area observed lies between Sandwich Bay and Hamilton Inlet, Gape Porcupine being the cen're. It is protected from the Northern swell of the ocean by the Indian Harbor Islands and promontory. Here large deposits of sand are seen covering many square miles in area. The reason why sandy beaches are not in general found on this Coast, notwithstanding that enormous quantities of rock are annually ground up by coast ice, and ice pans driven on the shore, arises from the undertow carrying the sand seawards and depositing it on the shoals or banks outside of the Islands. The undertow on this coast is remarkably strong, and it aids the formation and extension of the inner range of banks and consequently of the feeding and spawning grounds of the cod to a very great degree.

It may be advisable here to advert to a popular error which assumes that the depth of water in which an ice-berg grounds is indicated by the height of the berg above the level of the sea. It is commonly stated that while there is one-ninth above, there will be eight-ninths of the berg below the sea level. This is approximately true only with regard to volume or mass of the berg, not with regard to height and depth. A berg may show an elevation of one hundred feet above water, and yet its depth below may not exceed double that amount, but its volume or mass will be about eight times the mass it shows over the surface. Hence, while icebergs ground in thirty and forty fathoms of water, they may expose a front of one hundred or one hundred and fifty feet, the broad, massive bas lev

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which unds is ea. It ere will pproxiot with of one exceed t eight cebergs a front nassive base supporting a mass about one-ninth of its volume above the sea level.

## MOVEMENTS OF THE COD ON THE LABRADOR.

The following tables show the periods of first arrival and last catch of Cod on the Newfoundland and Labrador coasts. In framing these tables I have been careful to eleminate extreme seasons, for the Cod have been known to approach the shore during an exceptionally early season, a fortnight or three weeks sooner than during the average of years. Early and late springs occur in the movements of fish just as irregularly as in the movements of migratory birds, or in the leafing and flowering of plants. The salmon and the cod generally come within a week of one mother, and the Eskimo of Ukkaseksalik have a tradition that the salmon may always be looked for on the day of the first spring tide after the 16th July. In 1875, a very late season, codfish were not taken before the 7th August; this year they came in on the 20th July, and this accords with the experience on other parts of the coast.

An impression prevails among fishermen that the caplin are "moving North," and that the cod are following them. This opinion is not shared by the missionaries who have occupied the coast for a century. They have known the caplin as far north as Nain for many years. On the Admiralty Chart of Port Manvers (lat. 57, long. 62.7.) thirty miles north of Nain, constructed by Capt. Manby in 1808 and published in 1871, Caplin Bay is the name given to an anchorage at Port Manvers, from which it is manifest that caplin were seen there sixty-eight years ago, or half a century before the fishermen passed Aillick, Bay, or even Cape Harrison, nearly 200 miles to the South East. The caplin, however, is not known to the officers of the II. B. Company's Post, or to the missionaries beyond Cape Mugford. Table showing the approximate mean date of arrival, mean date of closing fishery, and mean length of the fishing for cod in North Eastern Newfoundland, Southern and Northern Labrador.

Lat.	Locality.	Mean date of arrival.	Mean date of close of fishery.	Mean length of fishing season.
$\begin{array}{r} 47.30 \\ 48.20 \\ 48.30 \\ 50 \\ 49.30 \\ 51 \\ 51.30 \end{array}$	NEWFOUNDLAND. Conception Bay Bonavista Bay Notre Dame Bay Cape St. John to Par. Pt. White Bay. Cape Rouge Harbour Cape Bauld to C. Onion	1st June 10th " 20th " 20th " 10th " 10th " 20th "	20th Nov. 10th " 10th " 1st " 1st " 1st " 20th October	> 143 days.

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## Over Four Degrees of Latitude.

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	SOUTHERN LABRADOR.				]
52.0	Chateau Bay	20th	June	1st October	1
	Batteaux	12th	"	66	
54.30	Indian Harbour	15th	**	66	Si days.
54.54	Cape Harrison	18th	"	46	j

### Over Three Degrees of Latitude.

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NORTHERN LABRADOR.				
55.9 Aillik	20th	July	1st October	in l
55.12 Kypokek	20th	66	64	
55.27 Hopedale	20th	66		
53.30 Double Island Harbour	22th	66	66	
56 Ukkasikaalik	28th	66	• •	> 52 days.
56.30 Nain	28th	66	66	1
57.30 Okak	28th	"	"	
58,30 Hebron	15th	Aug.	25th Sept.	
58.46 Lampson	15th	"	15th "	j

## Over Three and a Half Degrees of Latitude.

, mean date d in North or,

ean length f fishing season.

43 days,

7 days.

2 days,

From this Table, imperfect as it is, we may deduce the following law: "Over an area extending northerly from Conception Bay for seven hundred miles, the cod approach the shore about one week later for every degree of latitude we advance to the north."

These Tables show also that for a period of about forty days the cod-fishery goes on simultaneously during August and September, throughout the length of a coast line extending from latitude 47° to lat. 58, 30, or more than seven hundred statute miles in one continnous line. Hence it appears that the migrations of the schools of this fish are merely from deep water winter teeding grounds to the nearest coast spawning grounds, and from the coast to the nearest deep water feeding grounds again.\* The coast migrations during the summer months appear to be of equally limited extent, and schools 'of cod frequenting any particular coast, may be said to be indigenous to it.

On the Labrador, especially in well-known deep Bays, such as Hamilton Inlet, the coast movements of the fish appear to be very regular and determined to a large degree by the tidal currents. The Caplin generally precede the Cod by a few days, and these fish are known to approach the coast and enter the sandy coves for the purpose of spawning. The same law which guides the movements of the cod affects also the periods of spawning of the caplin. I saw numerous schools of fish spawning in Trinity Bay on the 27th June, a month later they spawn in Kypokok Bay, and still later further to the north.

## PRESENT STATUS OF THE NORTHERN LABRADOR FISHERY.

About four hundred fishing craft, from eighteen to ninety tons burden, are supposed to have passed Cape Harrison this season, Taking the average of the entire fleet, they carried each eight men; three fishing boats and one shore boat. Out of the 3200 hands, we n ay assume that 2400 were actually engaged in fishing. The estimated catch was 60 quintals per man; or in the aggregate 144,000

\* This law regulating movements of several species of fish has long since been recognized in other countries. quintals. This work was accomplished in an average aggregate of twenty-four fishing days, and to a large extent with the jigger,\* that is, without the use of bait. Allowing 130 fish to the quintal the number taken would be about eighteen millions, the number wounded and lost about four and a half millions, although some fishermen consider that one fish out of three is wounded by the jigger and lost, when the fish are very numerous.

During the gale of the 11th and 12th Scptember there lay next to us in Indian Harbour off Hamilton Inlet, a small craft of 30 tons burden, just arrived from off Nain. She had been fishing about the Islands near the Missionary Station in lat. 56. 40, about 600 miles north west of St: John's, and in three weeks had taken three hundred quintals. Her complement consisted of six men and two fishing boats. She arrived, like all the fishing fleet this year, too late to take advantage of the season. The cod had "struck in" many days before she commenced fishing. Had she arrived a fortnight earlier, she might easily have taken 80 quintals to the man in place of 50, but she had used all her salt, and the crew were satisfied with the result. Her fishing days were eighteen in number, excluding Sundays, which are always observed by fishermen on this coast.

Another craft, also lying alongside and hailing from Notre Dame Bay, was of sixty tous burden, her complement, 12 men and 4 boats. She reached the Islands off Hopedale (Lat. 55. 27) on the 22nd July, fished for six weeks and took 700 quintals of fish or about 60 quintals per man. She takes her green fish direct to Notre Dame Bay to make there. No fish are made or cured on this shore, as yet, north of Long Island Tickle, some twenty-five miles north-west of Cape Harrison.

Hitherto on the Northern Labrador Coast, the jigger, as already stated, has been almost exclusively used ; it is only lately that launce have been tried as bait, and with marked success. But it is well known that only the smaller sized cod come into shallow water, the larger fish remaining to feed and spawn on the banks outside and in deeper water. Very few attempts have been made to fish on the

\* Bait was used in Stag Bay, but north of Aillik almost all the fish were taken with the jigger. The launce is stated to have been used to a small extent, as well as IMFORTED bait.

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h were small Labrador Banks, but when tried, I have been assured by trustworthy persons, that large fish have always been taken with bait.

Larger boats than those used about the Islands are required for this kind of fishing; indeed a totally different organization and equipment will be necessary for the Northern Labrador Bank Fishery, which appears destined to become, under proper encouragement and management, the fishery of the future.

#### THE CLIMATE.

Experience, now extended over twelve years, shows that the seasons are sufficiently late and long, to permit Newfoundland fishermen to come from their homes after their spring fishing is over there, and their garden work attended to. They may arrive on the Northern Labrador Fishing Grounds from the tenth to the twentieth of July, or even later if they go north beyond Nain. They may return in general by the tenth to the twentieth of September, to Southern Labrador rooms, or even to their homes, with full fares of green fish.

The extremities of many of the deep Fiords from Cape Harrison to Ukkasiksalik or Freestone Point, a distance in an air line of 120 miles, contain timber fit for spars, for the construction of "fore-andafters" and for all ordinary building purposes. The climate there, namely, at the bottom of many of these deep Fiords, permits of the cultivation of potatoes and other garden vegetables. Between Aillik and Ukkasiksalik, there are at present about sixty resident settlers in the deep Fiords, most of whom have been in the service of the Hudson Bay Co. or the fishing firms already named, and some of them are married to Eskimo women.

There are several other points of great interest in regard to the Northern Labrador which are worthy of notice, but the details would swell this paper to dimensions far exceeding those of a brief descriptive outline sketch of a comparatively new field for that kind of enterprise and industry in which Newfoundland is so distinguished, and from which she annually derives so much wealth. The expansion and preservation of her fishing grounds for the use of her own people appears to claim, however, thoughtful and liberal considerations, not only from those who may profit by it, but trom those also, who may be able to assist in lessening the difficulties with which it is beset, in ameliorating the hardships inseperable from its pursuit, and in aiding in developing the resources of the vast area it may yet be made to occupy.

## HENRY G. HIND.

St. John's, November 8th, 1876.

