[*Published by authority of the Surveyor-General of Newfoundland.*]

HAND-BOOK

OF

NEWFOUNDLAND:

CONTAINING AN ACCOUNT OF ITS

AGRICULTURAL AND MINERAL LANDS, ITS FORESTS,

AND

OTHER NATURAL RESOURCES.

With a Map of the Island.

SECOND EDITION.

BOSTON:
PRINTED BY DOYLE AND WHITTLE,
1888.

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PREFACE.

THE want of a Hand-book, containing full and accurate information regarding the various natural resources of Newfoundland, has long been felt. In the Crown Lands' Department constant inconvenience is caused by the want of some authoritative compendium, adapted to popular use, containing information regarding the Crown Lands, the Forests, and Minerals of the Colony.

The absence of such a manual suggested to me the compilation of a small volume containing the latest and most trustworthy information on these subjects. Fortunately I prevailed on the Rev. M. Harvey to undertake the preparation of this Hand-book. His knowledge of the subject, as evinced in his various works on Newfoundland, is a sufficient guarantee that this work will be safe in his hands, and will be found accurate and adapted for general circulation.

He has condensed within a moderate compass the whole of the information regarding the extent, the situation, and character of the lands adapted to agricultural purposes, which had been accumulated for years, but was inaccessible to the general public. He has also given full information regarding the lumbering and mining districts. An abstract of the

amended Crown Lands' Act is also furnished, together with other important information.

Such a compendium can hardly fail to prove useful in promoting the settlement of the country and the development of its natural resources.

J. O. FRASER,
Surveyor-General.

ST. JOHN'S, NEWFOUNDLAND, Oct. 2, 1885.

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FALSE IMPRESSIONS OF THE SOIL AND CLIMATE.

Up to a comparatively recent period the belief was almost universal that the island of Newfoundland was utterly barren, and its natural resources of the poorest description. Most people had the impression that it was a dismal, fog-enveloped country, and that its savage climate and poor soil precluded all attempts at agriculture. Its only resource was supposed to be the fish in its encompassing seas; while the island was regarded as a barren rock, on which a limited number of fishermen might obtain a precarious subsistence by catching and curing fish. The interior was pictured as a howling wilderness of swamps, bogs, and rocks. Its forest-growths were represented to be of the most wretched and stunted description; while the idea that it might contain some valuable minerals was never entertained.

How did these erroneous and unfounded impressions arise? The island is England's oldest colony. It has been inhabited for more than three hundred years by an English-speaking race. How came it, then, to be so long misknown and misrepresented?

CAUSES OF THE UNFAVORABLE IMPRESSIONS.

A number of circumstances combined to create these unfavorable impressions regarding the soil, climate, and natural resources of the country, and to retard the development of its capabilities. Strange to say, the immense fish-wealth of

its surrounding seas was the principal cause of the resources of the land being overlooked and neglected. The first comers were attracted by the productive and inexhaustible fisheries around the shores and on the Great Banks. These fisheries were at first carried on by capitalists living in the west of England, who sent out fishing-vessels and fishermen early in the summer to prosecute this industry, and to return on the approach of winter, bringing with them the produce of the season's toils. This fishery, which was mainly one for catching and curing codfish, proved to be very lucrative. Speedily, a large amount of capital was invested in it; great fortunes were built up, and it gradually fell into the hands of a number of wealthy and powerful monopolists.

MONOPOLISTS AND THE FISHERIES.

It was their interest to retain the fisheries entirely in their own hands, and to keep the shores of the island clear of all interlopers, for the exclusive use of their own servants, the fishermen from England. Their grand aim, therefore, was to prevent the settlement of the island, and to compel the fishermen to return home when the fishing season was at an end. Should a resident population spring up, they might become formidable competitors with the "merchant adventurers," as they were called, and greatly lessen their profits. Their whole policy, therefore, was directed to the one object of preventing colonists from taking up their abode in the island.

UNJUST LAWS.

In this they were wonderfully successful for a long period. Being an influential class of men, they were able, by their representations, to persuade the British Government to enact laws which prohibited any one from occupying and cultivating the land, under heavy penalties, and even from erecting houses, except such as were absolutely necessary in carrying on the fisheries. The captains of the fishing-vessels were obliged to give bonds to bring back to England each year as

many fishermen as they carried out. The successive governors were forbidden to make any grants of land or to permit the erection of dwelling-houses, or to grant any privileges which might encourage persons to remain in the island.

THE FISHERIES A NURSERY FOR SEAMEN.

It may seem strange to us in these days that any government should be induced to pass such laws. The consideration which the monopolists pressed upon the English legislators was, that these fisheries were the grand nurseries for training hardy seamen to man the navy; and that, if any number of them settled in Newfoundland, their services would be lost to the nation. Further, these selfish men never ceased their efforts to discredit the country as a place for settlement. Their agents sedulously endeavored to impress the belief on the English people, and on successive English Governments, that the island was hopelessly barren, and utterly worthless except as a fishing-station, and that its climate forbade any attempts at agriculture. The people, themselves, who visited the island, saw only the rocky sea-margin, and never penetrated the interior; and they, too, got impressed with the belief that the whole country was of the same character as the narrow strip on which they dried their fish. In this way it grew up to be a settled and almost universal belief that Newfoundland was worthless and irreclaimable, — a repulsive region, which could never be a home for civilized man.

FIRST SETTLERS.

But curiously enough, as years rolled on, in spite of all the efforts of the monopolists, people began to settle in the island. The attractions of the country were such that they set the laws at defiance; and, notwithstanding all the harsh treatment they received, they determined to make homes for themselves here. These sturdy settlers increased in numbers, fought out the battle of freedom against the monopo-

lists, and finally conquered them. England at last discovered her mistake, and repealed the obnoxious laws which prohibited settlement and the cultivation of the soil. But it was a long-drawn conflict, lasting for more than one hundred and fifty years. Only eighty-five years have elapsed since it became lawful to erect a dwelling-house, and enclose and cultivate a portion of land. It is necessary to mention these facts in order to account for the erroneous impressions regarding the soil and climate which have prevailed so extensively, and to explain how it is that the agricultural and other economic resources of the country are still so largely undeveloped. While in the neighboring provinces the British Government spent large sums of money in promoting colonization and aiding settlers, in Newfoundland settlement was sternly forbidden by law, and the cultivation of the soil was a penal offence.

FRENCH TREATY RIGHTS.

Even these did not constitute the only discouragements. By treaties with the French, the British Government gave them fishing-privileges along the whole western, northern, and a portion of the north-eastern shores of the island. Though no territorial rights were conveyed to the French by these treaties, yet the practical result was that the people of Newfoundland were excluded from nearly half the island, and this by far the best fitted for agricultural pursuits. They were cooped up chiefly around the shores of the peninsula of Avalon, where the soil is poorest. They were thus led to look solely to the sea for their subsistence, and became a race of fishermen, without any inclination or aptitude for other employments. Farming, lumbering, and mining never entered into their calculations. Knowing nothing of the interior, they imbibed the current belief that it was barren and worthless. How could it be otherwise, when the first road, nine miles in length, from St. John's to Portugal Cove, was not constructed till 1825, or only sixty years ago!

FIRST ATTEMPTS AT AGRICULTURE.

From the time when the first land grants were legalized, the settlers began to enclose and cultivate small patches of soil around their fishing-hamlets, wherever any was found fit for cultivation. Their experience proved that wherever judicious industry was expended on the land, even in spots which seemed peculiarly unpromising and difficult to clear, the soil yielded excellent returns. Those who were wise enough to combine fishing and farming became the most prosperous and independent of the working-classes. Year after year the cultivation of the soil extended, in the neighborhood of the various settlements sprinkled around the shores, and good crops were raised. The country around St. John's, though containing naturally almost the poorest soil in the island, was gradually covered with smiling farms and comfortable homesteads. Oats, barley, hay, potatoes, turnips, and other root crops were found to flourish luxuriantly. In 1874 the census showed that 36,000 acres were under cultivation, which, with the cattle, sheep, and horses, which the land sustained, were valued at $2,000,000. The annual produce was valued at $612,350. This extent of cultivation has, no doubt, considerably increased during the last ten years. And it must be remembered that this is the result of the limited effort made by the people, in this direction, around the various settlements, on the shore where the soil is poorest, and the harsh winds, blowing over the ocean, are most felt. The limited extent of land yet cultivated, in an island one-sixth larger than Ireland, having a temperate climate, and, as we shall see presently, immense tracts of fertile land, is sufficiently explained by the various circumstances already mentioned. What has been done in agriculture proves that, so far from the soil being intractable and barren, it yields, on cultivation, rich and abundant crops in great variety. The population of the island now approaches 200,000, and the greater part of all the food they require is still imported from the United States and Canada. Millions

of dollars are expended in the purchase of this food in the neighboring countries.

In 1880 the value of agricultural produce imported was $2,800,000. Were there an agricultural population settled on the fertile lands the greater part of all that is required for consumption could be raised on the island, where a profitable market would be found among those employed in gathering in the harvests of the sea.

To say nothing of lumbering and mining, an agricultural population, numbering hundreds of thousands, might find comfortable homes, and a profitable outlet for their industry, in those unoccupied fertile lands. In mines and forests many thousands more might find remunerative employment were these natural resources developed.

That these are not mere random assertions or exaggerated statements will be abundantly evident from the various authorities which will be quoted in these pages, and the array of facts by which these conclusions will be sustained.

The principal evidence which will be submitted on this subject will be derived from the reports of the geological survey of the island, and from the reports of the various Government surveyors who, for some years, have been engaged in surveying and mapping the crown lands.

THE GEOLOGICAL SURVEY.

The geological survey was commenced in 1864, under the direction of Sir William Logan. He selected Alexander Murray, F.G.S., who had been for twenty years his colleague in conducting the geological survey of Canada, to take charge of the survey of this island. It is needless to say that Mr. Murray's wide experience and high reputation as one of the foremost geologists of the day amply justified the selection. For nearly eighteen years he prosecuted the work, having had for a good portion of that time the able assistance of Mr. James P. Howley.

ANNUAL REPORTS.

The results of their joint labors were embodied in annual reports which have been reprinted in a single volume entitled, "Geological Survey of Newfoundland. By Alexander Murray, C.M.G., F.G.S., Director, and James P. Howley, F.G.S., Assistant. London: Edward Sandford. 1881."

It contains a valuable record of a survey which has completely banished the old delusions regarding the barrenness of the soil and the poverty of the natural resources of the island. Newfoundland now stands before the world as a country having very great agricultural resources which only require the strong arm of labor for their development. Not only so, but its forest wealth is shown to be great, and its mineral deposits of immense value. Scientific explorers of the highest character have put all these facts beyond doubt. Representations, founded on ignorance and prejudice, which had so long retarded colonization and progress, have been completely disproved; and it can no longer be disputed that the natural resources of the island are of a very high character, requiring only capital, skill, and labor to develop them into great and important industries.

BARREN REGIONS.

Of course, in making such statements, it is not at all meant to convey the impression that the whole island possesses a productive soil, or even that the greater part of it is a region of fertility. On the contrary, there are wide tracts irreclaimably barren, such as the southern portion between the head-waters of the Exploits River and the sea, which is a dreary waste, almost entirely devoid of vegetation, and for months each year enveloped in fogs, more or less, — a cold, gloomy, unattractive region. There are other large tracts covered with boulders. It is also true that there are extensive areas in the peninsula of Avalon, in the great central plateau, and also in the great northern peninsula, the surface of which is covered with marshes, and what are called by the people,

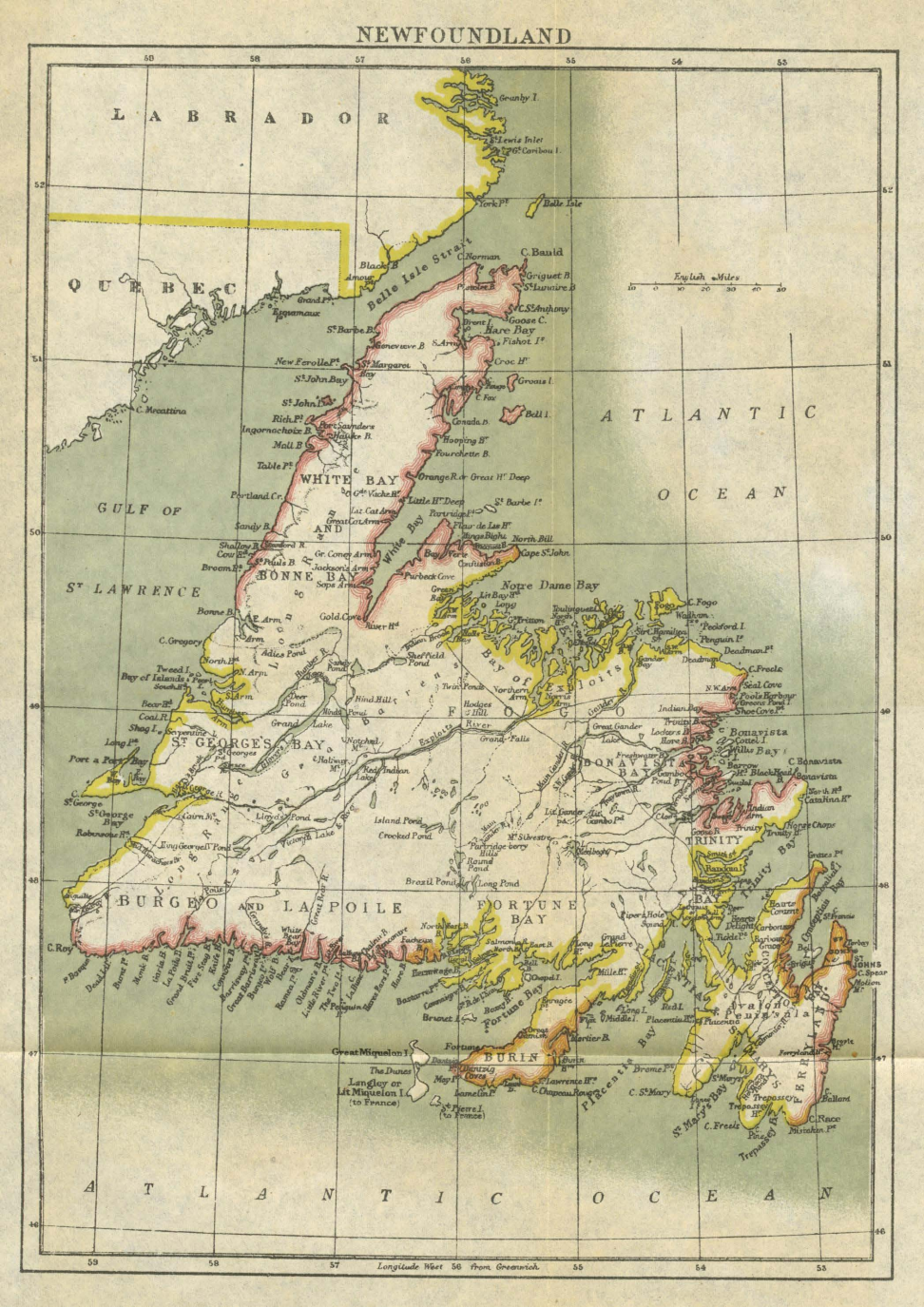
not inappropriately, "barrens." So numerous are the ponds and lakes that fully a third of the surface of the whole island is occupied by them. But, just as in Canada and the United States, there are fertile belts in various localities, which, when united, present an immense area of agricultural lands. These fertile tracts are found mainly in the valleys through which the principal rivers run, and around the heads of the great bays which penetrate the land deeply. Nearly all the valleys are well wooded, and all abound with level and fertile tracts, often of immense extent.

Here it is that an agricultural population will find abundant room, and farming is likely to become a great and important industry. In the same valleys are the great forest-growths of the island.

The mineral lands, which for the most part present a barren, repulsive appearance on the surface, are found in broken, hilly regions, where the formations have been greatly disturbed by upheavals and depressions.

OBJECT OF THE HAND-BOOK.

It is the object of these pages to point out the position, extent, and character of these fertile belts, as ascertained by the geological and other surveys, so as to enable those who are disposed to invest their capital in lands suited for settlement, to discover the most desirable localities, and also to aid those who may be desirous of settling on the unoccupied lands, as farmers, in finding such a soil as may repay their industrious efforts. The forests and mineral lands, as well as the other economic resources of the country, will also receive due attention.


NEWFOUNDLAND
LABRADOR
QUEBEC
ATLANTIC OCEAN
GULF OF ST LAWRENCE
ATLANTIC OCEAN
Belle Isle Strait
WHITE BAY
BONNE BAY
St GEORGE'S BAY
BURGEO AND LA POILE
FORTUNE BAY
BONAVISTA BAY
TRINITY BAY
Notre Dame Bay
Bay of Exploits
Bay of Islands
White Bay
English Miles
Longitude West 58 from Greenwich.

HAND-BOOK

OF THE

RESOURCES OF NEWFOUNDLAND.

CHAPTER I.

GENERAL SURVEY OF THE AGRICULTURAL LANDS.

GOOD LANDS.

THERE are three great rivers in the island, —the Exploits, the Humber, and the Gander; and it is in the valleys through which they and their tributaries flow that the largest areas of fertile land are to be found. But along the valleys through which the smaller streams run good land, of greater or less extent, is also found, sometimes of considerable extent and great fertility. The same holds good regarding the heads of the bays, where level tracts of good soil are found of variable extent.

EXPLOITS RIVER AND VALLEY.

The largest of the three main arteries is the River Exploits. "It rises," says Mr. Murray, "in the extreme south-western angle of the island, and within twelve miles of the southern coast, near La Poile, and flowing in a north-easterly direction, terminates in the Bay of Exploits, Notre Dame Bay. The distances from the sources to the outlet measure very nearly 200 miles in an air-line. The upper waters flow in

two minor branches, the Exploits proper and the Victoria branch, of about equal size, both of which empty into Red Indian Lake, which itself is upwards of 36 miles long, with an average width of about two miles, and very deep; whence flows the main stream for 72 miles to the sea. The normal surface of Red Indian Lake is 468 feet above the sea, and its total area is 69 square miles. There are numerous tributaries to this great river, some of which might with justice be termed rivers themselves; and the whole area drained by the Exploits valley is nothing under 3,000 square miles."

We shall presently see what proportion of this great valley is available for settlement, and what is the character of its forest-growth.

HUMBER RIVER AND VALLEY.

The next largest river is the Humber, falling into the Humber arm of the Bay of Islands, after draining an area of 2,000 square miles. The main branch of the Humber rises about 20 miles inland from Bonne Bay, and, after a circuitous course, falls into Deer Lake. The other branch rises north of Sandy Lake and flows through it into Grand Lake; thence, by Junction Brook, it joins the main branch, six miles above Deer Lake. From this lake, which is 16 miles long, the Humber flows majestically into the Bay of Islands. The scenery of the Humber is among the grandest in the island. The agricultural lands and the forests of this large valley will be described in their proper place.

GANDER RIVER AND VALLEY.

The Gander is the third of the large rivers of the island, and drains an area of 2,500 square miles, falling into Gander Bay. Its principal branch rises near Bay D'Espoir, on the southern coast, and running north-easterly, falls into the great Gander Lake. The other, after a winding course, falls into the same lake, whence the united stream runs northerly for 31 miles into Gander Bay. Gander Lake is 33 miles long, and has an area of 44 square miles.

SEATS OF FUTURE AGRICULTURAL SETTLEMENTS.

These, then, are the three main arteries of the island; and in their valleys are found the largest and best stretches of fertile land. These are destined to be the great seats of agricultural colonies. But the smaller rivers also present considerable areas of good land along their banks. Terra Nova River is a considerable stream, noted for its rapids, falling into Bonavista Bay. The Gambo also discharges here. Colinet and Rocky rivers fall into St. Mary's Bay. The Codroy River rises in the Long Range of mountains, and flows through a valley containing the finest land in the island. The rivers discharging their waters on the southern coast have short courses, and, for the most part, rush in turbulent torrents to the sea. The principal of these are Bay D'East River, Bay De North River, Little River, White Bear River, and La Poile River. The rivers and brooks which discharge on the south side of St. George's Bay interlock with the tributaries of the Exploits, taking their origin among the mountains of the Long Range; after leaving which they flow in a westerly course, through a wide expanse of level country, to the sea. Along these valleys opening out along the shores of St. George's Bay are some of the finest and most desirable agricultural lands, capable of sustaining a large population, if duly cultivated.

EXTENT OF FERTILE LANDS.

Before going into details, it may be desirable to present a general outline of the extent of agricultural lands contained in these valleys. Mr. Murray, the geological surveyor, states in his reports that the regions near and surrounding St. George's Bay, including the Codroy valleys and Port-a-Port, contain 730 square miles, more or less suitable for settlement, "the most favored tract being the coal-measure districts, where the surface is often flat or gently undulating over a great many acres." Bay of Islands, including the valley of the Humber, Deer Lake, and Grand Lake country,

contains 600 square miles suitable for settlement, — being a total of 1,330 square miles in this single district of land "perfectly capable of being reclaimed, and converted into fairly productive grazing and arable land." "These valleys," says the report, "are well wooded, producing, in many instances, large pines, juniper, or tamarack (the latter a species of larch), fine yellow-birch, and other valuable timber. In the valley of the Humber this is especially the case, where a large area of country appears to be provided with all the necessary material for ship-building in a remarkable degree."

LAND IN THE GANDER COUNTRY.

Passing now to the Gander country, on the eastern coast, — on the Gander River and Lake, with the tributaries, and including the Gambo and Terra Nova valleys, together with the tracts at the heads of the bays, there are, according to Mr. Murray, 1,700 square miles available for settlement. The Exploits valley and Red Indian Lake, together with the lands surrounding the estuary of the Exploits, contain 1,620 square miles. Thus we have a total, in these great valleys alone, of 4,650 square miles, or 2,976,000 acres, fit for settlement, and capable of sustaining a very large population.

SMALLER TRACTS OF GOOD SOIL.

It must be observed that the foregoing comprise only the more extensive tracts of fertile land at present known. In addition, however, there are many smaller portions of excellent soil around the heads of all the bays, along the margins of the smaller rivers, and on several of the islands, such as Random Island, Trinity Bay. These when united form no inconsiderable area. The Salmonier Arm and River may be named as a district where there is a very considerable extent of good soil, but little of which is yet under cultivation. The peninsula of St. Mary's, the north side of Smith's Sound, in Trinity Bay, Goose Bay, in Bonavista Bay, are also fertile districts. Along the railway track,

between Holyrood and Harbor Grace, surveyors have been at work for some time laying off the lands in townships. Here, too, at intervals, small areas of good land are found, on which a considerable number of farms may be cultivated, having the great advantage of proximity to the railway. When we add to these the land already under culture around the various settlements, and the immense tracts of land throughout the peninsula of Avalon which are admirably adapted for cattle and sheep raising, the area of the whole can scarcely be under 2,000,000 acres. Thus we have close on 5,000,000 of acres which are known to be well adapted to agricultural or grazing purposes. The more carefully the surface of the country is explored, the more numerous are found to be the reclaimable portions which industry could convert into productive farms or valuable cattle runs.

MR. MURRAY'S OPINION OF THE SOIL AND FORESTS.

Such being the agricultural capabilities of the island, it is not surprising to find the geological surveyor, Mr. Murray, using the following words: "In round numbers the total population is about 200,000 souls, supported almost altogether in provisions by the Dominion of Canada and the United States. While I have no hesitation in affirming that, were the island treated like any of the maritime provinces of the Dominion, where mining, lumbering, and agriculture are duly encouraged, the time need not be far distant when the numbers of the inhabitants might be reckoned by tens or hundreds of thousands, and eventually by millions."

JOINT COMMITTEE'S OPINION.

To the same effect we may cite a report of a Joint Committee of the Council and House of Assembly, made in 1880: "Our agricultural industry, though prosecuted to a valuable extent, is yet susceptible of very enlarged development. Vast stretches of agricultural land, extending from Trinity Bay, north, along the heads of Bonavista Bay, Gander Bay,

and Exploits River, as well as on the west coast, need only the employment of well-directed labor to convert them into means of independent support for thousands of the population. . . . The inquiry is further suggested whether this colony should not become an exporter of live stock; and we have little difficulty in affirming this position. For grazing purposes we have large tracts that we believe cannot be surpassed in British North America; and when we regard our proximity to England, and the all-important consideration of a short voyage for live stock, the advantages we possess in this connection are too manifest to be the subject of question or argument."

CHAPTER II.

THE WEST COAST AS AN AGRICULTURAL REGION. — CODROY VALLEYS. — ST. GEORGE'S BAY. — BAY OF ISLANDS.

HAVING thus obtained some general idea of the extent and position of the agricultural lands, it becomes necessary to go more into detail, and furnish some account of the characteristics and capabilities of each district separately.

THE WEST COAST AS AN AGRICULTURAL REGION.

We begin with the west coast of the island, because, in an agricultural point of view, it is by far the most important, having, in addition to a large extent of fertile soil, valuable forests, coal-fields, marble, gypsum, and limestone beds, while the climate is by many degrees superior to that of the eastern and southern shores. There is also reason to believe that it contains valuable mineral deposits. Here is a wide field for settlers, in which farming and cattle and sheep raising could be carried on upon an extensive scale.

The superiority of its soil arises from the fact that a large portion of it belongs to the carboniferous formation, which is not found to be developed in any other part of the island. The superiority of its climate is caused by the fact that it is out of the range of the fogs which so often envelop the south and south-eastern coasts, to which they are largely confined; and also because the cold easterly winds, blowing over the Atlantic, are modified before reaching the west coast. On these accounts this part of the island seems destined to become, in the near future, the seat of a large agricultural industry; while on the east coast the great valleys of the Gander and Exploits will witness a similar development in farming and lumbering.

THE CODROY VALLEYS.

CODROY RIVERS.

A glance at the map shows us that the Great and Little Codroy rivers, which have but short courses, fall into the sea about 16 miles north of Cape Ray, and six miles south-easterly from Cape Anguille. Their mouths are but a few miles apart. The valley which they drain, though of no great extent comparatively, is one of the finest agricultural districts in the island. It is bounded on the south-east by the Cape Ray mountains, rising, rugged and barren, to a height of 2,000 feet. The Cape Anguille range forms its northern boundary; and these, says Mr. Murray, present a soft and gentle outline, while the higher elevations attain an altitude of 1,000 to 1,300 feet, richly covered by forest trees nearly to the summits."

CODROY VALLEY.

The lower part of this valley, between the two ranges of hills, gives an expanse of low, flat land, the breadth of the valley being about 12 miles. In the upper part of the valley the hill-ranges converge towards each other, and "the valley gradually becomes more and more contracted in width until shut in nearly altogether, where the main stream at the end of the survey becomes split up, among the mountains of the Long range, into a succession of small turbulent mountain brooks."

SURVEYOR-GENERAL'S OPINION.

More than thirty years ago, when this valley was almost uninhabited, the Surveyor-General who then held office visited Codroy, and in his report gave the following account of the region: "The extent of land between the Great and Little Codroy rivers, and on the north side of the former, may, from the examination made, be estimated to contain an area equal to 70,000 acres. The whole of that space consists of a rich loam, capable of the highest degree of culti-

vation, and fit for the production of any description of crop. Limestone is readily obtained, and can with little trouble be made to contribute to the support of the land where it is so abundantly found. Timber of the most serviceable description covers, for the most part, the tract here referred to. Birch trees, measuring from five to seven feet in circumference, were found within a quarter of a mile of the shore, while others of a larger growth may be readily procured at a short distance from it. Among the birch are mingled spruce and fir of all sizes, suitable either for the erection of houses or the construction of vessels. From information obtained at Codroy, little doubt exists that coal may be procured, and that without much difficulty, toward the eastern end of the river. Lying to the northward of the valuable tract of land referred to is found a range of hilly ground, admirably adapted for grazing, its natural productions consisting of herbage, which, early in the summer, attains a height of between two and three feet. . . . In closing the remarks on this river it is doing no more than justice to say that it would be difficult to imagine a more beautiful or picturesque scene than the whole presents; and whether with reference to the soil around it, to its fisheries, or to its geographical situation, forming, as it does, part of the Northern Head, and therefore commanding the entrance to the Gulf of St. Lawrence, a more desirable or important place for a settlement could scarcely be found."

MR. MURRAY ON CODROY.

Mr. Murray, in carrying out the geological survey, visited Codroy in 1866, and his report in regard to the soil fully sustained that of the authority just cited. He says: "The area occupied by level or gently undulating land in the valley amounts, by rough measurement on the plan, to about 75 square miles, or 48,000 square acres, a very large proportion of which is available for settlement. For the most part the country is well wooded with stout mixed timber, consisting chiefly of spruce, balsam firs, yellow birch, frequently of

large size, white birch, and tamarack; but there are also frequent spots of barren or spongy marsh, entirely void of timber, or only maintaining a very stunted growth of evergreens, or small tamarack bushes. The islands and flats of the lower part of the Great Codroy River yield a luxuriant growth of wild grass, affording an ample supply of admirable fodder for cattle. Along the sea-coast, between Trainvain Brook and the little village of Codroy, the country is partially settled all the way, the attention of the settlers being about equally divided between the cultivation of the land and fishing operations; but up the Great Codroy River, which is more or less occupied on either side of the estuary, the calling of the inhabitants appears to be more purely agricultural, and it may be fairly stated that, notwithstanding the very rude process by which the land is cultivated, the crops produced, of grass, grain, and roots, highly testify to the excellence of the soil in which they are grown. Cattle and sheep are raised upon most of these small farms, producing most excellent beef and mutton, besides dairy produce of the very best description.

"The greater part of the Anguille, and some portions of the lower slopes of the Cape Ray range, also are capable of improvement, and if cleared of timber and sown in grass, would afford grazing land not easily surpassed in any country."

MR. HOWLEY'S SURVEY OF CODROY.

In the year 1883 Mr. James P. Howley, Assistant Geological Surveyor, spent the summer months in making a complete topographical survey of these valleys. He triangulated the region, and blocked off the lands into townships, so that grants can now be issued to all applicants. In his report he says: "The number of farm lots in actual possession on the coast-line and shores of the estuary of Grand River, located and laid off, was 93 in all; having an average of 163 a. 1 r. 38 p., or a total of 15,204 a. 3 r. 18 p. A further amount of 2,121 a. 1 r. has been applied for or otherwise claimed on the Grand River. On the Little River estuary and coast

southward about 8,960 acres are occupied or held in posses sion. As yet only twelve applications for the latter district have been made. There are 27 vacant lots between the two rivers, and on the outer coast, having an acreage of 3,530 a. 0 r. 28 p., or an average of 130 a. 2 r. 39 p.

"The upper and unoccupied portion of the Codroy valley was estimated to contain a total area of about 42¼ square miles, or 27,040 acres. About one-third of this area is occupied by extensive barrens and marshes, while probably one-quarter of the remainder is covered by inferior soil, and a small stunted growth of timber. This would reduce the available agricultural land in the upper valley to about 13,421 acres.

"From the foregoing figures it will be seen that the total area of the valley of the Codroys is as follows:—

	A.	R.	P.
Area occupied on the estuary of the Grand River and coast outside	15,204	3	18
Area claimed on the estuary of the Grand River and coast outside	2,121	1	0
Area occupied on estuary of Little River and coast southward	8,966	0	0
Vacant lots between rivers . . .	3,530	0	28
Vacant lots on Upper valley . . .	27,040	0	0
Total	56,862	1	6

"The general character of the country has been so fully and faithfully described in Mr. Murray's report for 1866 that nothing can be added thereto. Though his survey of that year was undertaken for purely geological purposes, and did not present the same opportunities for acquiring a thorough knowledge of the whole region as ours of the past season, nevertheless his estimates are very nearly correct."

MR. HOWLEY'S PLAN OF SETTLEMENT.

Mr. Howley suggests that a further subdivision of the still available land in the valley be made, and that each lot

should be numbered, and either sold to intending settlers at an upset price per acre, or be regulated according to the position and character of the lot; or that otherwise grants in fee for fifty acres, with a right of preëmption over the remaining fifty, be given every actual settler upon the performance of certain conditions within a stated period. The terms, he thinks, should be made easy, and payment taken in kind, so as to facilitate the settlement of the land by poor but industrious persons.

CONDITION OF CODROY SETTLERS.

Regarding the condition of the present settlers, Mr. Howley says that "of late years much has been done towards improving their condition. The best possible return has been given for the small annual outlay on roads; but the non-completion of the main line to Port-au-Basque is still a great detriment to the advancement of the settlement. It is very much to be regretted that some means cannot be devised whereby this line could be completed with as little delay as possible, and its extension to St. George's Bay vigorously pushed forward. The completion of such a line of road would open up an immense tract of the best land in the island for settlement, and I feel confident that the effect which would be produced in the course of a short time upon our markets here, and along the whole southern coast of the island, would be of a highly beneficial character."

MONSIGNOR SEARS ON CODROY.

It may be interesting to quote the opinions of others, in addition to those already cited, in regard to this valley. The late Very Rev. Monsignor Sears, an ecclesiastic of high character, who spent many years in Codroy, and was the pioneer of civilization both there and in St. George's Bay, says: "As you ask in particular for the Codroy River, suffice it here to say that the range of good land along its banks is sufficiently broad for all purposes of forming good farms. The 'interval' is from a mile to two miles in width.

The valley of the Codroy is in most places computed at from ten to twelve miles wide, mostly composed of excellent land. The length of the valley is about forty miles. There are, of course, some marshes and some plots of stony ground, but nothing to impede farming operations on an extensive scale. In the 'interval,' and even the major part of the good upland, there are scarcely any stones. The wood is abundant and of excellent quality. The birch, which is plentiful, is an excellent article of fuel, besides its well-known use for ship-building."

A FARMER'S OPINION OF CODROY.

An intelligent Prince Edward Island farmer, who a few years ago spent a winter in this valley, on his return home gave an account of his experience in a local newspaper, from which the following is an extract: "You may judge of the richness of these Codroy lands by the fact that at the homestead where I passed the winter, a farm of not more than fifteen acres of roughly cultivated land, supported a stock of twenty head of cattle and thirty-five sheep wholly upon hay. Along the 'intervals' I passed over rich fields where clover had been grown luxuriantly for more than thirty years, without manure, and with no sign of decay or loss to the soil. Even the neighboring uplands seem equally inexhaustible in fertility, giving no sign of wearing out, though they have been cropped year after year, without manure, since they were settled. Indeed, the manure-heaps are considered an encumbrance by the farmers there. Observing large and unsightly heaps of stable manure, which had been accumulating for thirty years, as I was told, I asked one of the farmers why he did not turn the manure to account. He replied that their hay-fields had no need of manure, and as for their potato lands, any manure on them would choke the potatoes with clover. Indeed, these uplands are so rich that there seems no doubt that they are of volcanic origin."

A TRAVELLER ON CODROY.

A traveller from Cape Breton, who visited the region a short time ago, says: "The land is scarcely surpassed by any in the Lower Provinces for its fertility. We travelled about twenty-four miles above this beautiful and romantic river. There is a range of good upland extending some nine miles above the settlement. This is studded with birch, spruce, and fir. Then commences what is called 'the Big Interval.' This great tract of rich land I travelled for about fifteen miles either side of the river, some places extending over a mile in width. The extent and appearance of this splendid 'interval' struck me so forcibly that I stopped to examine carefully the nature of the soil. I could see along the banks that the soil was exceedingly good, and four feet in depth, while the grass, balsam, and balm of Gilead trees, and tall alders, gave proof of its surpassing fertility."

COAL IN CODROY.

Mr. Murray's reports show that Codroy possesses other resources besides its rich soil. "The coal rocks," he says, "were perceived to be distributed along the base of the Cape Ray mountains wherever visited from Trainvain Brook to the upper forks of the Great Codroy. . . . Gypsum abounds in the lower part of the carboniferous system, and is largely developed on the coast near Codroy and in Bay St. George. The vast masses which come out in the cliffs between Codroy Island and the Great Codroy River can hardly fail to prove, some day, of great value and importance. . . . Admirable building stone is found on Codroy Island and on the Great Codroy River." Limestone beds he also describes as "occurring on the coast near Codroy, and thence cropping out at intervals near the right bank of the Great Codroy River."

ST. GEORGE'S BAY.

PROSPECTS OF ST. GEORGE'S BAY.

There can be no doubt that St. George's Bay is destined to become one day the seat of a large agricultural, mining, and lumbering population. When we take into account the extensive tracts of fertile lands around its shores, the excellence of the timber, the coal-beds and mineral treasures, indications of which are abundant, and add to this the superior climate it enjoys, it seems every way likely that it will yet become the garden of Newfoundland. Towns and villages will yet dot its shores, and a prosperous population will occupy its valleys and hills.

ST. GEORGE'S BAY.

St. George's is a noble bay, — more properly it might be called a gulf, — being 40 miles wide at its entrance, and 50 miles in length. It is long and tapering, and receives at its head and along its southern shore numerous streams and rivers. A long low tongue of land runs out at the south side of the bay, forming an excellent harbor.

THE SURVEYOR-GENERAL ON BAY ST. GEORGE.

More than thirty years ago the Surveyor-General of the day, paid a professional visit to this region, for the purpose of reporting on its capabilities. In his report he said that it was capable of supporting more than 100,000 inhabitants in comfort. "The soil," he said, "is deep and rich, and when the trees and stumps are removed from it, no further obstacles exist to prevent the land being at once brought under the plough; while the husbandman has at hand limestone and gypsum sufficient for the most extensive farming operations, and in addition to which, kelp, a most valuable manure, may be collected to almost any extent, the clearing of the land would not cost more than 40 to 50 shillings an acre."

MR. MURRAY ON ST. GEORGE'S BAY.

In his report for 1873 Mr. Murray says: "The Long range mountains, which terminate in their southern course at Cape Ray, run in a north-easterly direction, and in a moderately straight line, towards the head of the Grand Lake, and on to the Humber River below Dear Lake; their north-western flank forming the boundary of the area to which the attention of the survey has been chiefly directed during the late season. The whole region, roughly estimated, contains an area of about 1,824 square statute miles, and may be thus subdivided: —

	Sq. Miles.
1. Area: South-east side of St. George's Bay, inclusive of the Codroy valleys . . .	816
2. Area: Country between the west coast and the Long Range mountains, south of the Bay of Islands to the north shore of St. George's Bay,	720
3. The Port-a-Port peninsula	288
	1,824

TOPOGRAPHY OF THE REGION.

"The main coast-line of St. George's Bay, between the Little Barachois in Flat Bay and Fishel's Brook, is for the greater part composed of abrupt banks of modern drift, rising to an elevation which varies at certain points from 100 feet to upwards of 180 feet in height. Farther south the drift-banks are interrupted by sections of the carboniferous rocks jutting out through them, still maintaining great uniformity of elevation; but south-westward of Crabb's Brook the rocks almost exclusively occupy the coast to Cape Anguille. Between this south-western part of the coast and the Great Codroy River the character of the country differs essentially from that farther to the north-east, in being mountainous, forming a range which derives its name from Cape Anguille at its western extremity. This range is shaped somewhat rudely to resemble an

isosceles triangle, the base of which is the coast between Cape Anguille and Codroy, while the apex reaches to a point midway between the coast and the Long range mountains, and within about three miles of the course of Crabb's Brook, where it is locally known as 'The Highlands' of St. George's Bay. The highest summits of the Cape Anguille range reach an elevation of 1,200 feet or more, and are in many parts abrupt, and even precipitous; but they materially differ in their contour and general aspect from the rugged masses of the Long Range, by being smoothly rounded in form, and carrying more or less vegetation to the highest parts. Innumerable small streams, which take their rise from lakes and lakelets among these mountains, pour their waters in picturesque cascades over the lofty cliffs which bound St. George's Bay; while many more flowing in the opposite direction join the waters of the Great Codroy River, or fall into the sea between its outlet and Codroy Island."

FORESTS OF ST. GEORGE'S BAY.

"North-eastward from the terminating point of the Cape Anguille mountains the whole country between the coast and the Long Range is of a flat or undulatory character, densely covered with forest trees, except in such parts as have been swept by fire, or occasional tracts of marsh. The trees of this forest consist of white and yellow birch, spruce, and balsam fir, poplar, and tamarack, or larch. There is, however, little or no pine. The only parts where that timber was observed to grow were on a few spots near the banks of the Flat Bay Brook, and an occasional spot in like manner in the valley of Fishel's Brook. Much of the timber of this great plateau is very large. Trees of yellow and white birch are frequently met with, and particularly on the river flats, having a diameter of three feet, and even more, many of which are tall and straight, resembling the hard-wood forest trees of Canada; spruces, balsams, poplars, and tamaracks also reach a maximum size, and seem to be of excel-

lent quality. The ground is often densely covered by a creeping bush, a species of yew, generally known as ground-hemlock in Canada, where it abounds; all amply testifying to the excellence of the soil upon which they grow."

RIVERS OF THE DISTRICT.

The rivers which drain this district are the Little Barachois and Flat Bay brooks, the Fishel, Robinson's, Middle Barachois, and Crabb's brooks. "All these streams," says Mr. Murray, "take their rise among the barren wastes of the Long range mountains, but the lower reaches of each, for distances varying from 12 to 20 miles, flow through richly wooded and fertile valleys intersecting the plateau just described. These valleys, and much of the higher lands, now primeval wilderness, appear to be, in nearly every respect, well adapted for agricultural settlement. By deducting the tract occupied by the Cape Anguille range of hills, amounting to 256 square miles, which is too high and too steep for ordinary tillage, although well suited as runs for sheep or cattle, the remainder of the block, viz., 560 square miles, is certainly to a large extent reclaimable, and there can be but little doubt that the construction of roads, which must necessarily be the consequence of occupation, together with the clearing of the forest, will lead to mineral discovery of vast importance to the colony.

"Water-power, for the purpose of driving machinery, could be obtained at almost any point desired; the low-lying flats offering every facility for building or mill sites."

SECOND AREA OF THE BAY.

Of the second geographical area named above, Mr. Murray says that a large portion of it is mountainous, but he adds: "Tracts of considerable extent upon the coast, and nearly all the valleys of the principal streams, bear a soil of the most fertile description, which is even already shown by the few and rudely cultivated spots here and there, where the productions in grass, green crops, and even cereals, are all

first class, both in quantity and quality. And this in a country where there is no evidence of the existence of a plough or harrow, or a wheeled vehicle of any kind whatever."

COUNTRY NORTH OF THE GRAVELS.

At no great distance from the coast north of the Gravels is a range of Silurian mountains averaging 900 to 1,000 feet in height. From these numerous streams flow. "Our time," says Mr. Murray, "would not permit us to make surveys of any of these rivers; but, from the evidences visible at their outlets, and such information as could be derived from the inhabitants, there can be little doubt that large tracts of extremely fine land extend up their valleys for many miles. The richness of the soil at this part of the coast is probably due to the calcareous material derived from the adjacent mountains, together with the disintegration of the trappean rocks of which the subsoil is composed. We were surprised to perceive that the little Fox Island lying out in the bay, which, as seen at a distance, was conceived to be a mere barren rock, was covered over three-fourths of its area with a soil of the richest description, and that the gardens of the two families of poor fishermen who inhabited it were producing crops of potatoes, peas, and hay, which, for luxuriance and vigorous growth, could hardly be surpassed, although the mode of culture was of the very rudest."

RIVIÈRE BLANCHE.

Of Rivière Blanche, a river falling into St. George's Bay, near Indian Head, Mr. Murray's report says: "This river was measured about six miles up its course. A block of rich flat land, supported on members of the carboniferous series, is shut in, as it were, by the Silurian mountains on the north and west, and by the Indian Head range on the east, which is chiefly drained by the Rivière Blanche and Romaine's or Kippen's Brook. The area of the block is between 30 and 40 square miles, or about 22,400 acres. The whole of this

area (excepting the small clearings at the mouths of the streams) is densely covered with forests of large and vigorous growth, with abundance of yellow birch, spruce, fir, and other trees, but scarcely any pine."

HARRY'S BROOK VALLEY.

"The valley of Harry's Brook, above the western fork, is rugged and barren for the greater part, and much of it hilly or mountainous. Below the junction of Spruce Brook patches of good land begin to appear, chiefly on the right bank; and back from the lower reaches on the same side there is a broad tract of very good country. The islands and low banks near the outlet are of the best soil for grass meadows. To the south-east of Spruce Brook nearly the whole country is spread over by vast marshes which extend up to the flanks of the hills on the south-west side of the Grand Lake."

PORT-A-PORT PENINSULA.

Of the Port-a-Port peninsula the report says much of it is high and hilly, but "there are numerous patches of very fine land, and particularly around the shores of Western Bay. . . As the mineral indications observed seemed to favor the probability of the peninsula becoming a mining district in course of time, these patches of available agricultural land can scarcely fail to become of great value."

ROOM FOR TWENTY THOUSAND SIX HUNDRED AND FORTY SETTLERS.

"The vast importance of these regions as an agricultural country, setting its probable mineral value aside altogether, may in some degree be understood by supposing the whole available area to be blocked off in lots of 100 acres each, and each lot to be occupied by one person; there would then be 3,584 settlers on the south-east side of St. George's Bay; 224 on the Rivière Blanche and Romaine's Brook block; and 320 at least upon all the remainder. If we further suppose

that each settler has a family of five members, there would then be a population of 20,640 souls." To this we may add the numbers which would find employment in fishing, lumbering, mining, and various trades, as well as in farming, and we can form some idea of the population the shores of this bay is capable of sustaining. At present there are but a few farms along the coast on either side of the bay.

MR. HOWLEY'S TOWNSHIP SURVEY OF SOUTH SIDE OF BAY ST. GEORGE.

In 1884 Mr. James P. Howley spent the summer months in laying off the large tract of land on the south side of St. George's Bay into townships of 36 square miles each. He was accompanied by a duly equipped surveying party. He included the whole of the available land here in nine townships.

REPORT OF SURVEYOR.

His report states the total area for the whole tract to be 330 square miles, or 211,200 square acres. Mr. Howley says: "Probably one-third of this great area would have to be deducted as unfit for settlement, owing to the prevalence of barren and marshy land, which would still leave 220 square miles, or 140,800 square acres available. The character of the soil spread over so extensive a surface is, of course, very diversified; fully one-half in four of the townships is occupied by extensive barrens and peat bogs of little value, except as runs for sheep and cattle. In the remaining townships the good land preponderates, and the soil in many places is of superior richness, especially in the vicinity of the large rivers, where much interval land occurs. The prevailing character is a deep red or yellowish sandy loam; but the alluvial interval deposits partake more of the character of a rich dark, sometimes nearly black, mould. The fertility of these latter soils is well attested in the quality of the timber they support. Yellow birch (witch-hazel), white birch, balsam poplar, maple, large spruce, and fir are the

prevailing varieties. But considerable tracts are frequently covered with a dense growth of large alders, intermixed with elder and white-wood, which are certain indications of a rich, moist, alluvial soil." The soil which covers the lower carboniferous formation is invariably good; and when the characteristic red of the sandstones and conglomerates of this formation is seen, soil well adapted to agricultural purposes may be looked for. This is the case in New Brunswick, Nova Scotia, and Cape Breton. Mr. Howley remarks: "The cause of the fertility of such soils is readily accounted for in this way: nine-tenths of the superficial deposits spread over any tract of country are composed of the *débris* of the rock formations immediately underlying them. When, as in the case of the lower carboniferous, the bulk of the formation is composed of soft sandstones, shales, clays, marls, limestones, and gypsum, an intermixture of these various ingredients must naturally result in soil of a superior character. On the contrary, where the underlying rocks are chiefly crystalline, silicious, or feldspathic, containing little or no lime, the resulting soils are usually poor and hungry, requiring a constant supply of fertilizing agents to render them at all productive. The question, then, of the superiority, or otherwise, of the soil over any tract of country, can at all times be determined upon geological grounds, when the rock-structure of the country is known."

COAL AREAS OF ST. GEORGE'S GYPSUM DEPOSITS.

In addition to this extent of good soil and valuable timber, St. George's Bay contains a coal-field which Mr. Jukes, the eminent geologist who visited it in 1840, estimated to be 25 miles wide and 10 miles in length. Seams of this coal have been found cropping out in two places,—on Robinson's Brook, and on the Little Barachois River. Further account of it is reserved for the chapter on the mineral wealth of the island. Of other economic resources, Mr. Howley says in the report already quoted: "The immense gypsum deposits, so frequently met with throughout this region, cannot fail to become of

considerable economic importance in the future, especially as much of it partakes of the character known as alabaster. Its value as a fertilizer, should the country become settled with an agricultural population, can hardly be over-estimated. Many substances of minor importance, such as building-stones, limestones, brick-clays, grindstones, whetstones, etc., occur in abundance. The Laurentian hills, in the rear, give promise of considerable deposits of iron ores, boulders, and fragments of which are found plentifully distributed along the beds of the principal streams. These and other less known resources, combined with the greatly superior quality of the soil, must in time render the district of St. George's Bay one of the most flourishing and prosperous in the island of Newfoundland."

MONSIGNOR SEARS ON ST. GEORGE'S.

The late Very Rev. Monsignor Sears, who labored incessantly for the improvement of this region and its inhabitants, says of the St. George's Bay: "As the soil here is surpassingly productive, especially in the growth of various grasses, I believe there is no country in our latitude to surpass it for grazing sheep or cattle. . . Wherever the trees are removed by fire, wind, or other causes, a spontaneous growth of grass springs up." He tells of meadows which he has known giving hay for the last nineteen years, "and the nineteenth crop is better than the first. . . The wood is abundant and of excellent quality, especially the birch, for fuel and ship-building. There is another tree here called the balm-tree. It grows so luxuriantly on the 'Long Interval' tracts of the river margins that, viewed from a distance, this fine-looking tree reminds one of the oak forests of the Old World, or the maple groves of the neighboring colonies. The timber is very light, something like that of the aspen, and is as soft to cut as the cedar. For inside work it combines the gloss or polish of hard-wood, with the facility of being worked or dressed peculiar to pine. It covers hundreds of acres, and grows to a size of three or four feet in diameter."

DR. BELL ON ST. GEORGE'S.

One more testimony regarding this region may be referred to, that of John Bell, M.A., M.D., who visited the west coast, and described it in the "Canadian Naturalist" for 1870. He says: "Along the river flats, in the valleys, and on the 'barrens,' when these are drained, and the country is a little more cleared, there will be room for thousands of farms, and the hills will afford walks for immense flocks of sheep, and pasture for countless herds of cattle, the surplus of all which will find a ready market at the ports and fishing-stations, at the lumbering, manufacturing, and mining establishments, which ere long will make this old and neglected colony one vast scene of active and profitable industry. The climate of the island is favorable to the development of its agricultural resources of every kind. Instead of the cold, foggy atmosphere which is generally supposed to hang over the island, quite the reverse is the case. The air is clear and warm, and the temperature during the year remarkably equable, the mercury in winter seldom falling below zero of Fahrenheit's scale, or in summer rising above eighty degrees, while the mean temperature of the year is about forty-four degrees. I never saw finer weather than during the two months I was on the island. It is only on the south-west corner that fogs prevail to any extent, from the proximity of that part to the Gulf Stream."

FISHERIES OF ST. GEORGE'S BAY.

In connection with the settlement of this region we must add the valuable fisheries of St. George's Bay, from which the present scanty population derive a good part of their sustenance. This bay is one of the great seats of the herring-fishery. Herrings are so abundant that every man takes as many as he thinks he can cure. Cod, salmon, and smelt are also abundant. All these resources combined point out St. George's Bay as the seat of a large population in the future.

MR. HOWLEY ON PORT-A-PORT.

The following extract from Mr. Howley's report for 1874 regarding the peninsula of Port-a-Port shows that its agricultural capabilities are far from despicable: "It was estimated that there may be in the peninsula alone nearly 100 square miles of area available for agricultural purposes. In the region surrounding West Bay, a tract extending over at least 45 square miles, is level, densely wooded, and is intersected by several brooks of good size. At some abandoned clearings near the sea-shore the rank luxuriance of the grass that grew there was most remarkable, while the timber produced over the other parts of the area was of good quality, consisting chiefly of white spruce, balsam, fir, and yellow birch (commonly known as witch-hazel). Pine was not observed, and, if it exists, is scarce.

"The valley of Benoit's Brook contains an area of about 60 square miles, at least one-half of which might be reclaimed; but there is a great deal of marshy ground over the remainder. The country is well timbered with the usual variety of trees.

"The whole area of the valley of Serpentine River is about 58 square miles. Much of these lower lands are of good soil, more especially on the banks of the river and along the base of the mountains, where the surface is generally level and dry. In addition to the usual varieties, pine and tamarack may be enumerated among the indigenous timber. These latter trees, although less abundant than the others, are nevertheless in considerable quantity, and some of the former reach a great size. I measured one pine which had a circumference of twelve feet, and there are many varying from two and one-half to three feet in diameter.

BAY OF ISLANDS.

CHARACTER OF THE REGION. — TOPOGRAPHY.

About 50 miles from the north head of St. George's Bay the Bay of Islands opens, being 15 miles wide at its entrance,

where it is studded with lofty islands. This fine region, only second in importance to Bay St. George in regard to its agricultural capabilities, its fisheries, and its mineral and timber wealth, contains as yet but few inhabitants, who are scattered along the banks of the Humber Sound and River. The bay is spacious and easy of access, its depth being about 15 miles, and the anchorage safe and good on the southern side. There are several arms extending from the eastern side; but the most important is that known as the Humber Sound, extending from the south-eastern part of the bay about 28 miles easterly into the country, with a width of more than two miles. At its head is the mouth of the Humber River, the second largest river in the island. A range of hills, called the Blow-me-down Hills, from 800 to 1,000 feet high, rises to the south of the Sound. On approaching the Humber their height and abruptness gradually level down until, on the banks of this fine river, they do not rise higher than 300 feet, while they present to the eye a rich clothing of the most varied foliage, which goes down to the water's edge. This, however, does not hold good on the first or lower course of the river, which passes through a narrow gorge, nearly three miles in length, having on each side lofty crags, which in some places shoot up perpendicularly from the water's edge to the height of 1,000 feet. In flowing through this gorge the river is in some places pent up to less than a chain in width, the current being deep and strong. Three miles from the mouth of the river a slight rapid is met which is easily passed at high spring-tides. Above this rapid the Humber opens out wide, flowing through a beautiful and picturesque valley from three to seven miles in width, with fine flat land on either side. Within a mile of the lower end of Deer Lake, which is 12 miles from the mouth of the river, a second rapid is met, considerably stronger than the first, over which a boat can be readily taken by tracking, and which presents but a slight impediment to the safe transit of rafts of timber from the lake to

the Sound. The rise from the sea to the level of Deer Lake Mr. Murray found to be only 10 feet.

Deer Lake, through which the Humber flows, is 15 miles in length and 3 in breadth. Around it, especially to the eastward and northward, is a fine expanse of flat, rolling country, reaching away in the former direction towards Grand Lake. "The land surrounding Deer Lake," says the report of the Surveyor-General already quoted, "is of the most fertile description, bearing on its surface pines measuring from three to four feet in diameter, with birch of hardly inferior dimensions, and both these kinds existing in great quantities, and with such water-power within reach as would seem to invite the establishment of saw-mills, and, at the same time, to insure success to such an enterprise." These remarks, it must be observed, describe the region as it was thirty years ago. Much of the timber referred to has been cut down long since.

COUNTRY ABOVE DEER LAKE.

In his report for 1866 Mr. Murray says: "Above Deer Lake the flat country is of great breadth, more particularly above the forks; the mountain range which bounds it on the west side pointing in the direction of Adie's Pond at the head of the river on one hand, while on the other it extends to the base of the low-wooded range west of Sandy Pond; and this level tract extends upwards on the river's course to the western bend, which is said to be less than ten miles distant from the head of White Bay. By a rough measurement of this large tract of country made upon the plan, there would be an area of about 429 square miles, or 274,560 square acres, at least one-half of which is probably well adapted for raising almost every kind of agricultural produce."

TIMBER AND OTHER RESOURCES.

"Independently of its agricultural capabilities this fine tract of country seems to present inducements for other

branches of industry and enterprise, in the quality of the timber, much of which is excellent. Tamarack, or juniper, is not rare; yellow birch, of large dimensions, is abundant; white-pine and spruce grow in the greatest profusion, frequently of a size and quality not greatly inferior, if not equal, to the best that is now largely brought into market in Gaspé, and other parts of the lower province of Canada. The natural facilities this part of the island presents for communication from shore to shore are also very great; the valley is easily accessible by water from the Bay of Islands to the Grand Lake forks; while the country farther north is well adapted for laying out roads, and a road of less than ten miles from the northern bend would open up the whole from the head of White Bay."

WATER-POWER.

"Water-power to drive machinery is everywhere obtainable, either in the main river, on the upper part of the stream, or in the numerous brooks that fall into Deer Lake and the lower reaches."

COMPARISON WITH CANADA.

"Thousands of square miles of country have been laid out in townships, and already partially settled, in Canada, either for purposes of lumbering or farming, on the northern shores of Lake Huron and many parts of the lower province, far inferior, in most respects, to this region of Newfoundland, which there can scarcely be a doubt is capable of supporting a very large population."

RESOURCES OF THE HUMBER DISTRICT.

The River Humber is about 114 miles in length; and there cannot be a doubt that the fertile tract of country through which it flows will one day be converted into a fine agricultural and grazing region. The difficulties presented to the navigation of the Humber, by the rapids already referred to, could be easily overcome were the country once settled;

and if this were done vessels and steamers of considerable size could reach Deer Lake. All visitors to the Humber district speak highly of its resources. The soil is deep and fertile, and capable of yielding excellent crops of all kinds. Limestone is easily procured, and to any extent, for agricultural purposes. It contains some of the finest timber in the island, which will be more minutely referred to when the forests come to be noticed. Marbles of all kinds occur on the shores of the Bay of Islands; and evidences of the existence of coal seams have been discovered in the neighborhood of Grand Lake. Even these do not constitute the whole resources of the district. The Bay of Islands is the seat of one of the finest herring-fisheries to be met with, the quality of the herrings being equal to that of those taken on Labrador. This fishery is prosecuted during the winter months, when the herrings are taken in immense quantities by cutting holes in the ice. Cod and salmon are also abundant.

BONNE BAY.

North of the Bay of Islands another fine bay opens, named Bonne Bay, the scenery of which is very fine. It has not yet been surveyed, and is but partially known. Casual visitors report a large extent of good land, especially suitable for grazing purposes, but also yielding good crops on cultivation. Here also there is a fine herring-fishery, and on that, with cod and salmon, the inhabitants chiefly subsist.

In regard to the more northern bays little is known; but casual visitors concur in declaring that at the heads of all these western and northern bays there are large stretches of good land, well adapted for settlement, and possessing natural advantages of great value.

CLIMATE OF THE WEST COAST. — ADVANTAGES PRESENTED.

The climate of Western Newfoundland is greatly superior to that of the eastern shores, being free from fog and from

the influence of easterly winds. In the regions already described — Codroy, Bay St. George, Port-a-Port, Bay of Islands, and the Humber district — there is an immense extent of good land awaiting the axe, the plough, and the spade. The climate is highly favorable to health and industrial occupations of all kinds.. The character of the district is such that a variety of occupations can be followed by settlers, — farming, lumbering, mining, ship-building, fishing, etc. The difficulties to be encountered here are far fewer than those encountered by the hosts of emigrants who pass by these shores and travel thousands of miles to the prairies and forests of the far West.

THE COUNTRY BETWEEN THE HUMBER AND NOTRE DAME BAY ON THE EASTERN COAST.

GREAT PLAIN ACROSS THE ISLAND.

From the Bay of Islands on the western coast to the shores of Notre Dame Bay on the eastern coast a level plain extends across the whole island, the greatest height of land not exceeding 130 feet. This plain presents admirable facilities for establishing intercourse, by road or railway construction, between the Humber district, with its fertile soil and valuable timber, and the mining regions around the shores of Notre Dame Bay. There is a fine stretch of country between these two points, the land being in many places excellent and of considerable extent, the timber abundant and of large size, and the mineral indications at several points of a very promising character. From 5,000 to 10,000 people could find comfortable homes along this great plain. A chain of small lakes, with rivers flowing from them, extends from Hall's Bay to the shores of Grand Lake, with only one portage a mile wide. By following these rivers and lakes a journey across is greatly facilitated. From Grand Lake the route lies across a portage of nine miles in width, and then the Humber River is reached, flowing through Deer Lake into Humber Sound. The scenery along this route, especially at the Birchy Ponds, is very beautiful, and for picturesqueness will

compare favorably, at several places, with the lake country of England or Scotland. Game of various kinds is abundant, and deer, at the proper season, are met with in large numbers.

ROAD SURVEY. — C. J. HARVEY.

In 1878 Mr. C. J. Harvey, civil engineer, was sent to survey a road through this valley from east to west. His report, which was printed in the Journal of the House of Assembly for 1879, contains some very interesting information regarding the character of the region traversed, in regard to its soil, timber, and mineral indications. The terminus of his road, which started from the head of the South-west Arm of Green Bay, Notre Dame Bay, was on the shore of Humber Sound, Bay of Islands. The total length was 99 miles.

EASTERN SECTION OF ROAD.

The eastern section of the road includes the country from south-west arm to the water-shed between Indian Brook and Birchy Ponds, the distance being 25 miles. The height of this water-shed above sea-level was found to be 85 feet, or an average of 3.4 feet to the mile, — a proof of the facility of road-construction, the grades being very easy. Of the resources of this section, Mr. Harvey's report says: "There is a very fair extent of land available for farming purposes at the head of South-west Arm and at South Brook. The land in the valley from South-west Arm to Indian Brook, in many places, is of an excellent character, having a good soil and tolerably large timber. There are several marshes, which are not deep, having a solid bottom at the depth of two or three feet, and these, if drained, would make very good meadow land. On both sides of Shoal Pond the soil is a rich sandy loam. From the west end of Shoal Pond along the line there is a soft, wet marsh for a distance of a little over a quarter of a mile. Then good dry soil is reached which extends to Indian Brook. The timber is principally

such varieties as white and black spruce, Canada balsam, white birch, juniper or tamarack, and white pine. The pines are rather scattered, but are pretty numerous on the ridge on the north side of Shoal Pond. Although this part of the eastern section cannot be called a good country for lumbering operations, yet it contains a very large amount of timber, available for coopers, farmers, and ship-builders. The size of the timber varies from six inches to two feet in diameter."

INDIAN BROOK VALLEY.

"The soil of the portion of Indian Brook Valley over which the line passes is really very rich as far as a point about 19 miles from South-west Arm. It then changes its character and becomes poor and rocky. As for the portion of the valley from Indian Pond east to Hall's Bay, I only passed through it on my way back to St. John's, and cannot speak so confidently of its character. But I saw enough to convince me that there is a large extent of very fertile land in this section, and that there is still some good lumber left standing, although lumbering operations have been going on here for a long time, and fire has devastated the whole length of the valley from the water-shed, — distant 44 miles from the mouth of the brook. The soil is a rich sandy loam, very easily worked. Unfortunately the timber in Indian Brook Valley has all been burned, and, although left standing, it gives the country a desolate appearance. The area of land available for farming purposes in the valley cannot be less than 50 square miles, or 32,000 acres." This would give 80 acres each to 400 families. The report states the area of timber-bearing land at 100 square miles. The timber is principally white pine, white and black spruce, white birch, and var. The pines vary from one foot to three and a half feet in diameter at the butt. "There is still a considerable quantity of timber available for lumberers, and a very large quantity suitable for farmers and builders. . . . The great advantage of the Eastern Section is its proximity to the min-

ing regions of Green Bay." A large population will one day find employment in the mines, and thus a ready market would be found for any produce that might be raised on the lands in the Eastern Section.

MINERALS OF THE REGION.

"There is a probability that copper may be found in this Eastern Section. The chloritic slates, which are so rich in copper on the sea-coast, are found in several localities on this route, and traces of copper and iron pyrites were observable at a point about two miles in from the South-west Arm; also about four miles in, and at the east and west extremities of the Indian Ponds.

CENTRAL SECTION.

"The Central Section extends from the height of land between the waters flowing east and west as far as the crossing of the River Humber, a distance by the surveyed line of about 39½ miles.

"This section contains many tracts of good land, but they are so scattered and undefined in area that it is very difficult to form an approximate estimate even of the total extent of land available for agriculture. . . . From the crossing of Main Brook to the Humber River there are innumerable patches of good land, all covered with fair-sized timber. There are a great many marshes in this region, and these, if drained, could be converted into extensive meadows. . . . The Central Section may be looked upon as an extensive lumbering region. Along Birchy Ponds and Sandy Pond there is a great quantity of timber of good size and quality. The varieties are white pine, white birch, white and black spruce, var, and juniper. It may be mentioned that ash-trees grow on some portion of the river between Seal Pond and Sandy Pond. The pines are very numerous on the shores of Sandy Pond. . . . There is a very extensive growth of timber in the country between Main Brook and the Humber."

COAL.

"There is another important consideration about this district. In going from the crossings of Main Brook to that of the Humber River, the road would cross the broadest portion of what is shown in Murray's valuable geological map as the coal-bearing region of our island." Coal has been found in small seams on Coal Brook, which empties into Grand Lake. The largest seam was 17 inches in thickness.

WESTERN SECTION.

"The Western Section includes that portion of the Humber Valley below Seal Pool and along Deer Pond, and the Lower Humber down to the seaboard, at a place called Wild Cove, on the Humber Arm, a distance of 34 miles . . . From what I saw myself I am fully convinced that the Humber Valley, and the country in its vicinity, is extremely fertile, and contains a great quantity of valuable timber."

"I met a very intelligent Nova Scotian, named George Nichols, who has been living on the banks of the Humber for six years. His house is situated about a mile from the east end of Deer Pond. He has a few acres of land cleared near his house from which he raised all kinds of crops which grew remarkably well. The luxuriant vegetation of his garden I never saw surpassed except in Manitoba. He considered the soil in the Humber Valley superior to any he ever saw in Nova Scotia, and the climate warmer and more free from frosts which would injure plants. Since he has lived there he had no crops of any kind nipped by frosts. He considered the soil admirably adapted to raise cereals, viz., wheat, barley, oats, and even buckwheat."

EXTENT OF GOOD LAND.

"Enough has now been said to prove that the area of the Central and Western Sections includes very highly productive land, with excellent timber on it. The total extent in these two together cannot be much less than 250 square

miles, or 160,000 square acres of good agricultural land. This would make a grand total of 300 square miles, including the Eastern Section."

FACILITIES FOR A RAILWAY.

"A railway would decidedly be the most advantageous way of opening up the country and inducing people to settle in the interior . . . A narrow-gauge railway could be very cheaply built across the island, and would answer all the requirements very well.

"The climate of the west coast and of the interior is equal to that of any part of Canada, and superior to that of Manitoba."

CHAPTER III.

THE EAST COAST.

VALLEYS OF THE EXPLOITS, GANDER, AND GAMBO.

THERE now remain the two great fertile belts opening on the eastern side of the island to be described, namely, the Valley of the Exploits, and the Gander and Gambo country.

BAY OF EXPLOITS. — TOPOGRAPHY.

The Bay of Exploits forms a deep bight on the south coast of the great Bay of Notre Dame. It has numerous arms, the greatest being the inlet which leads to the entrance of the Exploits River. There are several islands in this arm, the principal being Thwart Island, on the eastern side. "The water," says Mr. Murray's report for 1871, "is deep, and there is no impediment to navigation for vessels of any size until reaching Peter's Arm, where there is a good anchorage . . . The entrance to the Exploits River is at Wigwam Point, in lat. 49° 5′ N., long. 55° 19′ W., nearly at the south-western extreme of the long arm already indicated. Immediately opposite this entrance is Norris Arm, stretching for about six miles a little north of east, with an average width rarely exceeding half a mile, at the head of which another considerable stream falls in from the eastward. Taking its rise near the south-western angle of the island, and within a moderate distance of St. George's Bay, this magnificent river, with its numerous tributaries, drains an area of nearly 4,000 square miles."

LOWER VALLEY OF EXPLOITS.

Except at the mouth of the river, and on the arm, where a few settlers are found, there are no inhabitants in all this great valley. The river flows through Red Indian Lake, 37

miles in length, and distant from the mouth of the river between 70 and 80 miles. The lower valley of the Exploits, between the lake and the sea, is capable of sustaining many thousands of inhabitants. "The soil," says Mr. Murray, "is equal to the best parts of Lower Canada, with little swamp, unencumbered with boulders, the hills wooded to their tops, and from two to five miles wide." The root-crops grown by the settlers — potatoes, turnips, parsnips, etc. — he pronounces "the finest he ever saw." The timber is in many places still abundant, consisting of pine, white birch, very large spruce, and tamarack. Lumbering operations are carried on here on a small scale, but might be largely increased. The river and its tributaries afford water-power to any extent. The facilities for stock-raising are unrivalled, while railways or common roads could be easily constructed, the valley being for the most part a dead level.

FALLS AND CHUTES ON RIVER.

"The ascent of the river by canoe or light boat although not difficult is tedious, as there are so many strong rapids to encounter, and several falls and chutes, over which portages have to be made. The first of these obstructions is at the Bishop's Fall, of 19 feet, above which, but particularly for six or seven miles above the junction of the Great Rattling Brook, the river is more or less rapid all the way to the Grand Falls. The Grand Falls consist of a succession of chutes (one of about 30 feet) and violent rapids, somewhat over a mile in length, and giving altogether, from bottom to top, a rise of 145 feet. At a short distance above the Grand Falls there is an abrupt chute, and above it the river continues to be rapid and turbulent, till reaching the smooth waters of a lake-like expansion at the mouth of Rushy Brook."

TRIBUTARIES OF THE EXPLOITS.

Below the Red Indian Lake eight considerable tributaries pour their waters into the Exploits, the largest being Great

Rattling Brook, Chute, Sandy, and Badger Brooks, while there are four large and important streams which discharge into the lake itself. The smaller tributaries are very numerous.

VALLEY OF THE EXPLOITS. — SOIL AND TIMBER.

"The main river valley from Red Indian Lake downwards is nearly for the whole distance a level or gently-undulating country, broken only by occasional abrupt hills or rocky eminences, and densely wooded for many miles back, from either bank of the stream. . . . The forests of the Exploits Valley consist of pine, spruce, balsam-fir, tamarack, white birch, and poplar. . . . The quality of its spontaneous productions may fairly be taken as indicative of a fertile soil. The width of this fertile belt of land varies at different parts of the river; but, taking its average about two miles on either side (and it probably is much more), there would be an area of reclaimable country of about 280 square miles, or 179,200 acres." This estimate, it should be noted, refers only to the lower reaches of the river, and does not include the country around Red Indian Lake, or that around the arms of the bay. The report adds: "At the mouth of the river the reclaimable land extends to the northward for about five miles, terminating with the northern arm; and there are large tracts around Norris Arm, and in the valley of the Great Rattling Brook, which are capable of cultivation. The fertility of the soil at this part of the region is amply testified wherever cultivation has been attempted, producing roots, potatoes, grass, and other crops of the finest description, while as a grazing or stock-raising country it can hardly be surpassed. The surface-soil is generally of sand or a sandy loam, which at the upper part of the valley is underlaid by a drift of clay and gravel, while at the lower parts the subsoil is tenacious, bluish, or drab-colored clay, which is occasionally slightly calcareous."

RESOURCES OF EXPLOITS VALLEY.

"No observant person visiting the Valley of the Exploits could fail to be impressed with the manifold advantages it presents for the prosecution of industrial pursuits, such as lumbering and agriculture. With a splendid river, abundant timber, and a fertile soil, the region that is now a wilderness might, by energy and enterprise, be soon converted into a thriving settlement, maintaining a large population."

UPPER VALLEY OF EXPLOITS. — MR. HOWLEY'S SURVEY.

In 1875 Mr. Howley made a survey of the upper valley of the Exploits River, in continuation of that of Mr. Murray in 1871. Above Red Indian Lake he found that the river is divided into two branches, — the main river, or Exploits proper, and the Victoria branch. The former rises not more than 12 miles from the sea-coast, flows through King George IV. Lake and several smaller ponds. "From this lake the course of the river is remarkably straight in a north-easterly direction, till it joins the Red Indian Lake at the end of upwards of 40 miles." Red Indian Lake is 468 feet above the level of the sea. The Victoria branch of the Exploits takes its origin between the White Bear and Grandy's Brook waters, which interlock each other, and the eastern branch of the LaPoile, and it flows generally nearly parallel with the main river to its junction with the Red Indian Lake, about four miles above the outlet. South-west from that junction, at the end of 47 miles, the river expands into a magnificent sheet of water called Victoria Lake, which is 16 miles long by a breadth of about three-quarters of a mile. Its whole area, including a bay about three miles long and over three-quarters of a mile wide, is nearly 20 square miles, and its elevation above the sea is 1,160 feet.

VICTORIA RIVER. — LAND AND TIMBER.

The character of the country through which these streams flow is varied. South of King George IV. Lake and

Victoria Lake "the country is one vast desolation of bare rock" with marshes interspersed. On the left bank of the Victoria there are areas of well-timbered land, averaging five miles in width, and rich "interval" land between Lloyd's Pond and Red Indian Lake. Sixteen miles up the Victoria River "the country greatly improves, and a large tract, well-wooded, generally level and covered by a good soil, prevails nearly up to Victoria Lake. This level and reclaimable land seems to extend to the eastward, with a few interruptions, to the Great Rattling Brook." The country south of Hodge's Hill, and on the southern side of the Exploits, "presents an unbroken dense forest, in a series of gentle undulations, as far as the eye can reach. The country between the Victoria and the head of Red Indian Lake is well timbered throughout."

EXTENT OF LAND AND TIMBER.

Commenting on this survey, Mr. Murray says: "From what Mr. Howley has ascertained regarding the country between the upper end of the Red Indian Lake and the Great Rattling Brook there would appear to be a tract of land, more or less reclaimable, at least 50 miles long, with an average width of 15 miles, which would comprise an area of about 750 square miles. If to that we were to allow say 50 square miles of similar country for the lower Exploits Valley, Peter's Brook, and Norris Arm, there would be 800 square miles upon the Exploits alone, more or less capable of supporting settlement. The pine timber, spruce, tamarack, and birch, over extensive areas, is reported to be of excellent quality and vigorous growth; and all these might become available were those regions opened out by main lines of road, for the construction of which no perceptible difficulties present themselves."

THE GANDER COUNTRY.

GANDER DISTRICT RESOURCES.

Rich in agricultural capabilities as is the yet unpeopled Valley of the Exploits, it is greatly surpassed by the valley of the Gander, which, when settled and cultivated, will be the most populous and flourishing agricultural region in the island. In 1874 Mr. Murray surveyed a portion of it, from the sea to the head of the Gander Lake. In 1876 Mr. Howley completed the work, by surveying the upper reaches of the river. The total length of the main Gander River is 100 miles; but another branch of it, called the South-west River, also empties into the Gander Lake, and is 80 miles in length. The area drained is nearly 3,000 square miles. Altogether, there are in this great expanse of county, including the whole of the Gander River and Lake, and the neighboring Gambo and Terra Nova valleys, no less than 1,700 square miles available for settlement. This, as will be shown when we come to describe the forests, is the finest and most extensive lumbering region in the island.

GANDER LAKE AND RIVER.

Gander River is approached from the sea at Sir Charles Hamilton's Sound, by the great inlet of Gander Bay, the head of which is in lat. 49° 17′ N., and long. 54° 29′ W. From this point to the lake the river is 30 miles in length. Gander Lake is 33 miles in length, with an area of 44 miles. The main branch of the river extends above the lake for the distance of 60 miles. Thus the lake intersects the finest part of the district, having one outlet by the river to Notre Dame Bay, on the shores of which are our copper mines. This river, with a small outlay, could be made navigable for boats of a good size, and down it timber could readily be floated were some present obstructions removed. The projected railway, from St. John's to Hall's Bay, will, when completed, traverse the Gander country. The eastern portion of the lake stretches

away, in serpentine form, towards Bonavista Bay, its extremity being separated from that bay by only nine miles of a very level country, over which a road or tramway could easily be constructed. Thus the valley has two outlets to the sea, and will one day have railway communication, in one direction with the mining district, in the other with the capital and the principal towns. It is difficult to imagine a district more favorably situated for a farming and lumbering population. Along the valley drained by the South-west River, 80 miles in length, the soil and timber are reported to be excellent. Pine logs, 80 feet in length, have been cut around the mouth of this river.

SOIL IN GANDER VALLEY.

In regard to the character of the soil Mr. Murray says, in his report: "Of this great expanse of country a very large proportion, particularly eastward from the main river, is of rich and fertile soil, as amply testified to by its indigenous produce, which, to a great extent, consists of pine and spruce of a superior size and description. . . With the almost unrivalled capabilities the country possesses for grass-growing, breeding, and rearing of stock, can hardly fail to become one of the great future industries of the province."

MR. HOWLEY'S REPORT OF GANDER COUNTRY.

Mr. Howley, who completed the survey of the Gander River above the lake, says, in his report: "Within the immense region drained by the Gander and Gambo rivers there is a vast area of country capable of being easily reclaimed and converted from its present state of wilderness into agricultural settlements. . . . The country lying above the great lake, and forming the valleys of the two rivers, presents everywhere a gently undulating surface, rising to a moderate height in its more elevated parts, and sloping gradually and with beautiful regularity down to the rivers' banks on either side. For a distance of 30 miles above the lake, and at the least two miles on the main and eastern side of

the south-west rivers, the country is of this character, giving a block of 30 miles long by 10 miles wide, or an area of 300 square miles, covered with a deep, rich, yellow sandy loam. Nearly every acre of these 300 square miles is well adapted for agricultural purposes, while the whole is, or was at one time, densely timbered with magnificent pine, spruce, fir, and white birch. The islands or intervals in the river, especially near their outlets, are perfectly level, and covered with exceedingly rich and deep alluvial soil. Many of these flats are of considerable extent, and for the most part they support a large growth of timber; while a luxuriant crop of wild-grass flourishes round the banks, and on the lower levels. Much of the country surrounding the great lake is also well adapted for settlement, and the advantage of having a frontage on this future great highway will still more enhance its value. . . . The country itself is magnificent. I have never seen such an extent of level land in any other part of Newfoundland. It is not to say level in the general sense. It is composed of low, rounded ridges, and wide, sloping country, all densely timbered. There is not a hill anywhere near the river from which a good view can be obtained. . . . That the soil here, over a very great area, is of excellent quality and capable of yielding rich harvests, I cannot doubt. Taking everything into consideration, I do not think that a more promising country, or one more easy of access, could be found in British America. . . . In all my travels about the island I have nowhere seen anything like the quantity of pine timber to be met with here; and although the soil on the western side of the island is richer in some places, this country, taking all its advantages into consideration, offers more immediate inducement to settlers."

MINERALS OF THE GANDER.

In addition to its agricultural and lumbering capabilities the Gander country gives promise of becoming one day a mining region. The rocks of the serpentine group, having all the characteristics of the copper-bearing formation in

Notre Dame Bay, are extensively developed in the Gander district, not only on the north and north-east of the lake, but also on the main river above the lake, where they occupy an immense area. "It is only reasonable to suppose," says Mr. Howley, "that the ores of copper and nickel will be found to exist here also."

GAMBO RIVER TIMBER.

Of the Gambo River Mr. Howley says: "The timber on the Gambo, especially in the valley of the Triton River, is very fine. Pine is abundant, and, though not generally so large as that of the Gander, is of excellent quality. The white birch, spruce, and fir, along the banks of the river, are remarkably fine; indeed, I have seldom seen finer in any part of the island. The land available for general agriculture in the valley of the Gambo is not extensive, being chiefly confined to the alluvial flats on either side of the river. These, however, are frequently richly luxuriant, as testified by the indigenous vegetation, especially in the valley of the Triton River, where they are generally upwards of a mile in width, extending from the outlet into the upper ponds, and to the forks."

TOPOGRAPHY OF THE GAMBO.

Regarding the topography of this region Mr. Howley says: "The Gambo River is approached from the sea by a long narrow arm of the Great Bay of Bonavista, which stretches inland some twenty miles from the open water of the latter, bearing generally south-west by west, and north-east by east. The river enters at its extreme head, its mouth being situated in lat. 48° 46′ 5″, long. 54° 12′ 32″. Two miles and three-quarters from its outlet it expands into a long, narrow lake, known to the lumbermen as the First or Lower Gambo Pond. It then contracts at a place called the Straits, for a little over one mile, and expands again into the Second, or Upper Gambo Pond, nearly equal in length to the first, but somewhat wider. Triton River enters this lake in a bay

about three miles from its head, the Riverhead Brook falling in at its extreme western end."

SMALLER AGRICULTURAL SECTIONS.

We have now gone over the great agricultural regions on the western and eastern coasts of the island, and shown the extent and character of the lands suited for settlement in those regions, as well as their chief topographical features. The smaller tracts of land fitted for agricultural operations are too numerous to admit of a detailed account. They are found along the banks of the smaller streams and around the heads of all the great bays. In many places they are found in small and detached patches, with large stretches of swampy or rocky land between, but, united, they would constitute a very large area of valuable land. The principal of these minor farming districts are in Bonavista Bay, around the shores and arms of which there is much fertile soil, — the north side of Smith's Sound, Trinity Bay, Placentia Bay, St. Mary's peninsula, and especially the Salmonier arm of that bay, where there is a very considerable extent of good soil, but little of which is yet under cultivation. Though much of the peninsula of Avalon consists of poor, rocky, swampy, or absolutely sterile soil, yet there are, in the regions indicated, — the heads of the bays and the banks of the various rivers, — enough fertile soil to sustain a large population. Many of the districts, too, where there is little arable land, are admirably fitted for grazing cattle and sheep, and general stock-raising.

CHAPTER IV.

TOWNSHIP SURVEY IN THE PENINSULA OF AVALON, ALONG THE LINE OF RAILWAY.

MR. HARVEY'S TOWNSHIP SURVEY IN AVALON.

DURING the last two years a very useful and important township survey has been conducted in that part of the peninsula of Avalon which lies between Conception and Trinity bays, and through which the railway between St. John's and Harbor Grace runs. The object is to facilitate settlement of those lands which, being situated on each side of the railway, are thus greatly enhanced in value, and will be eagerly sought for by intending settlers. The system of blocking out the townships is the same as that adopted in the United States and Canada. The townships are each six miles square, and thus contain 36 square miles. They are subdivided into square mile blocks, each having its own number, the numbers ranging from one to thirty-six, and arranged on a map. Each square mile again can be subdivided into four equal parts, each containing 160 acres, which constitute a farm.

This survey has been carried out by Mr. Charles J. Harvey, C.E., in 1883, 1884, and 1885. His reports for the first two of those years have been published; that of 1885 has not yet been printed. In the last-named year Mr. J. P. Howley was also engaged in the same survey.

LAND AND TIMBER.

From Mr. Harvey's reports we learn that this region, which was regarded as one of the least promising in the island, contains very large quantities of fine timber, and many thousands of acres well suited to agricultural purposes. The areas of good land are not generally large, but a very considerable population can be located on good farms along

the line of railway, which presents facilities for conveying produce to markets in Harbor Grace, St. John's, and other places, where high prices will be obtained.

A few extracts from these reports will show the character of the country surveyed and the locality of the fertile areas. As only a very few of the sectional lines of the townships are yet run, it is impossible as yet to determine exactly the area of good land and timber which may be available; but, when the subdividing lines are run a mile apart, a more accurate knowledge of the country will be obtained.

FROM SALMON COVE TO COLINET.

In the survey of 1884 the starting-point was Salmon Cove, on the north shore of Conception Bay. The first line which was run took the direction of the Blue Hill range, past Spread Eagle Peak, where a magnificent view of the country around for 20 miles is obtained. Colliers River and Colliers Big Pond were first reached, and then the valley of the Goulds Brook. "Here the soil and timber were superior to any yet seen since leaving Salmon Cove." Big Barren Pond was the next point. The country thus traversed "is not fertile, though some spots contain good land, particularly Goulds Brook Valley." From the west side of Big Barren Pond to Hodge Water River "the line passed over an almost continuous barren with a few wooded hummocks scattered on it. Some very fine timber was seen between Hodge Water River and the junction where the branch line of railway to Harbor Grace starts. The best of it was witch-hazel or yellow-birch and fir. . . . At Big Island Pond some very good timber was seen, — spruce, fir, and yellow-birch." The country next traversed was marshy, with wooded hillocks, till Colinet Valley was reached. "Here good soil and timber were seen, the principal varieties of wood being fir and yellow-birch." Goulds Brook Valley was again reached. "It contains a large area of land which is rich in soil and covered with timber of large size and good quality, and capable of being farmed to advantage. A very large

quantity of timber has been cut in this neighborhood already, but still there remains much available for ship-building, house-building, cooperage, firewood, and fencing."

TIMBER. — CULTIVABLE LAND.

Mr. Harvey closes his report for 1883 as follows: "There is no doubt that the interior of Avalon is rich in timber yet, though so much has been already cut. One beneficial result of the railway will be to open up at once a ready means of access to many valuable localities, where all sorts of timber can be procured that are required in this country, with the exception of pine. Pine is not plentiful, and wherever accesible has been already largely cut out. It is also certain that there is a large area of land very well adapted for cultivation and farming, particularly in Goulds Brook and Colinet valleys. The Colinet Valley is fully equal to that of Salmonier, which it much resembles. The scenery and appearance of many of the ponds are very fine, and trout of large size and good quality are abundant in many places, particularly in the Colinet and Hodge Water rivers."

EXTENT OF SURVEY.

The total mileage of the survey was 70 miles, the area covered being 72 square miles, equal to 46,080 acres. A distinguishing feature in the region was the abundant supply of water, so important in an agricultural settlement.

SURVEY OF 1884.

Mr. Harvey's second township survey was made in 1884 in the same region: "Eighty-five miles were cut and measured, which may be classified as follows: 30 miles of block lines or township boundaries; 52 miles of subdividings or section lines; three miles of road survey, being the location of a road from Broad Cove River Bridge, on the railway (about nine miles north of Harbor Grace Junction), to Broad Cove, a part of Dildo Harbor, in Trinity Bay.

DIRECTION OF LINES RUN.

The first meridian line cut crossed Colliers Big Pond, and then the railway, touched the west shore of Hearn's Pond, (the waters of Colliers Bay River), and finally crossed a very large pond (the head-waters of the east branch of the Colinet River). "The country traversed on this line was in general of a good description, and the timber seen was small, the principal variety being spruce. A small area of good land was passed through on the north side of Colliers Big Pond, and also as the south extremity of the meridian was approached, near the township run in 1883. These areas produced good yellow birch and white birch and fir."

The next meridian line cut commenced on the base line of 1883, at the 18-mile post, and ran northwards towards Trinity Bay. Very little good land was passed through on this line.

"From the north end of this meridian a township boundary was run eastward for six miles, crossing Dildo Pond and the railway track. On the west side of Dildo Pond a large area of fine soil, covered with large white and yellow birches, extends the whole length of the pond. On the east side of the pond the land is not so good, and the timber is principally small spruce till reaching the third-mile post, after which a number of good ridges of land covered with birch were crossed. Dildo Pond is a fine sheet of water, being $3\frac{1}{2}$ miles long, and varying from an eighth to three-quarters of a mile in breadth. The scenery here is very picturesque, and the pond and its tributaries abound in fine trout and salmon. The railway is built close to the water's edge for a mile and a half. Gander Pond, another beautiful lake, is crossed near the fifth-mile post on this township line. The land on the east shore at this point is marshy and barren, but farther south it is much better, and covered with good timber."

The next line run traversed "a very broken hilly country, dotted with ponds, but the soil of these hills was the best

seen in this portion of the country, and far superior to the soil near St. John's. The telegraph line was also crossed, and in its neighborhood the soil was found to be very rich, and free from rocks, boulders, and stones. A large pond was crossed, called Goose Pond, just south of the telegraph line, and the soil on the north and east shores was of the same excellent quality. This line finally reached the railway line at Rocky-river Bridge. All along this line very fine large timber was seen, for the most part white and yellow birch, and fir, also some spruce."

SPANIARDS BAY VALLEY.

"The valley of Spaniards Bay contains a fair amount of good land, covered at one time with valuable timber, which has been nearly all cut out as far as the road reaches; but a large area farther inland yet remains available. The varieties are yellow, and white birch, fir and spruce."

Township 18 "contains a considerable area of fine land, covered with timber of good quality, principally birch, fir, spruce; pine being very scarce. The best land was seen on the west shore of Dildo Pond, in the valley of Dildo River, in the neighborhood of Goose Pond and the telegraph line."

ROAD SURVEY TO DILDO.

"A road survey was made from the railway at Broad Cove River Bridge to Broad Cove, in Dildo Harbor, Trinity Bay. A level track, easy for road construction, was obtained nearly three miles in length, by following the valley of the Broad Cove River, passing near the south shore of Broad Cove Pond, and then crossing a short ridge dividing the pond from the harbor. This route would admit of a railway being constructed here, if such a branch were deemed necessary. Such a line would only be three miles in length, and would connect a large portion of Trinity Bay immediately with the railway, as a small steamer can run to Trinity Harbor in about six hours from Dildo Cove."

RESULTS OF SURVEY.

"The result of the season's work is very valuable in obtaining the topography of a portion of the country never previously surveyed, and in establishing the position of the railway in many places, thus rendering it possible to give correct locations of land grants along the line, which otherwise would have been impossible. The surveys show that at least one-fourth of this part of the peninsula of Avalon is occupied by ponds and lakes, nearly all of which are swarming with trout. These ponds and rivers would form an excellent field for experiments in the artificial breeding of fish, a subject of great practical value, as, if fish were successfully propagated here, they would prove a useful article of diet to settlers.

"A considerable area of the country has a soil so rocky, or else so marshy, as to be unfit for agriculture. I estimate that out of the eight townships over which my township surveys extended not more than seventy square miles can be calculated on as capable of producing good crops. But if the marshes are found to be reclaimable, as I think many of them are, a large area would be available for meadows and pasturage; and so stock-raising could be prosecuted successfully.

"The best localities for good land are Goulds Brook, Rocky River, Colinet River, Dildo River and Pond, near the telegraph line, Spaniards Bay River, and North River."

EXTENT OF LAND IN TOWNSHIPS.

When the whole land along the railway has been surveyed, in the same way, it will be found that the total area of reclaimable land, even in this unpromising section of the country, is far greater than might be supposed, and that a large number of good farms might be located at no great distances from the line of railway. Those eight townships contain 70 square miles, or 44,800 acres of good land. This would give 448 farms of 100 acres each.

CENSUS OF 1874.

The census of 1874 gave the following returns of agricultural operations. (The census of 1884 is not yet published in full) : —

Land, acres cultivated	36,339
Cattle (not milch-cows), head	6,665
Milch cows	7,273
Horses	4,057
Sheep	28,766
Swine	22,955
Goats	6,510
Butter, pounds	216,594
Hay, tons cut	24,363
Wheat, bushels	84
Barley, bushels	546
Oats, bushels	7,104
Potatoes, barrels	331,959
Turnips, barrels	14,133
Other root crops, barrels	5,487

PROGRESS OF AGRICULTURE LAST EIGHT YEARS.

That the advance of agriculture has been considerable during the last eight years will appear from the following returns furnished by the Surveyor-General's Department : —

Acres of land granted during the past eight years (exclusive of 4,900 acres granted to the railway company)	16,235
Acres of land applied for, for agricultural purposes, during the last eight years	192,144

Thus it is evident that as the agricultural capabilities of the country become better known, and the position of the good lands is ascertained by qualified surveyors, the settlement of the country proceeds with accelerated pace.

SIR JOHN HARVEY'S OPINION.

Before proceeding to the next topic it may not be amiss to quote a few of the recorded opinions of the best judges in regard to the climate, soil, and agricultural capabilities of the island. Sir John Harvey, who was Governor of the colony in 1842, said, "Both as regards climate and agricultural capabilities Newfoundland in many respects need not shrink from a comparison with the most favored provinces of North America. Its summers, though short, enjoy an extraordinary degree of vegetative power, which only requires to be duly taken advantage of; its winters are neither unusually long nor severe, and its autumnal seasons are as open and fine as those of any of the surrounding colonies. In point of rich, natural grasses, no part of North America produces greater abundance. Newfoundland, in fact, appears to me to be calculated to become essentially a rich grazing country; and its varied agricultural resources appear only to require roads and settlements to force them into highly remunerative development."

SIR RICHARD BONNYCASTLE'S OPINION.

Sir Richard Bonnycastle in his work on Newfoundland speaks of the island "as possessing a climate of extraordinary salubrity," and predicts that if opened up for settlement it would "take its rank among the most flourishing colonies of the neighboring continent. . . . Cucumbers, melons, cabbages, cauliflowers, broccoli, beet, parsnips, carrots, peas, potatoes flourish luxuriantly. . . . The garden strawberries and raspberries of every variety thrive without more than the usual care. . . . Potatoes, oats, turnips, and all the necessary vegetables, can readily be reared, even on the very worst portion of such a wilderness as that of the littoral. . . . The very worst portion of the soil is that in the neighborhood of St. John's, and yet here, in all directions, the plough speeds and the ancient forest has vanished."

DR. MULLOCK'S OPINION.

The Right Rev. Dr. Mullock, Roman Catholic Bishop of Newfoundland, in one of his published lectures said: "All garden vegetables — cabbages, carrots, turnips, salads, etc. — are brought to the highest perfection; and the climate appears specially adapted to impart succulency to them. The potato, before the rot, was of the finest quality. It has now nearly recovered. Wheat will ripen very well. I have never seen finer barley than the growth of Newfoundland, — the same is true of oats. Hops are most luxuriant, and so are strawberries, currants, gooseberries, cherries, and many other species of fruit. . . . My estimate of the agricultural capabilities of Newfoundland, comparing it with what I have seen in the North of Europe, is, that if we had a large agricultural population we could support them in comfort."

JOINT COMMITTEE ON RAILWAY.

In 1880 a Joint Committee of the Legislative Council and House of Assembly, appointed to consider the question of constructing a railway in the island, presented a report, of which the following are extracts: "Our agricultural industry, though prosecuted to a valuable extent, is yet susceptible of very enlarged development. Vast stretches of agricultural land, extending from Trinity Bay, north, along the heads of Bonavista Bay, Gander Bay, and Exploits River, as well as on the west coast, need only the employment of well-directed labor to convert them into means of independent support for thousands of the population. . . . The inquiry is further suggested whether this colony should not become an exporter of live stock; and we have little difficulty in affirming this position. For grazing purposes we have large tracts that we believe cannot be surpassed in British North America; and when we regard our proximity to England, and the all-important consideration of a short voyage for live stock, the advantages we possess in this are too manifest to be the subject of question or argument."

CHAPTER V.

THE FORESTS OF NEWFOUNDLAND.

EXTENT OF TIMBER.

ALTHOUGH from time to time fires have destroyed large sections of the heavily-timbered districts, yet the forest wealth still remaining and yet unutilized is immense. These forests are found chiefly in the valleys of the great rivers, as has been already stated, and along the banks of their tributaries; also in the country around St. George's Bay and Port-a-Port. The varieties of the indigenous forest timbers are white pine, white and black spruce, tamarack or larch, fir, yellow and white birch. Once the country is fairly opened up, a great timber trade will be created. The yellow birch, which abounds largely in St. George's Bay, is said to be equal in durability to English oak, and, with the spruces and larches, is admirably adapted for ship-building purposes.

THE GANDER COUNTRY'S LUMBERING CAPABILITIES.

The great valley of the Gander is destined to be the most important lumbering region in the island. It is covered with pine and spruce of the finest description; and the river and lake present every facility for floating logs to the sea-margin, where saw-mills could be erected. On both sides of the lake itself, water-power for driving machinery could be obtained in many places. Besides the river, an outlet could be found at Freshwater Bay, in Bonavista Bay, which is separated from the lake by a level tract only nine miles in length.

MR. MURRAY'S REPORT.

Mr. Murray reports as follows of this region: "Except where partially denuded by fire, the whole valley of the river, the shores of the lake, and the banks of the tributaries, are

all densely clad by forest, among the most conspicuous trees of which are pines, to all external appearance of the finest description. Upon the South-west Arm, and at various parts of the lake, groves of pine may be seen where the average girth of the trees is not much, if anything, less than nine feet, and where many individual trees will reach to 11, 12, and even 14 feet. On about one acre of surface I measured 15 or 20 trees the diameters of which varied from two and a half to four and a half feet; and these, moreover, were straight, tall, and sound, with stems running up symmetrically for upwards of 50 feet without knot or branch." He estimated that there was here "an area of not less than 500 square miles worthy of being laid out as timber limits, where an immense timber trade might be carried on successfully. . . . "Were the tracts surrounding the head-waters of the Gambo, and the south-west branch to be taken into account, I have little doubt the area would be extended to 1,000 square miles. . . . The establishment of the lumber trade in these regions would only be a preliminary movement towards the ultimate permanent settlement of the land." The soil over an enormous area is rich and fertile, the surface level or gently undulating. The country is capable of raising all or most of the cereal crops in ample abundance.

MR. HOWLEY'S REPORT OF GANDER FORESTS.

Mr. Howley says, in his report on the same region: "From careful examination of the forests at many different points, and particularly as regards the limits of available pine, I feel myself in a position to furnish the following estimate of the area supporting that timber, with tolerable confidence: —

	Sq. Miles.
Area of pine lands on the lower valley of the Gander River, and north side of the lake	200
Valley of the Main and South-west Rivers above the lake	300
Country along the south side of the lake and across to Fresh-water Bay	200
Valley of the Gambo and Triton River, with their tributaries	150
Total	850

"I conceive it probable that still further investigation may bring the total area up to 1,000 miles. Most, if not all, the pine here referred to is of the white variety, *Pinus strobus*, probably the most valuable species for the manufacture of lumber." Fires have swept over many portions of this district, "but the pine, though scorched, does not appear otherwise to be much injured so long as it remains standing. I have examined hundreds of trees which, though stript of their leaves and bark, and bleached hard and white by long exposure, seem nevertheless to be in perfectly sound condition. The fact of its being so sound and thoroughly seasoned, occasioning considerable loss of weight, and rendering it so much more buoyant in the water, would, it appeared to me, greatly counterbalance any other defects it may have sustained."

MR. MURRAY'S SUGGESTIONS.

In Mr. Murray's report for 1874 he strongly urges the propriety of opening up this great region for lumbering purposes. He says: "As nearly the whole area lying between the eastern arm of the lake and the main river, and a great extent of country on the north-west side of the latter, as well as on the south side of the lake, and for some distance up the south-west branch, is thickly grown over by magnificent pine and spruce, I cannot conceive any better possible plan for gradually improving the surface of the country, and preparing it for regular settlement, than by encouraging the introduction of capital to be applied towards utilizing these splendid forests of timber. Nor is the value of timber the sole consideration, for it will, most assuredly, be found that the opening up and settlement of the country will primarily be brought about by the operations of the lumberer, legitimately or otherwise; and many of those employed in clearing the forest will be found among the very first permanent occupiers of the soil. With the timber trade, cattle, horses, and sheep will speedily be introduced; grain, grass, and roots will be cultivated; while labor will be in such demand

that there need not be an unemployed hand throughout the year, from one end to the other of the colony, and beggary ought to utterly disappear from the land."

THE EXPLOITS AS A LUMBERING REGION

Though not nearly equal to the Gander country in forest wealth, the valley of the Exploits contains a large quantity of pine and other valuable timber. Near the mouth of the river a steam saw-mill has been successfully at work for many years, and no difficulty is experienced in procuring a large supply of material. In his report for 1871 Mr. Murray says: "The forests of the Exploits Valley consist of pine, spruce, balsam, fir, tamarack, white birch, and poplar. On the lower reaches of the river and tributaries, below the Grand Falls, pine is or has been abundant, some of it apparently of good quality for conversion into ordinary lumber; but there are extensive areas, especially near the Great Rattling Brook where the timber has been completely swept away by fire. Moreover, on the more accessible parts of the region, many of the most valuable trees have disappeared, having been culled out long since to supply logs to a saw-mill which was formerly in operation near the outlet of Peter's Brook into Peter's Arm. . . . Between the Grand Falls and Badger Brook, at many parts, on both sides of the main river, pine was observed to flourish luxuriantly, much of which appeared to be of excellent quality, being often of fair dimensions, straight and tall. These reaches also display a fine growth of other varieties of timber, and at some parts, especially about the forks of the Sandy Brook, white birch often attains a very large size; this being one of the few localities where the Indians procure bark capable of being used for the construction of canoes."

"Above the junction of Badger Brook the surface of the country is exceedingly level over a wide area on both sides of the river, up to the Grand Falls, and is densely covered by forest of the usual varieties; but the trees at this part are

mostly small, being the immature successors of the ancient forests, entirely destroyed many years ago by fire."

FROM THE FALLS TO RED INDIAN LAKE.

Of the country between the Upper Falls and the Red Indian Lake Mr. Murray says: "The whole region is still densely wooded, and good pine and other timber are not infrequent, being remnants of the old forest which had escaped the great conflagration. On the flats near the northern margin of the Red Indian Lake, particularly at the outlets of the larger brooks, pine and spruce trees of large size, straight and tall, were frequently observed; but back from the lake the timber is of stunted growth and of little value, scattered in detached woods over the surface of the great marshes and barrens. The southern side of the lake is densely wooded to the water's edge; and the country inland appears to be all forest for many miles back, broken only by occasional marshes or swamps which occupy the lower grounds between the ridges. The Indians who have visited the Victoria Lake state that good pine and spruce are abundant on the lower reaches of the brook."

In other reports Mr. Murray says: "From the Victoria River to the head of the Red Indian Lake the country is well timbered throughout. . . . The southern side of the Exploits presents an unbroken dense forest, in a series of gentle undulations, as far as the eye can reach. . . . With a splendid river, abundant timber, and a fertile soil, this region is marked out for a prosperous settlement."

THE HUMBER VALLEY TIMBER.

The valley of the Humber is another district richly-wooded, where lumbering operations have been carried on for many years on an extensive scale. A report of the Surveyor General, made between thirty and forty years ago, stated that "the hardwood found here consists chiefly of the different descriptions of birch, the yellow, called witch-hazel, within a quarter of a mile of the shore, was found measur-

ing, at six feet from the ground, from five to seven feet in circumference; and softwood, as pine, spruce, birch, etc., are to be had with as little difficulty, the whole consisting of a size sufficiently large for any kind of building, and in quantities abundant enough to become an article of export."

MR. MURRAY'S REPORT.

Mr. Murray's report for 1866 says: "Independently of its agricultural capabilities, this fine tract of country seems to present inducements for other branches of industry and enterprise in the quality of its timber, much of which is excellent. Tamarack, or juniper, is not rare; yellow-birch of large dimensions is abundant; white pine and spruce grow in the greatest profusion, frequently of a size and quality not greatly inferior, if not equal, to the best that is now largely brought into market in Gaspé, and other parts of the lower province of Canada."

MR. MCLEOD'S REPORT OF THE HUMBER.

Since Mr. Murray's survey was made, in 1866, the extensive lumbering operations on the Humber have very considerably reduced the quantity of good timber in the neighborbood of the river. In 1875 Mr. McLeod, a civil engineer, was sent to the Humber for the purpose of running a meridianal base line from a fixed point, for the purpose of locating timber limits both here and in the Gander country. In regard to the amount of timber still available for lumbering purposes on the Humber, Mr. McLeod's report says: "To give a rough estimate of the extent of fine timbered land from the mouth of the Humber to the Grand Pond Brook, I should say that in all there is not less than 20 square miles, which would on the average yield five trees of from 1,000 to 2,500 superficial feet each to the acre. This would give 3,200 trees to the square mile, which, at an average board measure of say 1,500 feet, gives, per square mile, 4,800,000 superficial feet. This multiplied by 20 gives 96,000,000 feet as the quantity of standing pine yet

on the Humber. There may not be half this and there possibly is much more. To pretend to give an accurate estimate, no matter how true the data upon which it may be based, for any one limited area, would be quite absurd, so wide are the limits of quantity, as well as quality. And, where the question of quality arises, I may say that there our only available information is from those by whom it is wrought, and from its relative standing in the market. The verdict of the former I need not record; that of the latter seems to say that the timber of this district is rather above the ordinary market run."

TON-TIMBERING.

"I cannot end this discussion of the timber of the Humber without expressing my entire disapproval of the system of 'ton-timbering' as carried on here. Not one-fourth of the timber cut down is removed; that is, three-fourths, more or less, of the timber felled is allowed to rot on the ground, which, if taken to the mill, would yield excellent 'sawn stuff.' Further, only the very best trees are available for 'ton-timbering;' so that the district over which these operations extend is, although not all *thoroughly* cut out, rendered uninviting to the mill-men, or, as they are called, 'loggers.'"

These are the principal lumbering regions, but, as already stated, the valleys around St. George's Bay and the Codroy valleys contain a fine growth of mixed forest timber, — pine, spruce, birch and fir. On most of the smaller streams, both on the western and eastern coasts, there are also groves of pine and various other trees, while the same holds good regarding the heads of many of the bays. It is thus evident that, in regard to forest wealth, Newfoundland holds no despicable place.

"It is very remarkable," says Mr. Howley, "that no species of cedar, beech, elm, or oak, have been met with in this country, although they are all common on the continent, and some of these varieties are known even to exist at Cape Breton."

CHAPTER VI.

CLIMATE.

TAKEN as a whole, the climate of the island is more temperate, and more favorable to health than that of the neighboring continent. The fierce summer heats of Canada and of the United States are unknown, as is also the intense cold of their winters. It is but rarely, and that only for a few hours, that the thermometer sinks below zero in winter; while the summer range rarely exceeds 80 degrees, and for the most part does not rise much above 70. Like all insular climates that of Newfoundland is variable and subject to sudden changes. The Arctic current exerts an unfavorable influence along the eastern coast; but, as a compensation, it brings with it the enormous wealth of cod and seals which has rendered the fisheries the most productive in the world. The Gulf Stream, which creates the fogs, modifies the cold; and if, at times, it darkens the skies, it paints the cheeks of the people with the rosy hues of health. The salubrity of the climate is evinced by the robust, healthy appearance of the people. Their clothing in winter does not require to be much warmer than that worn in Britain at the same season of the year. Open fireplaces are sufficient to warm the houses, and free exercise in the open air is attainable at all seasons.

FOGS.

The fogs, of which so much has been written, are, for the most part, confined to the southern and south-eastern seaboard, and seldom penetrate far inland. They are generated on the Banks by the meeting of the warm waters of the Gulf Stream with the cold Arctic current, and are wafted shoreward by southerly winds. This occurs only at certain seasons of the year, when the winds blow in that direction; but, during three-fourths of the year, the westerly winds

carry the vapors across the Atlantic, and the British Isles get the benefit of their moisture. In his journey across the island, in 1822, the traveller Cormack experienced but four foggy and drizzly days during two months; forty-one were bright, and only eight rainy days.

Mr. Howley, whose experience of the climate of the interior extends over fifteen years, says: "I have spent, more than once, four months in the interior without experiencing a genuine foggy day until reaching within twenty miles of the southern side of the island. During the entire months of July and August the weather in the interior was delightful, while fogs prevailed at the same time along the southern coast."

DELANY'S OBSERVATIONS.

Observations taken at St. John's, by Mr. E. M. J. Delany, C.E., from 1857 to 1864, inclusive, showed that the average mean temperature for those eight years was 41.2 degrees; the average maximum height of the thermometer 83 degrees; the average minimum height of the thermometer 7 degrees; average number of days on which rain fell during those eight years was 105. The highest range of the thermometer was on July 27, 1857, when it reached 89 degrees; the lowest was on February 11, when it marked 2 degrees.

COMPARATIVE CLIMATES.

The following tables show the comparative climates of the places named: —

Mean Temperature for 1874.

	Degrees.
St. George's Bay, Newfoundland	43.8
Windsor, Nova Scotia	42.7
Toronto	44.3
Winnipeg, Manitoba	30.8

Total Days of Rain in Four Months.

St. George's Bay	34
Toronto	47
Winnipeg	52
Truro, N.S.	68

From these tables it appears that the average temperatures for the year of Bay St. George and Toronto are almost equal, that of Manitoba being 13 degrees below Newfoundland.

The number of months in which the thermometer did not reach the freezing-point was in Newfoundland four, in Toronto four, in Manitoba three, and in Nova Scotia four. This fact goes to prove that the danger of vegetation being injured by frost is less in Newfoundland than in Manitoba, and no greater than in any part of Canada.

CHAPTER VII.

MINERAL RESOURCES.

DISCOVERY OF MINES.

It was not till a comparatively recent date that Newfoundland was known to contain mineral treasures of immense value. For many years the late Mr. C. F. Bennett was the pioneer of mining enterprise, and he stood in a minority of one as a believer in the existence of minerals in the island. To Mr. Smith McKay belongs the honor of discovering the first considerable deposit of copper ore. His discovery was made in 1857, at a small fishing-hamlet called Tilt Cove, on the north shore of Notre Dame Bay. In 1864 mining operations were commenced here under the joint direction of Messrs. Bennett & McKay. These went on, with more or less activity, and with such marked success that, in 1879, it was found that Tilt Cove mine had yielded close on 50,000 tons of copper ore, valued at $1,572,154, and nickel ore worth $32,740. In 1875 another copper mine was opened at Betts Cove, about a dozen miles south of Tilt Cove. Under Mr. Francis Ellershausen operations were carried on here with extraordinary activity; and in 1879 the quantity of ore exported from Betts Cove and two other localities amounted to 123,556 tons, valued at $2,982,836. Even this success was eclipsed by the discovery in 1878 of a much larger deposit of copper ore at Little Bay, which is believed to be one of the most valuable copper mines in the world. It has been worked up to the present date with success; but the low price of copper ore in the market has caused operations to languish somewhat during the last two years. The depression, however, will only be temporary; and, with improved prices, mining operations will probably be resumed on a large scale. The returns of the ore exported from Little Bay will be found at the close of

this chapter. Up to 1879 the total quantity of ores exported from all the mines had reached £1,000,000 sterling in value. This placed Newfoundland sixth among the copper-producing countries of the world.

PROGRESS OF MINING INDUSTRY.

The success of these first enterprises led to the outbreak of a "copper-fever," and a rush to secure mineral lands took place. Speculation ran high; and along the shores of Notre Dame Bay, an extent of country nearly one hundred miles in length, and five or six in breadth, was speedily covered by mining licenses and grants. Numerous discoveries of copper ore were made at various places, and the metalliferous character of the whole region was established beyond a doubt. The speculators, however, for the most part, were not persons possessed of sufficient capital to carry on the expensive operations required in working a copper mine. Most of the claims, therefore, remain undeveloped, and now await the arrival of skilful and enterprising mining capitalists, who alone can carry out such extensive undertakings and render them remunerative. The "copper-fever" has long since subsided; and now copper-mining will be prosecuted as a steady industry by skilled capitalists; and gradually, as the country is opened up, it will be extended, and will furnish employment to a large number of the population.

SERPENTINE DEVELOPMENT.

The geological survey shows that the area of the serpentine rocks, in which the ore is found, exceeds 5,000 square miles. This may be regarded at present as the known extent of the mineral lands of the colony. Over this immense area copper and other ores may be searched for with a probability of success. It is not, however, in the serpentine that the ore is found, but immediately associated with a chloritic slate, very ferruginous, which occurs both above and below the serpentine. Where the serpentine appears there is always a possibility that this ore-bearing-chloritic slate

may be found, so that the serpentine becomes a guide to prospectors. Where no serpentine shows itself it is vain to look for copper ore. In one of his reports Mr. Murray says: —

HOW THE ORE OCCURS.

"The ores of copper, usually sulphurets, are found disseminated, or in layers, with iron pyrites in the chloritic slates and dioritic beds; but the more solid and valuable ores are concentrated in the folds and dislocations, particularly in the magnesian portion, by which the formation has been affected. The ores are also of frequent occurrence in white quartz veins near the same horizon. The surface rocks where these deposits exist are usually of a reddish, rusty-brown color, scored by remarkable minute reticulations, which weather in relief, giving a marked and peculiar aspect, which once seen is easily recognized, and may serve as a trustworthy guide to explorers in making preliminary examination of the ground."

LAUZON DIVISION OF THE QUEBEC GROUP.

The large development of serpentine rocks in the island must, therefore, be regarded as a fact of primary importance. These serpentines belong to what, in Canadian geology, is termed the Quebec Group of the Lower Silurian Series. "This group," says Sir William Logan, "may conveniently be separated into three divisions, the middle one of which has proved rich in metalliferous deposits in its course from the Southern Atlantic States of the American Union to Canada, and through Eastern Canada to Gaspé." This middle division, called the Lauzon division, is the one which is developed in Newfoundland, and in which all the copper mines are situated. "The Lauzon division," says Sir William Logan, "was at first united with the Levis division, but has been separated from it on account of its great mineralogical importance and distinctness, it being the metalliferous zone of the Lower Silurian in North America. It is rich in copper ores, chiefly as interstratified cupriferous slates, and is accompanied by silver, gold, nickel, and chromium ores."

EXTENT OF SERPENTINE DEVELOPMENT.

It is a most important question, therefore, in connection with the future of the island, "What is the extent of these ore-bearing serpentine rocks in the island?" The geological map which Mr. Murray has published enables us to answer that question with some degree of accuracy.

Commencing at Cape Norman, the extreme northern point of the island, we find serpentine developments of considerable extent from Pistolet Bay to Hare Bay, while another spread extends along the coast to Canada Bay. At Cape St. John begins the great serpentine development in which are situated all the existing mines. The whole shores of the great Bay of Notre Dame, together with its clusters of islands, are of the serpentine formation. This belt may be estimated at a length of 40 miles, the breadth being yet undetermined, without taking the islands into account. The greatest spread of the serpentine rocks is in the Gander country, where, as yet, they are unexplored. Round the shores of Bonne Bay and Bay of Islands there are also large developments of serpentine. Indeed, there are strong reasons for believing that the serpentine formation runs across the whole island; and as the interior is yet to a considerable extent unexplored, it may come to the surface in many places far inland.

MR. HOWLEY'S ESTIMATE OF SERPENTINE.

Mr. James P. Howley, Assistant Geologist, gives the following trustworthy estimate of the areas of the Serpentine Series in Newfoundland: —

	Sq. Miles.
Between Hare Bay and Pistolet Bay	230
North from Bonne Bay	350
South from Hare Bay	175
South from Bonne Bay	150
South from Bay of Islands	182
Surrounding Notre Dame Bay	1,400
Gander Lake and River Country	2,310
Bay d'Est River Country	300
Total	5,097

MR. MURRAY'S OPINION OF THE MINING REGION.

After a careful survey of the mining region, Mr. Murray thus speaks in his report for 1875: "I feel bound to state that the experience of the late investigation convinces me more than ever that many of the northern parts of this island, and the great Bay of Notre Dame in particular, are destined to develop into great mining centres, should capital and skilled labor be brought to bear in that direction. The frequent repetition of the mineral-bearing strata, associated with serpentine, chloritic slates and diorites, maintaining a nearly uniform character throughout their distribution, and invariably exhibiting metalliferous indications, all seem to warrant the expression of such an opinion. . . . In addition to the ores of copper, ores of nickel, magnetic, chromic, and specular iron, lead and sulphur ores have been found in abundance, and traces of the precious metals have occasionally been found, always near the same horizon. The usual form of the nickel ores is that of arsenical or copper nickel; but also occurs as millerite, or nickel pyrites; and as cloanthite, or an allied species, which is of a steel-gray or pale ruby-red color."

OTHER ORES BESIDES COPPER.

Copper is by no means the only ore found in the country. In the lower geological formations, which are largely represented, the existence of ores of various kinds, and of other valuable economic materials, has been ascertained. Magnetic iron ore has been found, though not yet in large masses, in the Laurentian; the presence of the precious metals is indicated in the Cambrian; while lead ore has been found in workable quantities in the Huronian and Lower Silurian. Coal has been found in pretty extensive beds in the carboniferous. Thus, while the great beds of serpentine hold the copper treasures, present indications warrant the belief that the Huronian rocks contain the precious metals. Extensive and valuable deposits of lead ore have been found. The whole

island, therefore, may be fairly regarded as more or less metalliferous, while the west coast, as we shall see presently, contains coal areas of much promise.

GOLD.

AURIFEROUS QUARTZ.

Mr. Murray, in his reports, has repeatedly expressed his belief that the equivalents of the gold-bearing rocks of Nova Scotia are developed in Newfoundland. Mr. Selwyn, Director of the Geological Survey of Canada, is of opinion that the auriferous rocks of Nova Scotia are the representatives of the Cambrian and lowest members of the Silurian system. It was not till 1880 that any discovery of auriferous quartz was made. In that year certain discoveries were made near Brigus, Conception Bay, which induced Mr. Murray to visit the locality. He tested one spot with the following results, as described in his report: "By the first blast from two to three cubic feet of rock were removed, all of which was carefully broken up, washed, and examined; which operation finally resulted in the display of 10 or 12 distinct "sights" of gold. In one fragment, about five pounds' weight, largely charged with dark-green chlorite, the gold shows itself in three places distinctly, while many small specks are perceptible by means of a good lens. The fracture of a fragment of milky white and translucent quartz, which was broken off the large piece, revealed two patches of gold, both of which together, if removed from the matrix, would probably produce about one pennyweight of the metal; while several small masses or nuggets were found adhering to the small broken fragments of quartz at the bottom of the pail in which the rock was washed, the largest of which contained about 10 or 12 grains of gold. . . . That a large area of country, in the regions referred to, is auriferous there can scarcely be a doubt, although nothing short of actual mining and practical experience can possibly prove what the value of the produce may be, or whether the

prospects of obtaining a remunerative return for the necessary outlay are favorable, or otherwise." His report concludes in the following words: "The indications of gold in this country, then, are certainly sufficiently favorable to merit a fair trial. And there are good reasons to hope and expect that ample capital applied to skilled and judicious labor may be found remunerative to future adventurers; while a new industry will be added to give employment to the laboring population of the island, and possibly bring this despised and but little-known colony into more prominence and consideration abroad than it hitherto has enjoyed."

CONFIRMATIONS OF MR. MURRAY'S REPORT.

It is satisfactory to know that Mr. Murray's anticipations regarding the auriferous quartz at Brigus have been confirmed. Samples of the quartz have been submitted to skilled analysts, and have been found to yield from four dwts. to thirteen dwts. of gold per ton. An average of eight dwts. per ton would give a handsome profit. Eminent mining engineers have examined some of the localities and recommended the prosecution of the enterprise. The quantity of quartz is very large, and much of it is favorably situated for mining operations. It is to be hoped therefore that the work will be vigorously prosecuted here.

LEAD.

LEAD ORE.

Whatever the future may disclose regarding gold there is no doubt that the island is rich in lead ore. This ore is not confined to any one formation, the presence of that metal having been observed as low as the Laurentian and as high as the coal measures. Lead was first discovered at La Manche, near the north-eastern extremity of Placentia Bay. The vein which was worked here is from three to six feet, and is chiefly of calc spar. The ore is distributed irregularly through the whole thickness of the vein, and sometimes

in pockets. Very favorable opinions have been expressed by high authorities regarding this mine, but its working has not been successful, and for many years all operations have been suspended.

PORT-A-PORT.

In 1875 a rich deposit of lead ore was found at Port-a-Port, on the western shore, and was worked for a short time with promising results; but being on the so-called "French shore" the French protested against it as a violation of their treaty rights, and the imperial authorities ordered the work to be stopped.

Magnetic iron ore has been found at Cairn Mountain, in St. George's Bay. Mr. Murray anticipates, from various indications, that its existence will be discovered along the range of the Laurentian hills. A considerable band of magnetic iron ore has also been found in the Tilt Cove mine.

GYPSUM AND MARBLE.

GYPSUM DEPOSITS.

Gypsum is found in immense developments. Mr. Murray says: "This mineral [gypsum] is, perhaps, distributed more profusely and in greater volume in the carboniferous country of the first area than in any part of the American continent of the same extent." There are, as we have seen already, enormous developments of gypsum at Codroy and Bay St. George. In the latter the quality is, in many places, of the finest description and of milky whiteness. Marbles, also, of almost every shade of color, have been produced from various parts of the coast, on both the eastern and western shores; while granite of the finest quality, building-stones, whetstones, and limestones are in ample profusion.

ROOFING-SLATE.

Another material which the island can supply in abundance is roofing-slate. The only slate quarries yet opened

are in Smith's Sound and Random Island, Trinity Bay. The development here is very extensive if duly worked; and the quality is declared by the highest authority to be equal to the best Welsh slate. Mr. Murray says of them: "Judging by the quality of the specimens which were brought from Smith's Sound, and the thickness of the strata attributed to their place in the formation, together with their proximity to the sea, these slates, when fully developed, can hardly fail to prove of very considerable commercial importance."

COAL.

SIR W. LOGAN ON COAL.

In 1866 Sir William Logan, the eminent geologist of Canada, in a letter addressed to the Attorney-General of Newfoundland in regard to the geological survey of the island which had commenced two years before, wrote as follows: "The nearest known coal deposits to the island of Newfoundland are the beds worked at Sydney, on the island of Cape Breton; and it is not unreasonable to suppose it probable that there will be a general analogy in the character of the measures on the opposite sides of the water dividing them. At Sydney, between the base of the coal measures and the workable seams, there is a thickness of barren strata of between 3,000 and 4,000 feet; and if the same conditions exist in Newfoundland it will depend upon the attitude of the strata whether we may expect the occurrence of coal beds there to become available to commerce. Mr. Murray observed a regular coal seam of six inches in thickness; but this would not be workable. Mr. Jukes has reported one of three feet; but at Sydney there are four workable seams, measuring altogether upwards of 15 feet in a thickness of 3,000 feet, that at the bottom being three feet; and no time should be lost in determining such facts as will make it known whether these seams exist, or may be reasonably searched for by capitalists, in the carboniferous areas of Newfoundland."

JUKES COAL SEAM.

The discovery of coal by Mr. Jukes, referred to in the foregoing extract, was made more than 40 years ago. The seam he found crops out on the right bank of the Middle Barachois Brook, south side of St. George's Bay, about eight miles from the coast. It is three feet in thickness, being cannel coal of excellent quality. Mr. Jukes says in his report: "There is no doubt of there being more beds in this vicinity, and of the probability of all the centre of this low district being occupied by a productive coal-field. Up the Codroy River, in a similar parallel, beds equally valuable are reported to exist." From fair data Mr. Jukes calculated the extent of this small portion of the coal basin of Newfoundland at about 25 miles wide by 10 miles in length.

MR. MURRAY ON THE COAL AREA OF ST. GEORGE'S BAY.

Mr. Murray has laid down the position of an outcrop upon his map, in order to show where workable seams of coal were likely to occur in St. George's Bay; and he calculates that the plan of one seam, there drawn as three feet in thickness, and occupying an area of 38 square miles, contains 54,720,000 chaldrons of coal, or 1,425,000 chaldrons per mile. A very considerable portion of this he believes may be found within workable depth. And this is but one of the many seams that may yet be found in the area between Cape Anguille and the head of St. George's Bay.

CARBONIFEROUS AREAS.

The whole carboniferous area of the west coast occupies three distinct areas, which Mr. Murray designates the "St. George's Trough, the Port-a-Port Trough, and the inland Trough of Humber River and Grand Lake. . . . The latter Trough," he says, "in its western outcrop, strikes inland from the lower end of Deer Lake towards Adie's Pond, and then along the left bank of the river towards the western

shores of White Bay. The eastern outcrop runs along the edge of the upper end of Deer Lake towards the Grand Lake. If the workable beds of Cape Breton exist at all in the central trough of Newfoundland, the country where they may be expected to be found will be the region between the Humber River and Sandy Lake, where there is ample room to bring in a sufficient accumulation of thickness." Mr. Jukes gave it as his opinion that "it is highly probable that coal may be found over the whole or greater part of it."

MR. HOWLEY'S COAL SEAM.

In 1873 another seam of coal was discovered by Mr. J. P. Howley on Robinson's Brook, about nine miles in a straight line from its mouth. "The thickness of this coal seam," he says, "judging from the dip of the rocks on either side, and the surface which was uncovered, viz., about six feet, appears to be about four feet. The mineral seemed to be homogeneous throughout, without any shaly divisions; it is very bituminous, burns with a clear flame like cannel coal, leaving a residue of white ash. The seam rests on an argillaceous rock with *Stigmaria*, but the roof was not distinctly seen. Ascending the stream above the coal crop we find a repetition of the strata seen on the west side of the synclinal, among the higher of which are beds of carbonaceous shale with *Stigmaria*.

"The outcrop of coal on Robinson's Brook bears from the uppermost outcrop seen on the Middle Barachois N. 30° E., distant one mile seventy chains; which, being nearly on the strike of the rocks, it may be fairly assumed that the seam on the former is either the continuation of that on the latter, or else another very nearly on the same horizon."

BORING RECOMMENDED.

In his report for 1873 Mr. Murray remarks on the few natural outcrops of coal which have yet been found in this region, but adds that this is not surprising "seeing that, except in the courses of the rivers, the whole region is

wrapped up in a thick mantle of superficial drift, which is itself grown over with a dense forest or covered with vast bog or marsh. Even in the river sections, as I have already shown to be the case in Robinson's Brook, the rocks are often so thickly covered over with boulders and other *débris* as to be all but totally concealed for miles together." For this reason he recommends the adoption of "a systematic plan of boring in sectional lines from the shores of St. George's Bay to the mountains, in each carboniferous area." This he considers should precede any direct attempt to open up mines.

ROBINSON'S BROOK COAL SEAM.

In 1884, while engaged in again surveying this portion of St. George's Bay, Mr. Howley took the opportunity of examining more carefully the coal seams previously discovered. On Robinson's Brook he uncovered the outcrop for several yards, and obtained a good section. In his report he says: "The seam, including under and upper clays, measures on the outcrop six feet across; but the angle of inclination which it makes with the horizon reduces the actual vertical thickness to about five feet. At least four feet of this thickness is good coal. It is rather harder than ordinary Sydney; very bituminous caking coal, emitting much gas while under combustion, and burns freely when once ignited. The dip of this bed is down-stream, or towards the north-west, and it appears to lie in a narrow synclinal trough, in which case it should come again to the surface from a mile to a mile and a half farther west, with an opposite inclination. Where, however, the latter outcrop might be expected, the rocks are totally concealed by *débris* for some distance.

"The Jukes seam, on the Little Barachois River (named after Mr. J. B. Jukes, who discovered it in 1840), was also visited. It is just two miles distant up-stream from our base line, while the side line separating townships VII. and VIII. crosses the river 30 chains below, and passes on the south

side within 16 chains of the outcrops. In 1873 Mr. Murray carefully examined and measured this seam, the result of which is given in the report for that year, as follows: —

Coal	1 ft. 3 in.
Coal in thin layers, alternating with thin layers of argillaceous and carbonaceous shale (Jukes seam)	2 ft. 3 in.
Total	3 ft. 6 in.

RELATIVE POSITION OF COAL SEAMS.

"A second seam, one foot five inches in thickness, occurs in the same section, about 120 feet higher up. It was the opinion of Mr. Murray at the time that the two latter seams were a continuation of the Robinson's Brook seam, on the opposite side of the trough, being here split in two by a wedge of sandstone, as is frequently the case in other coal-fields. The past season's observations, however, seem to point to a different conclusion, and I have reason to believe they are entirely distinct seams, — that on Robinson's Brook being at a lower horizon, — in which case it might be expected to cross the Little Barachois River, a half mile or so down the stream from the outcrop of Jukes seam. Should such prove to be the case, there would then be an aggregate thickness of not less than eight feet of coal in the three seams. The value or otherwise of these deposits will entirely depend on the superficial area they occupy, and this can only be satisfactorily determined by the application of the boring-rod. The boring-rod judiciously applied to this region would effect the double purpose of determining the extent of the coal seams already known to exist, and be, perhaps, the means of revealing others whose surface outcrops might never be discovered."

ESTIMATE OF EXTENT.

"As an instance of the importance of this coal area to the future of Newfoundland, the following estimate will give some idea. A seam of coal one foot thick would give per square acre 1,500 tons; per square mile, 960,000 tons. We have only to multiply this amount by eight (the aggregate thickness here), when the result per square mile would give 7,680,000 tons. Should the seams be persistent in thickness, and the boring prove them to occupy an area of say five square miles, we may then confidently rely upon no less than 38,400,000 tons of available coal in this district. As a further illustration of its importance, I may here state that the above estimate equals the whole annual output from all the Cape Breton mines, taking the average between the years 1858 and 1870 for 111 years to come."

BORINGS FOR COAL ON GRAND LAKE.

In 1879 and 1880 borings for coal were carried out, under the direction of Mr. Murray, in the neighborhood of Grand Lake. Here the indications of coal were so marked and so frequent that it was considered desirable to test this region with the boring-rod.

In the valley of Coal Brook, which falls into Grand Lake, thin irregular seams and nests of coal are observed in several places. Jukes found a seam of coal six inches thick on Coal Brook, and it has been re-discovered since his visit. Small fragments of coal occur on the bed of the brook, and are scattered sparsely along portions of the shore of Grand Lake. All these seemed to indicate the existence of coal seams. In his report for 1865 Mr. Murray said: "If the workable beds of Cape Breton are represented at all in Newfoundland, the country where they may be expected to be found will be in the region between the Humber River (west branch) and Sandy Pond, where there is ample room to bring a sufficient accumulation of thickness; although the character of the country at that part is sorely against surface examina-

tion, it being in a great measure covered over with dense vegetation or marsh."

The services of an experienced mineral borer having been secured, and proper apparatus provided, operations were commenced near Grand Lake in the summer of 1879. The first bore-hole was sunk to the depth of 250 feet, near the left bank of the river, about a quarter of a mile above its junction with Grand Lake.

The second bore-hole was sunk on the right bank of the river, nearly two miles from the outlet, but only to the depth of 42 feet. In the first bore some thin seams of coal were cut, but they were too slight to be of any economic importance. In the second bore no coal was found.

SECOND BORINGS.

Operations were renewed the following year, as the experiments of 1879 were not decisive in regard to the existence of workable seams of coal. Three borings were made in the same quarter, and the work was prosecuted from July till October, but without any successful results. The depth of the borings respectively was 21, 18, and 11 fathoms.

"The inference to be drawn from these borings," says Mr. Murray's report, "together with the known attitude of the lower beds of the formation, is that the strata over the whole area, between the two branches of the river, are, on the whole, exceedingly flat, or affected only by undulations so gentle as to leave but little room to bring in any great amount of superior measures." In consequence, boring operations were discontinued, as it was inferred that the areas which might contain workable seams of coal must be very limited in this region.

MR. MURRAY ON THE FORMATIONS.

"All the evidences," says Mr. Murray, "so far, point to the existence of a narrow, elliptical-formed trough, containing seams of coal of from one to eighteen inches in thickness, bounded upon the west side by the east branch of the

river, and on the east by the range of hills. Near the hill range the measures are disturbed, and are suddenly cut off by a fault, while, toward the river, and beyond it, they are affected only by a series of wave-like folds, in the depressions of which alone the higher measures of the formation need be expected."

CHAPTER VIII.

THE CROWN LANDS ACT.

THE law which regulates the sale or leasing of crown lands, for agricultural, lumbering, and mining purposes, is of the most liberal character, and well calculated to promote the settlement of the country and the development of its natural resources.

ACTS OF 1884 AND 1885.

The Crown Lands acts of 1884 and 1885 (a copy of which may be obtained by application to the office of the Surveyor-General) amend all former land acts, and consolidate all former statutes relating to crown lands into one elaborate and compendious enactment.

TOWNSHIP SURVEYS.

These acts first provide for the laying off of crown lands in townships containing 36 sections of one mile square each. Each section is to be divided into quarter sections of 160 acres. Provision is also made for grants of a half-quarter section, 80 acres, and of a quarter-quarter section, or 40 acres.

The 12th, 15th, 16th, and 17th sections of the act regulate the ordinary purchase and sale of lands.

PURCHASE OF LOTS.

The 12th section provides for the purchase of lots at an upset price, to be in no case less than 30 cents per acre, the grants being subject to certain conditions, such as the clearance and cultivation, within five years, of a proportion equal to ten acres in every hundred acres comprised in the grant.

LICENSES OF OCCUPATION.

The 15th section provides for the issue of licenses of occupation of crown lands on payment of a fee of $5.00 for each 160 acres, and for not more than 6,400 acres, subject to the condition that the licensee shall, within two years, settle upon the land one family for each 160 acres, and for a period of five years cause to be cleared at least two acres per year for every 100 acres so licensed, and continue the same under cultivation, and continue the same families thereon, or others in lieu thereof, for a period of 10 years from the expiration of the said five years; upon the performance of which conditions the licensee shall be entitled to a grant in fee of the said land.

LICENSES ENTITLING TO GRANTS.

The 16th section provides for licenses which shall eventually entitle the holder to a grant of 5,000 acres, upon terms to be imposed by the Governor in Council, which conditions shall in all cases include that the holder of the license shall within two years from the date of the license clear and have ready for crop at least 1 per cent. of the area comprised in the license; within three years, 2 per cent.; within four years, 4 per cent.; within five years, 7 per cent.; within six years, 10 per cent.; within seven years, 13 per cent.; within eight years, 16 per cent.; within nine years, 20 per cent.; and within ten years, 25 per cent.; and shall settle upon the land at least one family for every 320 acres.

FIFTY ACRES' LICENSES.

The 17th section provides for the issue of licenses of occupation for quantities not exceeding 50 acres, entitling to a grant in fee persons who shall continuously occupy for five years, and shall have cultivated two acres.

WATER-POWER LEASES.

Then there are provisions for *leasing the water-power* of lakes and rivers, guarded with conditions for preventing the water being reduced below certain levels, or being rendered noxious or deleterious.

FISH-BREEDING.

In the 19th section it is enacted that, for *encouraging the breeding of fish*, the right to use ponds, lakes, and rivers may be leased by the Government, together with such quantity of land adjoining as may be necessary for such purposes.

Sections 24 to 41 (inclusive) provide for Homestead Rights. Any head of a family or male of the age of eighteen may, by paying a fee of $10, obtain a location ticket for any quantity not exceeding 160 acres, for the purpose of securing a homestead right. To secure a grant in fee for such homestead, the holder of the location ticket must commence clearing within six months after its date; must build a house of certain dimensions, and clear and cultivate not less than three acres within two years, six acres within three years, and reside continuously upon the land for three years. These conditions being complied with, he is entitled to a grant in fee with homestead rights, and can obtain a license to occupy an adjoining 160 acres, or less, of crown lands, for which he will obtain a grant in fee at the expiration of three years at the price of 30 cents per acre.

IMMIGRANTS IN COMMUNITIES.

Provisions are also made for the settlement of immigrants in communities, and of homestead settlers in groups of not less than 20 families, should such desire to settle together in hamlets or villages. In such cases the Governor in Council may at discretion vary the requirements as to residence, but not as to cultivation of each separate quarter section as a homestead.

TIMBER AND TIMBER LANDS.

Sections 50 to 58 (inclusive) regulate the leasing of timber lands, subject to such reservations as are necessary for the purposes of the fisheries.

LICENSES TO CUT TIMBER.

Licenses to cut timber upon any forest tracts may be issued for any period not exceeding 21 years, subject to the payment of a bonus per square mile, varying according to the situation and value of the limit, and also of an annual ground-rent of $2.00 per square mile, and a royalty at the rate of 50 cents per 1,000 feet board measure on the tree cut down. For the other conditions attached to timber licenses the act itself must be consulted.

MINERAL LANDS.

SEARCH FOR MINERALS. — FREE RIGHT.

With regard to mineral lands, the Act of 1884 (amended, in 1885) provides that it shall be lawful for all persons to search and prospect for minerals upon all lands in the colony without first obtaining a license to search therein. To this regulation, however, gold is an exception, and to search for it a license must first be obtained.

MINING LEASES.

In case a person shall discover a vein, lode, or deposit of mineral, and desire to obtain a lease, he must mark the location with posts, in a prescribed manner, to an extent not exceeding one square mile. Then he shall give notice to the Surveyor-General, in writing, of his intention of applying for a lease, and also a description of the location. On payment of a fee of $50 this notice is to be duly recorded in the office of the Surveyor-General, and will give a priority of claim over any other applicant for the same land. Within a year from the date of putting down the posts the discoverer is then to apply for a lease, having first caused an accurate survey of the ground to be made and filed in the Office of

the Surveyor-General. Such application being made entitles the applicant to a *lease* of the mines and minerals contained in the location, for a term of five years, together with 50 acres of unoccupied surface land, subject to the condition of expending on the working of such mines and minerals $800 per annum for the first four years, and the fifth year the sum of $2,800; failure to do so entailing forfeiture of lease.

GRANTS IN FEE.

At any time within the period of five years a *grant* in fee of the mining location can be obtained upon proof being given to the Governor in Council that the sum of $6,000 has been expended on the working of the mines and minerals.

GOLD.

LICENSES OF SEARCH.

The 65th section provides that licenses to search for gold over an area of half a square mile for a period of one year may be obtained on payment of a fee of $25, which license shall be renewable for another year for a fee of $50.

GOLD-WORKING.

Leases to mine and work gold over an area of one-quarter of a square mile for a period of 21 years can be issued to the holder of a license to search on payment of a fee of $50, subject to the payment of a royalty of three per cent. on the amount of gold mined. If the sum of $500 per annum be not expended on the working of such gold mines, during the period of 21 years, the lease shall be forfeited.

SHEEP-RAISING.

In 1884 an act was passed for the encouragement of sheep-raising by which it is made competent for three-fourths of the electors resident within the boundaries set forth in their petition to apply to the Governor in Council for a proclamation prohibiting the keeping of dogs within the described area.

APPENDICES.

APPENDIX I.

Memoranda showing the Quantities and Value of Copper and Nickel Ores Exported from the Island of Newfoundland in the undermentioned Years.

Years.	Ports cleared from.	Copper.	Nickel.	Dollars.	Remarks, etc.
		Tons.	Tons.		
1854 to 1864	St. John's.....	627½	.....	22,980	Chiefly from Huronian rock.
1875 to 1879	"	544½	.....	19,179	Partly from openings in Notre Dame Bay.
	Total.....	1,172		42,159	
					Value of Nickel ore.
					Dollars.
1869	Union Mine, Tilt Cove	5,938	30	190,016	7,200
1870	" "	4,218	88	134,976	8,800
1871	" "	1,924	7	61,568	700
1872	" "	4,774	8	152,768	2,560
1873	" "	5,414	233	189,490	9,320
1874	" "	4,346	.....	104,304	....
1875	" "	4,838	17	179,006	1,360
1876	" "	6,464	28	232,704	2,800
1877	" "	5,389	.....	194,004	....
1878	" "	4,450	.....	97,966	....
1879	" "	1,964	.....	35,352	....
	Total.....	49,719	411	1,572,154	32,740
					The ores returned for 1878-79 were largely derived from Little Bay Mine, and partly from Colchester, all belonging to the Betts Cove Mining Company.
1875	Betts Cove.....	6,280	.....	232,360	
1876	"	18,670	.....	456,481	
1877	"	42,065	.....	1,093,768	
1878	"	31,370	.....	690,140	
1878	Regulus.....	750	.....	34,500	
1879	"	26,421⅓	.....	475,587	
	Total.....	123,556⅓		2,982,836	Thus, the total of the ores of Copper and Nickel exported since 1854 amounts to $4,623,889, or nearly £1,000,000 sterling.

APPENDIX I. — *Continued.*

Additional Returns of Ore Exported in the Years named.

Years.	Betts Cove Mine.			Little Bay Mine.		S. W. Arm Mine.	Hall's Bay Mine.	Rabbit's Arm Mine.	Value.
	Ore.	Regulus	Pyrites.	Ore.	Regulus	Ore.	Ore.	Ore.	
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.	£ Sterling.
1880	4,296	.....	.....	16,291	87	251	70	.....	£96,360
1881	4,294	.....	.....	22,640	9	235	130	544	159,721
1882	4,386	.....	.....	10,111	766	4	40	.....	93,603
1883	500	.....	.....	10,546	466	.....	.....	.....	62,389
1884	2,650	.....	2,450	737	706	.....	.....	.....	22,249
1885	.....	.....	.....	1,471	414	.....	.....	.....	11,919

APPENDIX II.

Table showing the Amount of Postage to be collected on Letters, Newspapers, Book Packets, etc., Posted in Newfoundland, for the following Countries:—

MEMORANDUM 1. — No Letter or other Article can be registered to the places (*a*); and to the Places marked (§) only letters can be registered.

MEM. 2. — No Book Packet or Packet of Newspapers addressed to the places marked (†) must exceed 2 lbs. in weight, and the weight of a Packet of Patterns for these places is limited to 8 ounces. A Book Packet or Packet of Patterns for New South Wales or Queensland is limited to 3 lbs. In all other cases weight is limited to 5 lbs.

MEM. 3. — There shall not be admitted for conveyance by Post, outside the Colony, any Letter or other Packet which may contain either Gold or Silver Money, Jewels or Precious Articles, or any other article whatever liable to Customs' duties.

The attention of Postmasters and the Public is particularly called to this Rule, as such Letters or Packets will not be forwarded.

	For a Letter.			For each Newspaper.	For Book Packets and Parcels.				Registration Fees on Letters, etc.
	Not exceeding ½ oz.	Above ½ oz. and not exceeding 1 oz.	Every succeeding ½ oz.		Under Two Ounces.	Two Ounces to Four Ounces.	Four Ounces to Eight Ounces.	Every succeeding Eight Ounces.	
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Aden	10	20	10	3	4	8	16	16	6
a Africa, West Coast.	12	24	12	3	6	12	24	24	6
a Ascension				3					12
Australia				3					
Austria †	5	10	5	1	2	4	8	8	5
Azores †									
Algeria §									

Postage Rates. — *Continued.*

	For a Letter.			For each Newspaper.	For Book Packets and Packets.				Registration Fees on Letters, etc.
	Not exceeding ½ oz.	Above ½ oz., and not exceeding 1 oz.	Every succeeding ½ oz.		Under Two Ounces.	Two Ounces to Four Ounces.	Four Ounces to Eight Ounces.	Every succeeding Eight Ounces.	
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Beyrout †	5	10	5	1	2	4	8	8	5
Belgium †									
Belize (Honduras)				2					
Bermuda	8	16	8	1	2	4	8	8	5
Borneo				2					6
Brazil	8	16	8	2	2	4	8	8	5
Buenos Ayres				2	4	8	16	16	
Bourbon (Isle of) §	10	20	10	2	4	8	16	16	5
Belgrade †	5	10	5	2	2	4	8	8	
Canada	5	10	5	1	1	2	4	4	5
Cape de Verds †	15	30	15	3	4	8	16	16	6
Cape of Good Hope				3					
Ceylon	10	20	10	3	4	8	16	16	5
Canary Islands †	5	10	5	2	2	4	8	8	5
Chili (*a*)	8	16	8	3	4	8	16	16	6
Costa Rica (*a*)				3					
China	10	20	10	3					
Constantinople	5	10	5	1	2	4	8	8	
Cuba	8	16	8	2	2	4	8	8	
Cape Breton	5	10	5	1	1	2	4	4	5
Dardanelles †	5	10	5	1	2	4	8	8	5
Denmark, *via* Belgium									
Ecuador (*a*)	8	16	8	3	4	8	16	16	
Egypt	5	10	5	2	2	4	8	8	5
Falkland Islands	10	20	10	3	4	8	16	16	6
Fernando Po									
France §	5	10	5	1	2	4	8	8	5
Germany †	5	10	5	1	2	4	8	8	5
Galatz †									
Galipoli									
Gambia	10	20	10	3	4	8	16	16	6
Gibraltar †	5	10	5	1	2	4	8	8	5
Gold Coast	10	20	10	3	4	8	16	16	6
Gray Town (*a*)									
Gautemala (*a*)									
Greece †	5	10	5	1	2	4	8	8	5
Halifax	5	10	5	1	1	2	4	4	5
Hayti (*a*)	8	16	8	3	4	8	16	16	
Holland †	5	10	5	1	2	4	8	8	5
Hong Kong	10	20	10	3	4	8	16	16	5

Postage Rates. — *Continued.*

	For a Letter.			For each Newspaper.	For Book Packets and Parcels.				Registration Fees on Letters, etc.
	Not exceeding ½ oz.	Above ½ oz., and not exceeding 1 oz.	Every succeeding ½ oz.		Under Two Ounces.	Two Ounces to Four Ounces.	Four Ounces to Eight Ounces.	Every succeeding Eight Ounces.	
	Cts.	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Italy †	5	10	5	1	2	4	8	8	
India	10	20	10	3	4	8	16	16	5
Ionian Islands †	5	10	5	1	2	4	8	8	
Jassy									
Labuan	10	20	10	3	4	8	16	16	5
Liberia									5
Larnica †	5	10	5	1	2	4	8	8	
Madeira †	5	10	5	1	2	4	8	8	5
Malta †									
Mauritius	10	20	10	3	4	8	16	16	
Mexico (*a*)									
Moldavia †	5	10	5	1	2	4	8	8	5
Mytelene (*a*)									
Montevideo (*a*)	10	20	10	3	4	8	16	16	6
Natal	12	24	12	3	6	12	24	24	12
New South Wales									
New Zealand				3					
New Brunswick	5	10	5	1	1	2	4	4	5
Nova Scotia					2	4	8	8	
Norway †				2					
Panama	10	20	10	2	4	8	16	16	6
Penang									
Peru (*a*)	5	10	5	2	2	4	8	8	
Poland †	8	16	8	1	4	8	16	16	5
Porto Rico	5	10	5	1	2	4	8	8	
Portugal †	5	10	5	1	1	2	4	4	
Prince Edward Island	12	24	12	3	6	12	24	24	12
Queensland	5	10	5	1	2	4	8	8	5
Rhodes †	10	20	10	2	4	8	16	16	5
Russia †									
Reunion §	5	10	5	1	2	4	8	8	5
Samsoun †									
Salonica †	15	30	15	3	4	8	16	16	5
Scutari †									
St. Helena (*a*)	10	20	10	3	4	8	16	16	
St. Croix									
Sierra Leone †									
Surinam									

Postage Rates. — *Concluded.*

	For a Letter.			For each Newspaper.	For Book Packets and Parcels.				Registration Fees on Letters, etc.
	Not exceeding ½ oz.	Above ½ oz., and not exceeding 1 oz.	Every succeeding ½ oz.		Under Two Ounces.	Two Ounces to Four Ounces.	Four Ounces to Eight Ounces.	Every succeeding Eight Ounces.	
	Cts.	*Cts.*	*Cts.*	*Cts*	*Cts.*	*Cts.*	*Cts.*	*Cts.*	*Cts.*
Smyrna †	5	10	5	1	2	4	8	8	5
Spain †				1					
Seres †				1					
Singapore	10	20	10	3	4	8	16	16	
Sweden, *via* Denmark †	5	10	5	1	2	4	8	8	
Switzerland, *via* Belgium †									
Syria† (*a*)									
Sydney, C.B.	5	10	5	1	1	2	4	4	
St. Pierre and Miquelon	5	10	5	1	2	4	8	8	
Tasmania	12	24	12	3	6	12	24	24	12
Tchesme †	5	10	5	1	2	4	8	8	5
Tenedos †									
Trebizond †									
Tultcha †									
Tunis †									
Turkey in Europe									
United Kingdom	5	10	5	[1] 1 [2] 2	1	2	4	4	4
United States	5	10	5	1	1	2	4	4	5
Varna †	5	10	5	1	2	4	8	8	5
Venezuela (*a*)	10	20	10	2	4	8	16	16	6
Victoria, Australia	12	24	12	3	6	12	24	24	12
West Indies, *via* Bermuda — Union	8	16	8	1	2	4	8	8	5

[1] Local. [2] Foreign.

Inland Postage.

Letters. — 3 cents per half ounce.

Books and Parcels. — 2 cents per quarter pound, or fraction thereof.

Registration. — 3 cents. Letters for French Colony of St. Pierre must be prepaid, 5 cents each rate.

Commercial Papers. — 5 cents up to 2 ounces; above that weight at Book rate. No package under the 5 cents.

APPENDIX III.

From St. John's to Tilt Cove, — 317 Miles.

St. John's *to* —												
47	Old Perlican.											
68	21	Trinity.										
87	40	19	Catalina.									
107	60	39	20	Bonavista.								
116	69	48	29	9	King's Cove.							
148	101	80	61	41	32	Greenspond.						
214	167	146	127	107	98	66	Fogo.					
232	185	164	145	125	116	84	18	Twillingate.				
249	202	181	162	142	133	101	35	17	Exploits.			
284	237	216	197	177	168	136	70	52	35	Little Bay Island.		
293	246	225	206	186	177	145	79	61	44	9	Little Bay.	
306	259	238	219	199	190	158	92	74	57	22	13	Nipper's Harbor.
309	262	241	222	202	193	161	95	77	60	25	16	3 Betts Cove.
317	270	249	230	210	201	169	103	85	68	33	24	11 8 Tilt Cove.

Tilt Cove to Battle Harbor, — 177 Miles.

Tilt Cove *to* —					
32	Coachman's Cove.				
82	50	Conche.			
118	86	36	St. Anthony.		
133	101	51	15	Griguet.	
177	145	95	59	44	Battle Harbor.

From St. John's to Bonne Bay,—651 Miles.

St. John's *to*—															
33	Ferryland.														
75	42	Trepassy.													
140	107	65	Placentia.												
190	157	115	50	Burin.											
201	168	126	61	11	St. Lawrence.										
235	202	160	95	45	34	St. Pierre.									
260	227	185	120	70	59	25	Fortune.								
283	250	208	143	93	82	48	23	Harbor Briton.							
308	275	233	168	118	107	73	48	25	Great Jervis.						
370	337	295	230	180	169	135	110	87	62	Burgeo.					
405	372	330	265	215	204	170	145	122	97	35	LaPoile.				
419	386	344	279	229	218	184	159	136	111	49	14	Rose Blanche.			
436	403	361	296	246	235	201	176	153	128	66	31	17	Channel.		
516	483	441	376	326	315	281	256	233	208	146	111	97	80	Bay St. George.	
610	577	536	470	420	409	375	350	327	302	240	205	191	174	94	Bay of Islands.
651	618	577	511	461	450	416	391	368	343	281	246	232	215	135	41 Bonne Bay.

From St. John's to Carbonear,—92 Miles (by Rail).

St. John's *to* —												
15	Topsail.											
18	3	Manuels.										
22	7	4	Kelligrews.									
27	12	9	5	Seal Cove.								
33	18	15	11	6	Holyrood.							
36	21	18	14	9	3	Harbor Main.						
39	24	21	17	12	6	3	Salmon Cove.					
47½	32½	29½	25½	20½	14½	11½	8½	Brigus Junction.				
57½	42½	39½	35½	30½	24½	21½	18½	10	Harbor Grace Junction.			
66½	51½	48½	44½	39½	33½	30½	27½	19	9	Broad Cove.		
74	60	57	53	48	42	39	36	27½	17½	7½	New Harbor Road.	
79	65	62	58	53	47	44	41	32½	22½	13½	5	Tilton.
84	70	67	63	58	52	49	46	37½	27½	18½	10	5 Harbor Grace.
92	78	75	71	66	60	57	54	45½	35½	26½	18	13 8 Carbonear.

Labrador.—From Salmon River to Cape Harrigan,—431 Miles.

SALMON RIVER *to*:—

21 Blanc Sablon.																											
31	10 Forteau.																										
37	16	6 Lance-au-Loup.																									
57	36	26	20 Red Bay.																								
84	63	53	47	27 Chateau.																							
97	76	66	60	40	13 Chimney Tickle.																						
101	80	70	64	44	17	4 Cape Charles.																					
107	86	76	70	50	23	10	6 Battle Harbor.																				
119	98	88	82	62	35	22	18	12 Spear Harbor.																			
131	110	100	94	74	47	34	30	24	12 Francis Harbor Bight.																		
146	125	115	109	89	62	49	45	39	27	15 Dead Island.																	
154	133	123	117	97	70	57	53	47	35	23	8 Venison Island.																
166	145	135	129	109	82	69	65	59	47	35	20	12 Punch Bowl.															
176	155	145	139	119	92	79	75	69	57	45	30	22	10 Batteaux.														
191	170	160	154	134	107	94	90	84	72	60	45	37	25	15 Indian Tickle.													
214	193	183	177	157	130	117	113	107	95	83	68	60	48	38	23 Grady.												
221	200	190	184	164	137	124	120	114	102	90	75	67	55	45	30	7 Long Island.											
234	213	203	197	177	150	137	133	127	115	103	88	80	68	58	43	20	13 Pack's Harbor.										
272	251	241	235	215	188	175	171	165	153	141	126	118	106	96	81	58	51	38 Indian Harbor.									
278	257	247	241	221	194	181	177	171	159	147	132	124	112	102	87	64	57	44	6 Brig Harbor.								
284	263	253	247	227	200	187	183	177	165	153	138	130	118	108	93	70	63	50	12	6 Holton.							
315	295	285	279	259	232	219	215	209	197	185	170	162	150	140	125	102	95	82	44	38	32 Cape Harrison.						
323	302	292	286	266	239	226	222	216	204	192	177	169	157	147	132	109	102	89	51	45	39	7 Ragged Harbor.					
339	318	308	302	282	255	242	238	232	220	208	193	185	173	163	148	125	118	105	67	61	55	23	16 Adnavick.				
353	332	322	316	296	269	256	252	246	234	222	207	199	187	177	162	139	132	119	81	75	69	37	30	14 Mannock's Island.			
376	355	345	339	319	292	279	275	269	251	245	230	222	210	200	185	162	155	142	104	98	92	60	53	37	23 Nack.		
381	360	350	344	324	297	284	280	274	262	250	235	227	215	205	190	167	160	147	109	103	97	65	58	42	28	5 Turnavick.	
431	410	400	394	374	347	334	330	324	312	300	285	277	265	255	240	217	110	197	159	153	147	115	108	92	78	55	50 Cape Harrigan.

Pack's Harbor to Rigolet, 55 miles.
Rigolet to Indian Harbor, 45 "

APPENDIX IV.

Abstract of Census of 1884.

Districts.	Total.	Increase	Church of England.	Increase	Roman Catholic.	Increase	Methodist.	Increase	Others.	Increase
St. John's East	21,840	4,029	5,089	1,104	13,269	2,069	2,463	625	1,019	231
St. John's West	16,297	3,534	3,207	656	10,509	1,763	2,023	935	558	180
Harbour Main	8,916	1,742	1,956	240	6,820	1,459	132	35	8	8
Port-de-Grave	8,685	766	†3,731	316	2,206	204	2 746	245	2	1
Harbour Grace	14,717	1,662	8,632	1,393	3,942	*71	1,948	333	195	7
Carbonear	6,224	736	1,029	100	2,262	73	2,920	558	13	5
Bay-de-Verds	8,403	969	430	*9	1,951	176	6,022	802		
Trinity Bay	19,005	3,328	†9,876	1,459	1,754	171	7,298	1,635	77	63
Bonavista	16,482	3,474	8.381	1,521	2,979	380	5,101	1,570	21	3
Twillingate and Fogo	20,289	5,154	6,775	*214	3,132	1,176	10,232	4,060	150	132
Ferryland	6,470	51	151	*22	6,316	70	.....	.....	3	3
Placentia	11,833	1,976	1,544	193	9.916	1,662	363	124	10	*3
Burin	8,726	1,048	1,798	165	2,684	*5	4,243	892	1	*4
Fortune	6,914	1,126	5,166	775	1,607	220	36	28	105	103
Burgeo and La Poile	6,544	1,446	5,119	903	152	27	1,265	534	8	*18
[1]St. George's and St. Barbe.	12,033	3,379	4,788	1,020	5,265	1,549	1,846	855	134	*45
Total	193,378	34,420	67,672	9,600	74,764	10,923	48,638	13,231	2,304	666
Labrador	4,211	1,789	1,974	485	566	90	305	10	1,366	1,204
Total	197,589	36,209	69,646	10.085	75,330	11,013	48,943	13.241	3,670	1,870

[1] In 1874 St. George's and St. Barbe were **not** separate districts, and, for comparison, their population is also united in the table for 1884. St. George's has a total population of 5,535, of which 3,393 is Roman Catholic, 1,878 Church of England, 147 Methodist. St. Barbe has a total population of 6,498, of which 2,910 is Church of England, 1,639 Methodist, 1,872 Roman Catholic.

*The Church of England decreased 9 in Bay-de-Verds, 214 in Twillingate and Fogo, and 22 in Ferryland. The Church of Rome decreased 71 in Harbour Grace, and 5 in Burin. † In Port-de-Grave there are 401 members of the Reformed Church, and in Trinity there are 222, and for convenience these have been included with the members of the Church of England.

APPENDIX V.

Roads, Railways, and Steam Communication.

THE colony is fairly supplied with roads, to which every year additions are made. There are at present between 700 and 800 miles of postal roads, and 1,700 miles of district roads, besides others laid out and in process of construction. The longest line of road is from St. John's to Holyrood, Salmonier, Placentia, and St. Mary's, a distance of over 100 miles.

A line of railway is at present completed, and has been running for some time between St. John's and Harbor Grace, a distance of 84 miles. It is projected to extend to Hall's Bay, the centre of the mining district.

The Allan line of steamers leaves Halifax on alternate Mondays for Liverpool, calling at St. John's, and on each alternate Tuesday leaves Liverpool for Halifax, calling at St. John's. During three months of the year these steamers run between Halifax and Liverpool without calling at St. John's, and during this time communication is kept up fortnightly by a mail steamer plying between St. John's and Halifax. During the open season excellent steamers ply between St. John's and New York; also between St. John's and Montreal, calling at Pictou, Nova Scotia, and Prince Edward Island. In addition two local steamers ply between St. John's and the settlements, north and south, carrying passengers, mails, and goods. In the summer season the steamer plying northward connects with the Labrador steamer at Battle Harbor.

APPENDIX VI.

CUSTOMS' TARIFF.

According to Revenue Act, passed 1882.

TABLE OF DUTIES.

Horses, mares, etc., each	$2 30
Pigs and calves, each	0 23
Ale, porter, cider, and perry, the gallon	0 10
Apples, the barrel	0 30
Apples (dried), the lb.	0 01
Bacon, hams, tongues, smoked beef, and sausages, the cwt.	2 00
Beef, pigsheads, feet, and hocks (salted and cured), the brl. of 200 lbs.	0 60
Biscuit and bread (not including sweet or fancy biscuits), the cwt.	0 16
Butter, the cwt.	1 12
Cut nails, 13 and 15 per cent.	
All iron for manufacture of nails	Free
Fruit—Prunes, dates, raisins, currants, and broadfigs (in frails), per lb.	0 02
Broadfigs (in boxes) the lb.	0 04
Other dried fruit not mentioned (dried apples excepted) lb.	0 04
Casks — empty, second-hand, under 45 gallons, each	0 45
Casks — empty, second-hand, over 45gallons, each	1 20
Second-hand cask staves (manufactured), capable of making casks of 45 gallons and upwards, per 100	5 00
The same, capable of making casks under 45 gallons, per 100	1 20
Cheese, the cwt.	1 50
Chocolate and cocoa, the lb.	0 04
Cigars, 5 per cent. *ad valorem*, and the M.	2 64
Coffee, the lb.	0 03
Coal, imported or brought into the port of St. John's, the ton	0 25

Confectionery, the cwt.	$3 50
Feathers and feather beds, the lb.	0 05
Flour, the barrel	0 20
Indian meal and pease, the barrel	0 15
Leather, the $100	11 00
Lumber one inch thick, and so in proportion for any greater thickness, the M.	1 00
Molasses, the gallon	0 06
Oatmeal, the barrel of 200 lbs.	0 20
Kerosene oil, the gallon	0 04
Pork, the barrel of 200 lbs.	1 00
Salt, the ton	0 20
Shingles, the M.	0 40
Spirits, viz.: Brandy and other spirits, not herein defined or enumerated, and not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon	1 60
All other spirits of greater strength than forty-three per cent. overproof shall be deemed to be undefined spirits, and be subject to duty accordingly.	
Rum, not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon	1 00
Gin, not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon	1 20
Whiskey, not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon	1 50
Cordials, shrub, and other spirits, being sweetened or mixed so that the degree of strength cannot be ascertained, the gallon	0 80
Sugar, loaf and refined, the cwt.	3 50
Sugar, unrefined, the cwt.	2 00
Sugar, bastard, the cwt.	2 50
Tea, the lb.	0 05
Timber, the ton	0 30
Tobacco — manufactured, including leaf tobacco, stripped or partly manufactured, the lb.	0 14
Tobacco, leaf and stems, the lb.	0 12½

Vinegar, the gallon	$0 10
Wines, viz.: Champagne, the gallon	2 00
Port and Madeira, the gallon	1 20
Claret, the gallon	0 30
Spanish red, Denia, Sicilian, Figueira, red Lisbon, and Cape Lisbon, common, the gallon	0 30
Malaga and Montilla, costing at port of shipment under 80 cents a gallon, the gallon	0 30
Hock, Burgundy, and light Rhenish wines, the gallon .	0 60
Malaga and Montilla, costing at port of shipment 80 cents a gallon, and any over that price, and Manzanilla and Sherry, 12½ per cent., *ad valorem*, and the gallon	0 90
All other wines 12½ per cent., *ad valorem*, and the gallon,	0 80
Fruit, other than above enumerated, fresh meat and poultry, oxen and cows, tallow and palm-oil, the $100 .	5 00
Candles, carriages and wagons; ready-made clothing, viz.: coats, jackets, trowsers, waistcoats, and south-westers; mantles, dresses, cloaks and sacks; manufactures of wood (except cabinet wares, musical instruments, agricultural implements, and packages in which dry goods are imported), the $100 .	20 00
Staves, manufactured and dressed; stockings, shirts and drawers (made by hand and not woven), the $100 .	20 00
Anchors and chain cables, copper and composition metal for ships, viz.: bar, bolt, and sheathing nails; bread-bag brin or bagging, canvas and sail cloth for ships' use; cordage, viz.: rope and hemp, coir and Manilla cables; corks and corkwood, hoop-iron, fishing-tackle, iron of all kinds, in bars, bolts, sheets, plates, and pieces; machinery and parts of machinery; masts and spars, medicines, nails, oakum, oats, rice, Indian corn, barley, bran, pitch, tar, resin, raw turpentine, sheet-tin, solder, block-tin, staves (undressed), worsted and woollen yarn of all kinds, the $100	8 00
Goods, wares, and merchandise, not otherwise enumerated, described or charged with duty in this act, and not otherwise exempt, the $100 . . .	13 00

LOCAL DISTILLATION.

Brandy, not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon .	$1 20
Gin, not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon .	1 00
Whiskey, not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon . .	1 00
Rum, not exceeding the strength of proof by Sykes' hydrometer, and so in proportion for any greater strength than the strength of proof, the gallon .	75

☞ In addition to the foregoing duties, there shall be paid 15 per cent. upon the amount payable as such duties in respect of the several articles above enumerated.

TABLE OF EXEMPTIONS.

Agricultural implements and machinery, imported by agricultural societies for the promotion of agriculture.
Arms, clothing and provisions for Her Majesty's land and sea forces.
Articles imported for religious purposes.
Paintings and statuary not intended for sale.
Articles of every description imported for the use of the Governor.
Articles for the official use of foreign consuls.
Bait, bark for tanning leather, boiler plate.
Coals, when not imported or brought into the port of St. John's.
Coin and bullion.
Coke, cotton yarn, cotton (raw).
Corn for the manufacture of brooms.
Crushing mills for mining purposes.
Donations of clothing, specially imported for distribution gratuitously by any charitable society.
Dyestuff, eggs, hemp, flax, and tow.
Hides, or pieces of hides, not tanned, curried, or dressed.
Junk, old iron, old copper, and composition metal.
Live sheep, unmanufactured wool.
Manures of all kinds.

Materials for sheathing the bottoms of vessels, such as zinc, copper, and composition metal, together with nails and paper, or felt, which may be used for or under such sheathing.
Music, written or printed.
Passengers' baggage.
Household furniture and working tools and implements used and in the use of persons arriving in the colony.
Philosophical instruments and apparatus, including globes, when imported for the use of colleges, scientific or literary societies.
Pig iron, plants, trees and shrubs.
Printed matter, not intended to be written on.
Printing presses, printing paper (royal and demy), printing types, and all other printing materials.
Printed books, pamphlets, maps, and charts.
Refuse rice, sand, seeds for agricultural societies.
Specimens illustrative of Natural History.
Sulphuric acid, when used for the manufacture of manure.
Steam-engines, boilers, and propellers.
Water-wheels and saws, when used in the original construction of steamboats built in this colony, and of mills and factories.
Twines to be used in manufacturing nets in this colony.
Wheat.
Works of art, viz.: engravings, paintings, and statuary, not intended for sale.
Vegetables of all sorts.
Fish of all kinds, and oil of the produce of fish.
Ploughs, harrows, reaping, raking, mowing, ploughing, and seed-sowing machines, to be used in this colony.

It shall not be lawful for any importer of dried fish to warehouse the same in any of the ports of this colony or its dependencies, without the payment of the duty hereinbefore imposed; and the provisions of any act of this colony with regard to the warehousing of goods on the first entry thereof, or to the allowance of drawbacks upon exportation, shall not in either case apply to or be construed to apply to such fish: Provided, that the section shall not apply to such fish of British catch and cure, unless otherwise declared by proclamation of the Governor, published in the *Royal Gazette* newspaper.

All yachts, sailing under warrant of the Lords of the Admiralty, or belonging to the Royal Yacht Club, shall be exempted, on view of the said warrant, from payment of all local duties whatsoever.

APPENDIX VII.

LATEST LAND ACTS.

SINCE the issue of the first edition of this Hand-book "An Act for the Promotion of Agriculture" was passed on the 19th May, 1886. It provides that it shall be lawful for the Governor in Council to select and set apart such areas or districts of the public lands of the Colony as may be considered suitable for agricultural purposes, and that each area or district thus set apart shall be designated an "Agricultural District."

Agricultural Districts so set apart shall be devoted to the assistance and encouragement of settlers who may be desirous of pursuing agriculture, either as a sole means of support or combined with other industrial pursuits.

Every such Agricultural District shall be blocked out into allotments or holdings of such size and arrangement as shall be considered most suitable for settlers, and provision shall be made for such lines of road and for such other public works as may be deemed desirable.

The land in each District shall be allotted by the Governor in Council to such applicants as may be approved of by him, who shall be held to be settlers under the Act, and shall be subject to such rules and regulations as shall be prescribed under the Act. In no case shall the allotment to any one settler exceed eighty acres.

For further assistance to settlers the Governor in Council shall have power to lay out and construct roads or other public works in any such District, and may employ those who may be applicants to become settlers in the construction of any such roads or works.

The work in each district to be performed shall be carried out under the control and direction of a Superintendent and Assistants, appointed by the Governor in Council, by any applicant or settler under the Act.

The expenses of the removal of any settler from his former place of residence to any Agricultural District may be defrayed by the Governor in Council, if he is considered deserving of such assistance.

Any person becoming a settler under this Act shall be entitled to receive a bonus for clearing and preparing for cultivation and fencing the land allotted to him, the sum of Twenty dollars for each of the first five acres so cleared by him, and the sum of Ten dollars for each acre cleared thereafter; the number of acres upon which a bonus shall be paid not to exceed ten acres in all.

In order to secure a good and profitable breed of cattle, sheep, or other animals, for the benefit of settlers in each district, the Governor in Council shall have power to appropriate a certain sum to procure such animals, which shall be placed under the control of the Superintendent of the District.

An amendment to this Act was passed on the 9th of May, 1888, by which it was enacted that the Governor in Council shall pay to every person who shall clear and fully prepare for cultivation any of the lands in the Colony not heretofore cleared, and not being any part of an Agricultural District, a sum of Twelve dollars per acre for every acre so cleared and prepared for cultivation, not exceeding five acres in all.

Rules and regulations are laid down for carrying into effect the provisions of this Act. Surveyors are appointed in each Electoral District of the Colony to whom persons desirous of obtaining a bonus for clearing waste land shall make application in writing: the Surveyor shall mark off the land proposed to be cleared, and on approval by the Governor in Council, a license to proceed with the work shall be granted through the Surveyor-General. The bonus becomes payable upon such land as may be cleared after the date of application, when inspected, measured, and certified by the Surveyor.

APPENDIX VII. — *Continued.*

REPORT OF THE SURVEYOR-GENERAL FOR THE YEAR 1886.

THIS Report states that in 1886, 192 Grants had been issued, containing an area of 86,014 acres, two Licenses of Occupation, containing 99 acres, and one Free Grant, containing 18 acres; also eight Location Tickets, containing an area of 752 acres, were issued.

The Act for the encouragement of clearing waste lands was likely to be largely availed of, judging by the number of inquiries made.

Mr. Howley surveyed and blocked off an area of land at the head of Exploits Bay which was considered suitable for an agricultural district. It contained 172 farm lots, of an average area of eighteen and one-quarter acres each, or a total of 3,130 acres, which are ready for occupation. The land is fairly good, and the climate favorable for agriculture. Of the whole valley of the Exploits Mr. Howley reports: "I cannot for a moment doubt that the region is destined in the future to become the home of a large and thriving population. There is no possible reason that I can see why it should not be capable of supporting many thousands of our people."

Roads were surveyed in 1886 near Brigus; the "Thornburn Road," from Freshwater, (St. John's) to Broad Cove; from Dildo to Harbor Grace Junction, and through Salmon Cove Valley, in the District of Carbonear. Most of these roads run through good agricultural land. On one of them — the "Thorburn Road" — and to the rear thereof, east and west, there were 118 applications for land, amounting to 5,085 acres.

APPENDIX VII. — *Continued.*

MINING.

COPPER mining continues to make good progress, especially since the recent advance in the price of copper ore. Little Bay Mine employs about five hundred miners, besides other laborers, and extensive smelting-works have been erected. An American Company is working a mine on Pilley's Island, of pyrites and copper ore. Tilt Cove, the earliest copper mine opened, after yielding 70,000 tons of ore, was supposed by many to be almost exhausted. Owing to the low price of ore, the workings were for some time carried on languidly, but since the late rise in the value of ore, the property has been purchased by a company for 160,000 pounds sterling, and operations on a large scale have recommenced. A new deposit of copper and iron pyrites, of extraordinary dimension, has been opened, from which 2,500 tons a month can be taken at present, and the output can be greatly increased as the vein is farther opened out. The cost of putting it on board is only two dollars and fifty cents per ton, which includes all expenses. Another very promising vein has been found two miles west of Tilt Cove. An eminent mining engineer of Tilt Cove Mine says: "It would be difficult to find a mining property in any other part of the world with such an enormous amount of mineral in sight, and I see no signs of exhaustion, notwithstanding several hundred thousand pounds' worth of ore have been already extracted."