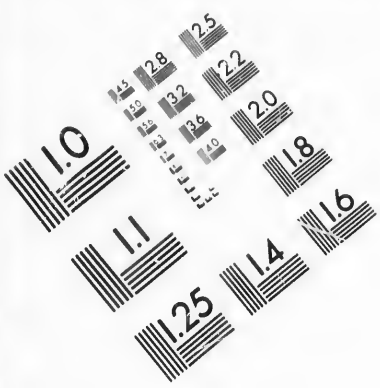

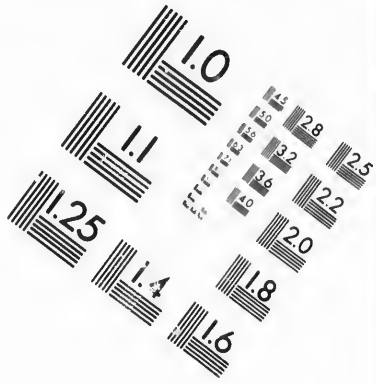

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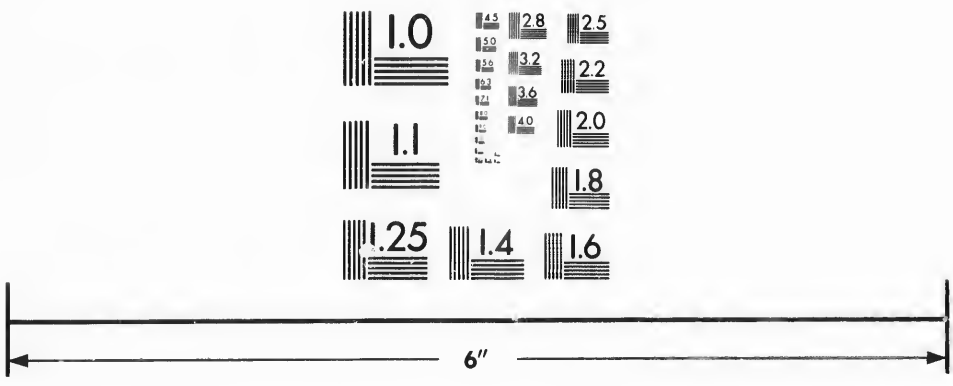

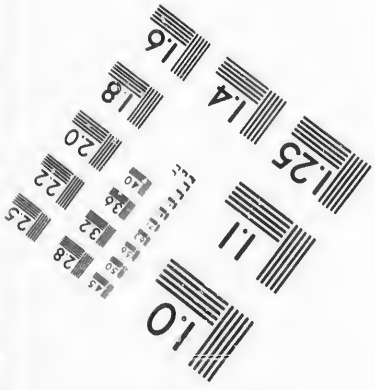

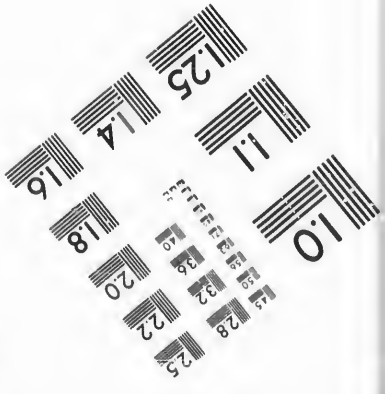

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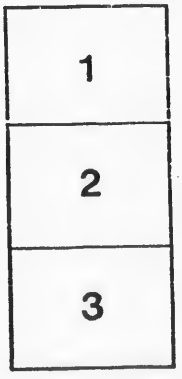

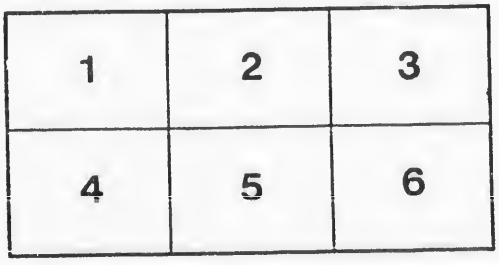

ISLAND OF ANTICOSTI.

SCIENTIFIC REPORTS

MADE BY

A. R. ROCHE, Esq.,

Before the Literary and Historical Society of Quebec,

AND

JAMES RICHARDSON,

Assistant Geological Surveyor under Sir William E. Logan, Provincial Surveyor.

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NOTES ON THE

RESOURCES AND CAPABILITIES

OF THE

ISLAND OF ANTICOSTI.

By A. R. ROCHE, Esquire.

[Read before the Literary and Historical Society of Quebec, 4th October, 1853.]

In the midst of the progress which is going on throughout British North America in reclaiming the wilderness and in seeking out and developing new sources of wealth, it is a matter of astonishment to those who observe that progress with a view to increase it where it already exists, or to introduce it where it has not begun, that no account has been taken of a valuable island, large enough to become a province of itself, lying nearly in the centre of our North American colonies, and at the threshold of the most important colony of the whole; that, while all is life and healthy activity about and beyond it, and a commerce, second hardly to the commerce of any one channel in the world, is carried past its shores, the seasons roll on without bringing to the latter any change in that state of desolation which invests it with frightful yet imaginary terrors, and which has done more to injure the reputation of the St. Lawrence navigation than all those real dangers upon the main shores of the river and gulf, where so many gallant ves-

sels have been wrecked and so many valuable lives have been destroyed.

Various circumstances have combined to give the worst character for the dangers of its coasts and for the inhospitality of its soil and climate to Anticosti, the island which it is the object of the writer of this communication to rescue from the state of neglect in which it has existed up to the present moment--a state which not only makes it useless to its proprietors and to the Province of Canada, of which it forms a part, but which renders it injurious, and to a certain extent, destructive to the best interests of the latter.

Among the circumstances which have repelled all proper inquiry and all enterprise from Anticosti, and which have done much to injure the province by giving a worse character to its great outlet than it really deserves, are the disasters from famine, which occurred there before provision posts were carefully kept up, and the opinion which has hitherto prevailed, that a greater proportion of vessels have been wrecked upon the island than have been lost in any other part of the river or gulf. Thus the mariner has been taught to regard his approach to Anticosti with intense dread, the island having having been described as presenting the greatest dangers to him when afloat, and as affording no sustenance for him if cast upon its shores. But, whatever unfavorable conclusions have been drawn from a recollection of the deaths from famine which took place there many years ago, and however far the opinion of the dangers of its coasts may have been received as a faithful one, those conclusions and that opinion have been based upon unsound foundations and been supported by erroneous comparisons, and have equally borne unjustly upon the condition and prospects of the island.

Those who, from a consideration of the former disasters, and of the few and superficial examinations which have been made along the beach, have pronounced the soil and climate of Anticosti to be unsuited to the growth of any of the fruits of the earth, have lost sight of the fact that persons cast ashore on any uninhabited place, (not situated within the tropics, or, at least, not abounding with wild and nourishing fruits,) would starve to death if left without supplies, and without the means

of removal to where they could be procured, and that, in an equal state of neglect and solitude, even England would be found as inhospitable in regard to food as Anticosti has proved to be upon one or two occasions. That the latter should be condemned upon the result of the exploration of two or three spots along the beach, is also as unjust and absurd, as if the whole of England had been declared barren and useless from an examination of a great portion of the shores of Cornwall, or from the appearance of the bleak and tree-less country in the neighborhood of Brighton. Assuming, however, that all were true which has been said of Anticosti, that its soil is incapable of producing anything in the shape of food, still, if it can be shown to contain other resources, which may be employed in industrial and commercial pursuits, and which may be exchanged, not only for food and raiment, but for all the necessaries, and even for the luxuries of civilized life, sufficient will remain to convince every intelligent and unprejudiced person, that it can be made to support, and that it will, (at the present rate of progress of British North America), probably contain, at no distant period, a considerable population. That it is not only capable of yielding food, but that it possesses natural products and resources, which may be turned to account, and be exchanged for all that can be required to sustain a population, will be presently shown, as soon as the other bugbear, the reputed dangers of its coasts, shall have been disposed of.

To those who have drawn conclusions unfavorable to the island, from the number of wrecks which have been reported to have taken place upon it, it is necessary to point out, that the wrecks, which in returns appear so formidable in the aggregate, under the head of "Anticosti," have not occurred at one spot, but at many spots widely separated, extending over a distance of 320 miles, that being the circumference of the island, and consequently the extent of coast front, not taking into account the indentations caused by bays, creeks, &c. Take the same lenth of coast upon any part of the main shores of the river or gulf, and it will be found, upon proper inquiry, that six times as many wrecks have occurred within it each year, as have for the same period taken place upon Anticosti. Instead of the wrecks upon the latter having been compared with the

number of wrecks spread over the same extent of coast on the former, they have been generally regarded as having occurred at one spot, and have been compared with those only which have happened at some one place on the main shore of the river or gulf, of a few miles, or of less than a mile in extent, lying in the course of fewer vessels, yet wrecking annually nearly as many. From an estimate, made by the writer of this communication, of disasters in the River and Gulf of St. Lawrence, during the ten years ending November, 1849, it appears that half as many wrecks occurred upon the Manicouagan shoals as took place upon the island in that period, and that Cape Rosier, Matane and Green Island each wrecked upwards of a third of the number of vessels which were stranded during the same period upon the whole of the 320 miles of the much libelled coasts of Anticosti. The Manicouagan shoals, Cape Rosier, Cape Chat, and other spots upon the main shores of the river and gulf, are places not only much more to be dreaded by the mariner than Anticosti, on account of the number of wrecks which occur upon them, but in consequence of the great loss of life which sometimes accompanies those wrecks, while, from the shelving nature of the beach at Anticosti, there are few instances recorded of wrecks upon the latter having been attended with loss of life. While the circumstantially related and carefully preserved account of the fate of the crew of the Granicus, wrecked in 1828, near Fox Bay, (who, in the course of a long winter, died from famine,) has created in the minds of many, who adopt, without reflection, any popular fallacy placed before them, a belief that every poverty of soil, every drawback of climate, and every danger of coast must belong to Anticosti, those greater dangers and those more numerous disasters upon the main shores of the St. Lawrence, attended with greater loss of life, have been almost entirely lost sight of, or if thought of in connection with the former, have been set down as unimportant, when compared with the unfairly estimated disasters and the imaginary dangers of Anticosti.

The evil reputation which still hangs over the island became attached to it many years ago, before its coasts were thoroughly surveyed, when it was laid down in the chart as being many miles shorter than it actually is, in consequence of which many

vessels ran upon it in places where deep water was supposed to exist, and before lighthouses were placed there, since the erection of which and the late survey of its coasts, wrecks upon the island have become less frequent. Most of those which now occur there, are caused by the neglect of using the lead in foggy weather, many of them through the incapacity or drunkenness of masters, who, generally, are shamefully underpaid, and some of them through design, for the purpose of cheating the underwriters. Of these latter cases the insurance offices are perfectly aware; but, instead of endeavoring to meet them by preventive measures, they increase the rates of insurance so as to cover such losses, by estimating for them in a certain proportion to the whole; thus making the entire trade pay for the dishonest acts of the rogue. This having the effect to increase the price of freight, by which the public are the sufferers, in having to pay a proportionably increased price for all articles imported, the government should in future institute a strict inquiry into the loss of every ship in the river or gulf, by means of a naval police, and be empowered to inflict punishment where criminal design, or even gross carelessness or drunkenness, may be proved to have attended such loss. Those masters who desire to lose their ships, generally select Anticosti for the purpose, because they can always manage to run them ashore there without any danger to life, and without much risk of the circumstances attending the act being witnessed or understood by persons on shore; and the provision posts being now well supplied, there is no danger, as there was formerly, of their suffering from the want of food. Thus many of the wrecks which take place there are produced in consequence of the ease with which a vessel may be beached, with safety to life, on many parts of the island, and not through its dangers of coast. In regard to the latter, those masters who know the coasts of the island well, generally make free with them, (unless there happen to be a fog,) in perfect confidence and safety, by which they gain headway much faster than by keeping in the centre of the channel, or along the south shore of the mainland. To whatever extent plausible reasons may have once given a bad name to Anticosti, there is no just reason for that name being perpetuated; and those who yet view the

island as it was regarded shortly after the wreck of the Granicus, can neither comprehend the unjust grounds upon which it was then condemned, nor appreciate the importance to every country bordering upon the St. Lawrence, of many recent events, attending the rapid progress of the trade and general prosperity which, with the exception of Anticosti, is going on in all parts of British North America. That the island should participate in that progress, it is necessary to divest it of the evil reputation through which it has been hitherto blighted; and this will be best accomplished by making known, in addition to what has been already advanced in its behalf, what it has yielded to the trifling labors of agriculture which have been attempted upon it, what its climate has been found to be by those who have resided there for many years, and what its natural resources and its important advantages of position really are.

The island lies W. N. W. by E. S. E., between the 49th and 50 parallels of North latitude, and the 61st and 65th degrees of West longitude, about four hundred and twenty miles below Quebec, three parts of it being in the gulf, through which it stretches out towards the south-west coast of Newfoundland, and the remaining part in the river, the waters at the entrance of which it divides into two channels. It contains nearly two millions of acres, being upwards of one-fourth larger than Prince Edward's Island, which is a province of itself, with its Lieutenant-Governor, its legislature and a population of eighty thousand souls. It is about one hundred and thirty miles long and thirty-five broad in its widest part, which is at the South-West Point, nearly in the centre, whence it gradually narrows to both ends, the one terminating in Heath Point, with Fox Bay lying a few miles round the point upon its northern shore, and the other end terminating in West Point, with Ellis Bay a few miles short of it, looking towards the south. Thus there is a harbor upon each side and at each extremity of the island; but Ellis Bay is better situated for the general shipping of the St. Lawrence, has greater depth of water, and is much more spacious than the other, being about two miles wide and four deep, with good anchorage. The excellent position of the island in regard to ships, commerce, &c., becomes at once

apparent, when we consider that every vessel must take either of the channels formed by Anticosti, upon entering or leaving the river, whether having passed from the Atlantic, or intending to pass to that ocean, through the Straits of Belleisle, (now coming much into use, and about to be lighted,) through the more frequented passage between Newfoundland and Cape Breton, or through the Gut of Canso, or whether running between Quebec and those portions of Canada, and of the lower Provinces, lying upon the Gulf of St. Lawrence. In taking either of the channels formed by Anticosti, vessels pass close to the island, in consequence of the moderate breadth of the northern one, and of the strong south-east current which always runs along the southern channel, to avoid which, and the risk of being driven upon the truly dangerous coast of the south shore of the gulf and river, where, for several hundred miles, there is no harbor or place of shelter for any craft larger than a schooner, and where, for long distances, there is not one foot of beach outside the perpendicular cliffs to land upon, vessels generally stand out till they make the West Point of Anticosti, close to which is situated the convenient harbor of Ellis Bay, occupying a spot nearly mid-distance between the northern and southern banks of the St. Lawrence, and of easy access from both channels of the river. Considering that about two thousand vessels from Europe alone will have made this point in the course of the present season, some slight idea may be conceived of the capabilities of position attached to the island, and in particular to Ellis Bay. The inner anchorage of this bay has a depth of from three to four fathoms at low water, with excellent holding ground, (gravel and mud,) is of as large capacity as the harbor of Montreal, and has been found, by experience, to afford perfect shelter, in all winds, to vessels of upwards of 500 tons; while the outer portion of the anchorage could be materially improved at a trifling expense, so as to be able to contain in safety, during all winds, almost any number of vessels of the largest size. Docks, with a patent slip, &c., could also be easily constructed there, which would be admirably situated for the repair of vessels, stranded or receiving other damage throughout the lower St. Lawrence, most of them becoming broken up by the action of the sea, and,

in some cases, dismantled by wreckers, before they can obtain assistance from Quebec, or the intelligence of their condition can be conveyed there; which port, strange to say, is the only place from the Atlantic to Montreal, (a distance of upwards of eight hundred miles,) where vessels can be properly overhauled, or be supplied with the commonest stores, such as anchors, chains, sails, &c. For steam tugs, employed for the relief of vessels in distress, Ellis Bay might also be made an excellent station. With the facilities there for procuring shelter for our shipping in a portion of the St. Lawrence, where a spacious and deep harbor is more wanted than in any other part of the river or gulf, it is astonishing that no attention has yet been directed to that spot. This neglect, however, cannot long continue. It could be made, not only a fine commercial harbor, but also an excellent naval station, in the most convenient and central spot for commanding, with a few steam vessels or gunboats, the two entrances of the river, and for sending out cruisers up the latter, or to any part of the gulf. And it is not impossible that the want of such an armament in our waters may be felt before the termination of the present difficulties in Europe. For the good order of those engaged in our fisheries, (whether foreigners or our own fishermen,) which, under the reciprocity treaty, will be much resorted to by the Americans, some of the most valuable of the fisheries being in the vicinity of Anticosti, the presence there of such a force would be very useful. Its influence as a check upon "wreckers," (who swarm in the St. Lawrence more than is generally supposed,) might also be enlarged upon. For these objects of commerce, of defence and of police, the fine harbor of Gaspé Basin, (situated twenty-five miles from the gulf,) is too much out of the way; besides which a fair wind for taking a ship out of it, and of its outlet Gaspé Bay, becomes a head wind, as soon as it becomes necessary to tack to come up the St. Lawrence. For the same objects, the harbors of Mingan and Seven Islands, upon the north shore of the river, are as much out of the way, and are too long closed by the ice. As for the improvements of Ellis Bay, it appears that they need be very slight to make it one of the finest harbors in British America; merely the erection of piers upon the flat limestone

reefs running out from Cape Henry and Cape Eagle, which form the entrance, these reefs being uncovered at low water, and already affording a considerable shelter to the outer anchorage of the bay. In magnitude and coast, these improvements could not be compared to what has been recently accomplished in the harbors of the Bahamas and Bermuda, by labor and science combined. Besides the advantages which have been glanced at as belonging to Ellis Bay, some of the best soil and some natural meadows, producing excellent grasses, six feet high, are found upon its shores, where the resident in charge of the provision post grows every description of vegetables; but wheat, or any other grain, has never been tried in that part of the island. It is also stated, that, within a few miles of the bay, wild hay could be cut sufficient to feed a thousand head of cattle during the winter. Nor is this spot barren in scenery; for, upon approaching it, a most pleasing view is obtained of the spacious bay, having in all parts a fine beach, which at each side is bounded by wooded cliffs, those on the east side showing tableland and other heights beyond, and at the head of the bay the beach gently rises and expands into a slight rolling country, containing forest and meadow land; the whole being relieved in the distance by two hills of moderate height, covered with trees. Near the centre of the bay, a few yards from the beach, stand the buildings, the garden and fields of the resident, close to a picturesque trout stream. When Anticosti shall be properly known and occupied, this spot will probably become the resort of many of those who now seek health or recreation at the less bracing and less interesting watering places upon the main shores of the river; and of the salubrity of the climate there can be no doubt, for all who have resided there describe it as being the most healthy place in the world. The first seigneur, (to whom it was granted in 1680 for services rendered to the crown of France,) used to reside every summer upon the island, and it is supposed that he was buried there. At this spot there are many substantial elements for the growing up of a large and flourishing town, some of which are alluded to in other parts of this communication.

For large schooners there is excellent shelter at Fox Bay,

at the north-east end of the island, and also at the South-West Point, where it is quite practicable to make a harbor of refuge for the largest ships; which would be of great use to homeward-bound vessels in the Autumn, whenever south-east winds set in, to run into and anchor, instead of being driven back for several hundred miles, and having to encounter again, under the worst circumstances, the most dangerous part of the whole navigation between the Atlantic and Quebec. There are also several good roadsteads, such as Bear Bay, situated on the north side of the island, sheltered from most winds, with good holding-ground; and there is shelter for schooners at the entrances of many of the rivers, some of which are navigable for small boats, or canoes, a considerable distance. Observation River, lying five miles west of South-West Point, has sometimes six feet of water at the entrance; and there is hardly a mile of coast on any part of the island without its stream of fresh and delicious water, many of them proceeding from lakes, one of which, at the head of Observation River, is supposed to be nearly twenty miles long and several broad. Some of the rivers have very high banks, with very beautiful falls, and excellent mill sites, and these falls have a good supply of water during the whole summer. The island on the south side generally rises from about twenty to sixty feet above the beach, (but at the entrance of Observation River it is between 200 and 300 feet high,) and is nearly level to the centre, where a range of moderate sized hills appear to run its entire length, and upon the north side to terminate in steep cliffs. It is mostly covered with a thick forest of trees, stunted near the shore, (like those upon a great part of the coasts of England and of other countries,) but which become gradually larger as they approach the interior, and are less exposed to the influence of the wind and sea. This is very remarkable upon some of the bays, where, at the exposed points, they are very small, and gradually increase in size from each side to the centre; those nearest the sea being sometimes quite white in appearance, from the salt which is thrown and crystalizes upon them. It is the stunted growth of the wood upon the sea shore which has given a coloring to the reports of those persons, who, having landed upon the beach for a few hours

only, have pronounced judgment upon the whole island from what they saw there. The trees are spruce, fir, red and white birch, ash, quantities of very fine tamarack, and, upon the north side of the island, some good sized pine. With the tamarack and pine growing there, and the immense quantities of valuable timber drifted upon the island from Quebec and other places after every easterly gale, many ships might be built every year. Like the valuable meadows for cattle and sheep, which have recently been discovered in Minnesota, in the "Far West," there are here many very fine natural meadows, producing rich grasses, five and six feet high; and in some parts there are alternate ranges of wood and open plain. On the south side of the island there are several peat bogs of some extent, and some salt marshes, caused by the overflowing of the sea at certain periods, which must tend to fertilize rather than to impoverish the land, and, near the South-West Point, there are some large salt ponds, which, were labor plentiful there, might be turned to account in the manufacture of salt: a manufacture which would become of some value to a great part of our North American fisheries, which, as well as the whole of Canada, are now supplied with salt from England or the United States, and, for curing fish and provisions, bay salt, formed from the sea and from salt ponds, is the most valuable. In consequence of there not having been a sufficient supply of salt upon the island, an immense quantity of fish, caught at Anticosti last year, had to be thrown away; and, during the present season, the fishermen at Arichat, Cape Breton, were forced to sell mackerel at from six pence to ten pence a hundred, or to see them rot upon the beach, through not having enough salt to cure them with. This latter circumstance occurred at a time when mackerel was selling at Boston for nineteen dollars a barrel. Some of the Bahama islands are retained merely on account of the salt ponds which they contain; and at Ceylon a large revenue is derived from the salt works carried on in that island. The importance of the trade in this useful article may also be understood, from the fact that two-thirds of the vessels, lately captured by England from Russia, were laden with salt. For the manufacture of this article, and for other pursuits, almost

any amount of cheap labor could be procured from Metis, and other populous places, situated upon the south shore of the St. Lawrence; but if industrial pursuits were opened out there, and land offered for sale, settlers would soon be attracted to the island. Several persons, who have been engaged there for many years in fishing and hunting, or in charge of the light-houses and provision posts, have already expressed to the writer their desire to purchase land upon it, and to combine agriculture with their present occupations; but, without any permanent interest in the soil, they have little inducement to use much exertion in clearing and cultivating it, or in attempting to improve the island in any way. It is from personal inquiry of many of these parties, as well as of others, who have resided there for many years at former periods, and from an examination of every authority relating to the island, that the writer is enabled to bring forward so many facts, in support of the views which he has adopted, in regard to its resources and capabilities.

Rearing of cattle and sheep at Anticosti, for the supply of those engaged in the fisheries, of shipping, and of the dear markets of Quebec, would, no doubt, pay very handsomely. While the natural grasses are as rich as any upon this continent, it appears that cattle can be left out to graze there longer than they can be at Quebec: a circumstance which has just been communicated to the writer by the present lessee of the island, who has at this moment several head of fine cattle of the Ayrshire breed, at the South-West Point. But if the natural grasses should not be found sufficient for numerous herds of cattle, the famous tussac grass of the Falkland Islands, which delights in a salt atmosphere, and which has been carried to the Orkney Islands, and been found to flourish there, might be introduced. At the former it grows upon peat similar to that which exists at Anticosti. The seed of this grass has already become an article of profitable export from the Falkland Islands; and the grass is found upon many parts of the coast of South America, where wild cattle abound. When we consider that remote and inclement Iceland raises her flocks and herds, her sheep numbering 500,000, her horses 60,000, and her horned cattle 40,000, and exports the finest

fleeces, also dairy and other produce, we have every reason to hope that Anticosti, situated in the midst of the fisheries, which employ many thousand men, of a vast traffic carried on by upwards of two thousand ships, and within easy approach of many valuable markets, may be made as profitable a grazing country as any portion of British North America. It was, however, at one time condemned even in this respect. Because some cows, which were taken down there some years ago, happened to die in the course of the winter, a report was immediately spread and generally believed, that cattle could not live upon the island; that there was some poisonous substance in the grass, or in the air, which must prove fatal to all cattle coming within its influence; and this belief is even entertained by many at the present moment; yet, upon proper inquiry, it appears that they died from neglect alone, having been repeatedly left for several days together without food or water. Since that period cattle have been taken down there, and been found to thrive remarkably well. At the South-West Point, both Mr. Corbet, the lessee of the island, and Mr. Pope, the lighthouse keeper, have several head of cattle, as well as pigs and poultry, all of which are in excellent condition. Of the former, Mr. Corbet says, they look better in the spring than cattle do at that season at any place upon the St. Lawrence below Quebec.

Resting upon a substratum of limestone, the soil of Anticosti should be a warm one, and if cleared to any extent, and thereby exposed to the sun, and drained where it may require drainage, it would no doubt become a productive one. For the purpose, either of drainage or of irrigation, as the one or the other may be desirable, every facility is offered by the numerous rivers and rapid streams existing in all parts of the island. The composition of the cliffs alone, some of which, according to Capt. Bayfield, R. N., contain sand, clay, and limestone, indicates that there must be good soil of considerable extent in many parts of the island, which only requires clearing and cultivation to yield very fairly; for, with these substances, and the fine mould of the vegetable deposits, which have been accumulating in the woods for ages, what better farming lands could be desired? In Prince Edward's Island, where the

ground requires to be enriched, immense quantities of limestone are imported for that purpose from Nova Scotia. Mr. M'Ewan, who resided upon Anticosti for fourteen months, in the employ of the Hudson's Bay Company, (which Company, however, as well as the late North-West Company, had no right to hunt and fish there,) mentions that the cliffs rest upon a foundation of limestone, that the second stratum is often composed of the cream colored clay, and sometimes of sand and gravel, and that the clay often reaches the top or surface, but at times is covered with a thickness of peat; the land in the latter case running into extensive plains. This peat, which produces excellent natural grasses, and also the finest vegetables, where they have been tried upon it, may be turned to many useful purposes. In Ireland a large "Peat Company" is in active operation, having a factory at Kilberry, where they supply their furnaces entirely with peat or turf, and also manufacture from it the following articles: tar, oil, paraffine, naphtha, sulphate of ammonia, charcoal and gas. A substance from which so many articles possessing powerful heating properties can be produced, it is to be hoped will some day be made to supply one great want of the present age: cheap and compact fuel for steam engines. Enough, however, has been shown to prove that, instead of its presence at certain spots at Anticosti being considered as any drawback, the peat which is found there may be regarded as a valuable resource of the island; for what is now being accomplished with it in Ireland, may at some future period be attempted with it at the former.

Of the interior of Anticosti, Mr. Corbet, who has resided at the South-west Point for ten years, and who, in his various excursions, has seen more of the island than any other person, describes the soil to consist generally of "black light soil, clay and sand," and states that, "from the immense quantities of sea-weed with which the shores abound, he believes the land could be made to yield every description of farm produce. In the same statement he refers to what he and Mr. Pope have accomplished at the South-west Point. The writer had, however, obtained a similar statement from the son of Mr. Pope last autumn. At this spot, which Lieut. Baddeley, R. E., who visited it in 1831, declared to be the most barren and uninvit-

ing in the whole island, Mr. Pope grew last year the finest crop of oats, 300 bushels of the best potatoes, (the potato disease never having reached the island,) and every other vegetable in perfection which is grown in Canada; and this he did upon a patch of land adjoining the bleak point where the lighthouse stands, where the soil consists of a description of black peat resting upon the limestone. Mr. Pope supposes, though he has never tried it, that wheat might be successfully cultivated in the interior, which has never been explored beyond ten or twelve miles from the beach, along the banks of some of the rivers, and then generally by hunters or fishermen; parties not likely to look for or to care about agricultural resources. How much, therefore, must still remain to be explored in an island 130 miles long by nearly 40 broad! But so long as oats and other produce raised there can obtain the present high prices in the Quebec and other markets, it will be of very little consequence whether wheat, which can now be purchased in Canada for less than an equal quantity of oats, will succeed there or not. Yet there are many persons ready to condemn, as utterly unfruitful and worthless, any place which could not number wheat among its productions. Of vegetables, Mr. Pope could have disposed of any quantity to ships bound to Quebec, which are often becalmed off South-west Point after a month or six weeks' voyage, with a prospect of being nearly another month in reaching their destination. The supplying ships under these circumstances, especially when conveying cabin passengers and emigrants, may become a very profitable occupation to the settler. Vegetables, meat, fish, soft bread, &c., could be easily taken off to vessels in boats, as they are at Portsmouth, Yarmouth, and a number of other ports in England, under circumstances far less favorable, by bum-boats, the owners of which realize immense profits.

The statements made by Mr. Corbet and Mr. Pope regarding the island, have since been confirmed by accounts received from several other parties, who have been engaged there in hunting and fishing at various periods during the last fifteen years, some of whom are still employed there. But not only do the present and the recent residents speak well of the island, but the accounts of those who have passed considerable periods

upon it many years ago are equally favorable. Mr. Morrison, a person well known in Quebec, who, (having been previously employed at Anticosti by the North-West Company,) was sent there about fifty years since, to explore a portion of the island for the purpose of forming a settlement, after mentioning in his report the excellency of the soil, and the timber which he found there, including ash, large pine and tamarack, says: "I had a house erected on the south side of the island, around which we made a clearance, and sowed wheat, barley, and oats, all of which grew very luxuriantly and ripened. Vegetables and garden stuffs of every description grew remarkably well, and came to as great perfection as any I have seen in Canada. There is very good clay on the island, of which I made some bricks, and built an oven, and whilst there I imported some cattle from Nova Scotia, and found that they throve well." Why the explorations and labors of Mr. Morrison led to no result at that time is thus explained in his statement, made in 1842, to the present proprietors of the island: "After I returned to Quebec and made my report, Mr. Grant, the then proprietor of the largest portion of Anticosti, at once came to the determination of settling it, and offered to me the superintendence. During the winter of 1804, I engaged by his directions eighteen men, intending to proceed with them to Anticosti in the spring, and to immediately set about cutting a road across the island; but, unfortunately, Mr. Grant died about that time, and the intention which had been entertained of colonizing the island was abandoned, a circumstance much to be regretted." Many statements, equally favorable as to the agricultural capabilities of the island, made by parties, whose residence there for considerable periods should give them some pretension to a real knowledge of its worth, in that and in other respects, might be quoted; but sufficient has been given, to convince every reasonable mind, that the island is not the utterly barren and miserable place which so many, who have merely touched there, or have sighted it at a distance, have declared it to be. If it were what the latter would wish to make it appear, those who have resided for any time upon the island, would certainly not combine to speak well of it, and

express a desire to continue there; nor would many of them have voluntarily made it their abode for ten or fifteen years.

While the accounts of these parties generally agree as to the timber and the nature of the soil, they represent the climate to be milder than that of Quebec. Mr. Wright, a surveyor, who wintered there in 1765, during what he then considered a very severe season, shows, by his observations taken there, that the thermometer only fell as low as 15 degrees below zero, and both Mr. Corbet and Mr. Pope informed the writer, that the winter before last there were only six weeks of sea ice in the neighborhood of the island. This mildness of climate when compared to that of Quebec, and of the opposite shores of the St. Lawrence, is easily accounted for by its insular position; the island being surrounded on all sides by a wide expanse of salt water, the modifying effects of which upon climate in all parts of the world, even where the width of sea may be less than a mile, is well known to all who have ever considered the many influences which will bear upon climate, irrespective of latitude. The island lying nearly east and west, and having highlands running its entire length along its northern shore, much of its surface must be protected by the latter from the coldest winds, and, even among the range of highlands, there must be many green and sheltered valleys and slopes with a southern and western aspect. In regard to degree of heat and cold, its climate is much like that of Newfoundland; but it is not so subject to fogs. The navigation at the former is open for about six weeks or two months longer than it is at Quebec, and it is probable that, with properly constructed and properly manned steamboats, or with Lieut. Halket's boats, (so favorably spoken of by Lieut. Osborne, Captain M'Clure, and other Arctic navigators,) a communication between the South-West Point and the south shore of the St. Lawrence could be effected occasionally in the winter months, according to the weather and the state of the ice, which never extends across or blocks up the whole channel. The experience of recent, as well as of former Arctic navigation, should convince us of the practicability of the undertaking. A communication, during that period, could certainly be often kept up from the island with Mingan on the north shore of the river. When the island shall have

advanced so far as to make the establishment of a winter communication with the main shore of importance, it would be advisable to employ for the purpose men who have served in some of our Arctic searching ships, or have belonged to some of the Greenland or Davis' Straits' whalers, who could also be employed in the valuable whale and seal fisheries, which exist upon both sides of the island. In smooth weather a few of the enterprising, skilful and industrious Esquimaux would easily accomplish it in their *oomiaks*, and they would at that season be the best seal hunters which could be procured. And no natives of this continent are so susceptible of being civilized as these brave and estimable people. This is fully proved by the accounts of the abilities displayed by, and the gallant and devoted conduct of those who became interpreters to, our several Arctic expeditions. Many men have obtained a monument to their worth, who did not deserve one more than Augustus, the invaluable Esquimaux interpreter to Franklin in his first and second expeditions; who, in an attempt to reach and assist Back in a third expedition, gave up his life rather than fail in his voluntary mission, after his companions, in dismay at the dangers encountered, had turned back to Fort Churchill, on Hudson's Bay. If a people, numbering many such as Augustus among them, could be planted in a civilized state upon the north shore of the St. Lawrence, whence many of them were cruelly driven two centuries ago, and be employed in connection with Anticosti, many humane as well as useful and profitable objects would be accomplished by the settlement of the island. To return, however, to the difficulties which ice presents to the navigation of the St. Lawrence. Were the vessels in the Quebec trade constructed with a view to having to navigate a sea occasionally encumbered with ice, and were they commanded by men, who had made one or two voyages in a northern whaler, we should seldom hear of a shipwreck in the ice, consequent upon an early winter setting in, or upon an unusually late arrival of the spring: two events which have recently happened, and, together, have caused the loss of upwards of one hundred ships. Upon being beset by the ice last November, many masters of vessels, finding themselves in a difficulty which was quite novel to them, and for which they

were entirely unprepared, became perfectly bewildered, and left their ships unnecessarily, while others immediately cast anchor, which was the worst step they could have taken under the circumstances, the drifting ice cutting the resisting vessels entirely through. Though the writer has made many inquiries, he has not been able to discover more than a very small proportion of officers or men, employed in this trade, who have ever made a voyage in a northern whaler.

It is now time to notice those resources belonging to Anticosti, which, being wholly independent of soil and climate, may be turned to immediate account. These resources principally consist of its sea and river fisheries, which, although comparatively neglected by Canada, may be classed among the most valuable fisheries of British North America.

In the recent report, published by the New Brunswick Government upon the fisheries of that province, mention is made of the valuable whale and cod fisheries existing upon the coasts of Anticosti; and it is stated that the Jersey houses fit out vessels to carry on the former upon both sides of the island, and up the St. Lawrence as far as Bic, some of the whales, ("hump backs,") being seventy feet long, and yielding eight tons of oil; while the fishermen of Gaspé frequently resort to the east end of the island and take cod in great abundance. In his work entitled "Newfoundland in 1842," Sir Richard Bonnycastle states, that "the whale fishery is pursued along the coast of Labrador, in and through the Straits of Bellcisle" (close to Anticosti,) "and that whales of all sizes are taken, from the smallest finner to the largest *mysticetus*, or great common oil whale of the Northern Ocean, which occasionally visits these regions." It thus appears by these authorities, that on every side of Anticosti valuable whales abound; the pursuit of which, and of seals and cod, it is not improbable, could be carried on in winter as well as in summer, were the attempt to be properly made; but, without a trial, the undertaking may ever remain unjustly condemned as impossible. Should such an attempt be successful, it would not be the first instance of that being accomplished upon trial which theory, timidity and prejudice had long declared to be impracticable. Here, again, the experience of our northern fishermen, and of the Esquimaux,

who fearlessly encounter all difficulties and dangers, of the ice and of the weather, and who fish in winter and summer, might be successfully brought to bear.

Of cod, Mr. Corbet, in his statement made to the writer, remarks that "one boat, with two good fishermen, could take off South-West Point, or at Fox Bay, eighteen hundred of these fish in one day;" while Mr. Morrison states that cod, halibut, and a variety of other fish, could be caught all round the island in incalculable quantities, and that no finer cod is caught on any part of the coast of America, or on the banks of Newfoundland, than is to be met with there. To this may be added the testimony of Captain Fair, R. N., of H. M. ship Champion, who states that he met a few shallops from the Magdalen Islands, at the east end of Anticosti, where they found cod in great abundance and of excellent quality.

Of hardly less value than the former is the seal fishery, which could certainly be carried on in winter as well as in summer, many seals being seen on the ice during the former season and in the spring, and thousands of them being observed during the summer and autumn, at the entrances of all the bays and rivers, where they remain almost entirely unmolested. To show the value of this fishery in the gulf, the New Brunswick official report, already cited, brings forward an instance of a schooner engaged in it from Sydney, Cape Breton, having cleared £14,000, within three weeks of her having left that port. Yet at Anticosti, where seals abound more than in most parts of the gulf, this fishery is at present almost entirely neglected; the Americans and others, who resort to its neighborhood, being principally engrossed with the still more profitable cod and mackerel fisheries. For the storing and preservation of seal, whale and cod oil, the temperate degree of heat at Anticosti during the summer is particularly favorable.

At the present moment the mackerel fishery is the most lucrative one in the St. Lawrence, and is the most extensively pursued, mackerel now selling at Boston for nineteen dollars a barrel, and at Halifax and Quebec for a few dollars less than that sum. No part of the gulf abounds with this fish more than the neighborhood of Anticosti. Many schooners visit the coasts of the latter from the United States, the Lower Prov-

inces, and a few from Gaspé, to carry on this fishery, in which they are very successful; and Mr. Corbet states that the mackerel he has seen in July and August come in shoals so thick and so close to the shore, that as many as one hundred barrels could be taken in one haul of the net. A few hours' work will thus sometimes pay the whole expenses of a schooner during the season.

Herrings as fine as any in the world, are as plentiful about the island as mackerel; but from the wretched manner in which they are cured, they obtain a much less price in the market, and are, therefore, comparatively neglected by the fishermen. To make this fishery as valuable as the former, a few of the Dutch North Sea fishermen should be engaged, who would introduce their mode of curing the fish, which has long obtained for "Dutch Herrings," the highest price in every market in Europe. By adopting that mode, the Scotch fishermen are beginning to compete successfully with the former.

At the entrances of all the rivers and creeks immense quantities of lobsters are thrown up by the sea; the collection of which, and the preserving them on the spot for distant markets, or sending them fresh in vessels containing wells, to our home markets, might render this fishery a very profitable one. Eels are also very numerous and very fine, and are often collected by parties of Indians, who come over for the purpose from Mingan, and who obtain a high price for them from the Americans. Some of the halibut, which are found off the coast, attain the weight of three or four hundred pounds.

The caplin, which are now merely used as bait for cod, are so abundant around the island that they are sometimes thrown up by the sea and cover the shore to the depth of two feet. Were they properly cured and exported, they would find good markets in Europe, or oil of an excellent quality could be made from them by the simple process of boiling.

The number of schooners which resort to the shores of Anticosti from the United States, the Lower Provinces, and the Magdalen Islands, in pursuit of the cod and mackerel, is so great, that there are sometimes as many as one hundred vessels fishing between the East Point and Fox Bay at one time, all of which are generally very successful. If these fisheries can

be so profitable to expensively fitted out schooners, (of from 40 to 150 tons,) some of which come a distance of fifteen hundred miles, and have to bring every supply, including provisions and salt with them, how much more profitable would they become to parties residing upon the island, who would have their supplies upon the spot, and who could carry on their operations in boats. How important also to the latter would become the trade which might be created with the former: the supplying them with provisions, often with fishing gear, and with every description of marine stores; and how soon would such a trade lead to more extensive transactions, in regard to the purchase of fish upon the spot, and the disposal of it in the best markets, and to a further trade in West India, South American and Mediterranean produce, obtained in exchange for fish, and being in great demand in Canada. It might also lead to the gradual rise, at different points of the island, of good sized villages, and ultimately of towns. Many large towns in various parts of the world, which are now places of great wealth, have risen from elements quite as slight as these. Even the frozen shores of Spitzbergen may be pointed out, as having been, for upwards of a century, the site of a flourishing settlement, supported by the Dutch whale fishery alone. Of this settlement of Smeerinberg on the island of Amsterdam, N. W. coast of Spitzbergen, Scoresby, in his "Arctic Regions," thus speaks: "Such, indeed, was the bustle produced by the yearly visitation of 200 or 300 vessels, that the place had the appearance of a commercial or manufacturing town; and of such consideration was this village, that the incitement of an advantageous traffic drew a number of annual settlers to the place, for the purpose of vending such stores as brandy, wine, tobacco and other commodities in constant demand. Not only shopkeepers, but bakers and other artizans resorted thither. Thus the naturally barren and desolate shores of Spitzbergen were made to assume the appearance of a populous country; and such was the flourishing state of Smeerinberg, that it was compared by the Hollanders with their famous settlement of Batavia, which was founded about the same time." But we need not confine ourselves to the past for examples as to what the enterprise and energy of man, properly directed, may ac-

complish in places the most inhospitable, or as to the advantages of carrying the fisheries on from stations planted in their immediate vicinity, the intelligence having this moment reached us of the extraordinary success which has already attended the efforts of the gallant Arctic voyager, Capt. Penny, to establish a permanent whale fishing settlement upon the bleak shores of Davis' Straits.

Shore-whaling has been very successful at New Zealand, and may be made so at Anticosti, around which whales are so numerous that they are sometimes found stranded upon the beach. While the men engaged in the pursuit would be able to devote the whole of their time, from the first opening to the latest period of the season, to the capture of the whale, (towing each one ashore as soon as caught,) their families could be employed in cutting up the blubber, extracting and storing the oil, preparing the whalebone, &c.; so that no useful portion of the animal would be lost, and the capture of the greatest number of whales would be insured. The parties on shore could likewise be employed in making casks and other articles used in the "try houses" for boiling the blubber. Under the usual system many opportunities of a capture are lost, in proceeding to and returning from the fishery, and much time is wasted in the extracting, stowing and disposal of the oil, while much that would be valuable, were it preserved, is thrown overboard, and a good deal of oil is lost by leakage. In regard to the fisheries generally, the advantage of being able to cure the fish upon shore, in proper houses, instead of curing them carelessly on board, must be apparent to every one. What add to the value of Anticosti as a fishing station, are the numerous creeks and rivers, affording perfect shelter for boats and schooners, with a fine beach to land upon, which are found on both sides of the island.

So long, however, as distant fisheries can be carried on with a profit, there can be no reason why Canada should not participate in the latter, as well as in the former, should she, with her large and increasing resources for successfully embarking in any undertaking, begin to evince that spirit of enterprise which led the earlier colonists of the neighbouring States, to fit out vessels for the pursuit of the most distant whale fish-

eries, as well as to carry on in boats that which existed upon their own shores. Anticosti, where there is excellent accommodation for any number of vessels of from 300 to 400 tons burden, (the size mentioned by Scoresby as best adapted for the Greenland and Davis Straits' fisheries,) might eventually be made, in regard to the great southern, as well as to the great northern fisheries, such a station for the fitting out of whalers, and for the exportation of their produce, as Nantucket and New Bedford have long been for the fitting out, and the reception, of the whalers of the United States.

Of the river and lake fisheries of Anticosti, Mr. Corbet, who leases them, as well as the right of hunting the whole island, but who keeps up a very small establishment, and consequently makes use of his privilege to a very slight extent, says: "I have frequently, along with two Indians, taken in the month of July, in one day, twelve hundred salmon-trout, and upwards of two hundred salmon, out of Observation River, near the South-West Point, the majority of the salmon-trout weighing four pounds, and the salmon from twelve to fifteen pounds;" and Mr. Morrison states, that the first day he went up to Salmon River, he caught, in a very short time, with a small net, from two hundred to three hundred fine salmon; and that, too, by confining his fishing to only two or three of the numerous holes to which salmon resort in that river. Even in winter, Mr. Corbet has caught quantities of fine trout, by cutting a hole in the ice, and fishing with a hook. This gentleman owns a schooner, in which he sends the produce of the fisheries and of the chase, obtained by him, to the Quebec market, where it commands a high price. The master of this schooner is one of many parties who are desirous of purchasing land, and settling entirely upon the island, with which he has been connected for fifteen years.

Though all the rivers of Anticosti abound with the finest salmon, few of them are fished to any extent, in consequence of there being but a small number of persons residing upon the island, and those who come there not being prepared, and not having the right to fish in the rivers; which, with sufficient attention and judicious management, might be made almost as valuable as the best salmon rivers in Scotland, for each of

which a rent is obtained of from five to fifteen thousand pounds sterling per annum. The markets for fish in the United States, being about to be thrown open to Canada, under the Reciprocity Treaty, will soon become quite as remunerative as any in Europe, and will consequently raise the value of our river fisheries to what is obtained for the most valuable of the former.

The porpoise fishery, which is successfully conducted at Tadousac, at the entrance of the Saguenay—each porpoise caught being worth £25, in the leather and oil which it is made to yield—might also be carried on at Anticosti at a considerable profit, the latter being as well situated for the purpose as the former.

The hunting upon the island is of considerable value, though of far less importance than its fisheries. The animals consist of black bears, martens, otters, and the silver grey, the red the black, and sometimes the white fox; all of which are very numerous, and for the skins of which Mr. Corbet realizes excellent prices in the Quebec market; those of the silver grey and the black fox fetching from £15 to £20 each. But Quebec being principally a mart for other and dearer markets, much higher prices would be obtained for the Anticosti furs, could they be sent to the latter markets direct; and this would be easily effected, were the settlements and establishments, contemplated in this article, made upon the island, which would create objects there of sufficient importance to attract vessels from various parts to its shores. The bears upon the island are quite harmless, and, living upon the rich berries and wild fruits, such as currants and gooseberries, which abound everywhere in the summer and autumn, are very good eating during those seasons. Deer were formerly met with, but have not been recently seen there. Fortunately, the island, like the country immediately north of Quebec, (though they abound still further north,) is entirely free from wolves. There are mice, but neither rats nor frogs; nor are there snakes or reptiles of any description.

Great quantities of ducks, geese, partridges, and other fowl resort to the lakes upon the island, some of which are of a species peculiar to England; and a duck, called the *muniac*, remains about the shore all the winter. It is probable that

the eider-duck, which frequents the main shore further north, will be found there; in which case eider-down might be made a profitable export from the island.

Thus, even in respect to food, Anticosti, in an uncultivated state, is not so inhospitable as it is generally supposed to be; for, with its fish, its bears' flesh, and its fowl in abundance, what active sportsman is there who could not often obtain a meal there, with his rod or with his gun?

With so many other resources, it is of little consequence whether or not Anticosti will be found to possess valuable minerals. There is no account of its ever having been visited by a geologist; but iron ore of great richness and quartz are frequently met with on the island, and recently some substances have been discovered resembling mineral paints. Plumbago may also exist there, as it has been found among limestone of a similar character to that of the island upon several parts of this continent; and Mr. M'Ewan mentions having found freestone there, some of it as fine as water of Ayr-stone, and some as coarse as grindstone. The fossiliferous limestone, which exists in great quantities upon the shores in thick horizontal strata, is of so fine a grain and color, and so hard, that it is most deservedly classed under the head of marble. Were this marble quarried to any extent, large profits could be made by disposing of it to builders in the chief towns of the province, whose wealthy inhabitants are beginning to vie with each other in the beauty of their residences, and the style of their living. To Quebec and Montreal it could easily be conveyed as ballast. Being very durable, as well as very beautiful, there is little doubt that, were it brought to those cities, in any quantities, it would be selected for many public buildings. The contemplated erections for the Government and the Parliament Houses could not be made more imposing in appearance, so far as the material is considered, than by the use of this marble in their construction. It has already been used for several lighthouses in the St. Lawrence besides those upon the island. Both Lieut. Baddeley, R. E., who touched at several parts of the island in 1831, and Sir Richard Bonnycastle, R. E., who landed at the entrance of Jupiter river in 1841, speak of the value of this marble. The former says, "its structure is crystalline, and its

consequent lustre upon fracture is high; it is sufficiently hard to receive a good polish, and is sufficiently solid and massive to turn out some excellent ashlars, so that, whether it be desired for the construction of a house or for its interior embellishment, it is equally applicable." Sir Richard Bonnycastle states, "the limestone cuts well, and looks very beautiful, being, in fact, a sort of marble;" and adds, "I procured some large and valuable encrinital remains, yellow blende, and some fine white marble, and have no doubt that a rich treat would be afforded to the collector who had leisure sufficient in this vicinage." A specimen of a stone, suitable to the purposes of lithography, found upon the island some years ago, was placed in the museum of this society, and many specimens of iron ore, quartz, marble, and curious fossils, have been obtained there upon various occasions. Anticosti having been evidently formed at the same period as the rest of North America, and not having been created by the alluvial deposits of the St. Lawrence, as, from its position, some might suppose, there is no reason, upon its being explored by a geologist, why some of those minerals and ores should not be found there, which are known to exist upon this continent. It is only very recently that coal, silver, and copper have been discovered upon the western coast of Newfoundland, among a limestone formation similar to that of Anticosti.

Taken separately, the resources of Anticosti, as they are yet known, may not appear so important as those of countries more favored by careful attention, by settlement, and by a fair expenditure upon them of labor and science combined, under which their resources have been partially developed; but, viewed together, they cannot but be regarded, by any unprejudiced observer, as of considerable value, and as giving promise, (upon the introduction there of those agencies which have been successfully at work elsewhere,) of becoming a source of wealth and prosperity to the whole province. No comprehensive view of the resources and capabilities of the island having ever been taken, is one reason why it has been so long neglected; and why, throughout its three thousand three hundred square miles of territory, it yet gives shelter to no more than some fifteen or twenty residents, distributed between the fishing stations of

the lessee, the lighthouses and the provision posts, all of which are situated upon the south side of the island; the fishing stations being at the South-West Point, and the entrances of Observation and *Beesecie* Rivers, the lighthouses at the East Point and the South-West Point, and the provision posts being also at the lighthouse stations, at Shallop Creek, about half way between them, and at Ellis Bay. The state of desolation in which the island remains, is shown by the necessity for keeping up these provision posts for shipwrecked sailors, as, in former days, wells were dug, shady trees planted, and caravansaries maintained in the desert, for the relief of pilgrims and travellers by the Arab and Indian princes; but, unlike the deserts of the East, (though even there fertile spots have been often discovered and been made to "bloom as a rose,") Anticosti has hitherto been condemned to desolation, not on account of its being incapable of being made to sustain a population, but because of the superficial examinations of its soil, bordering upon the sea shore only, which have been made from time to time, and of the reports and general rumors, based upon those examinations, similar to those unjust popular rumors which have for many years kept back many other countries, since become known and now arrived at a flourishing condition, and which, until the last few years, condemned Newfoundland to be a mere fishing station. Even Prince Edward's Island, now the garden of our maritime provinces, was for a long period kept back by prejudices as absurd and unjust as those which long operated against the progress of Nova Scotia and Newfoundland, and which, up to the present time, have rendered Anticosti worse than useless; a terror to the mariner, and an inhospitable wilderness at the threshhold of the province, frowing upon, and depressing in spirit, all who seek Canada by the route of the St. Lawrence.*

* As there are few persons in England, or even in Canada, who do not still regard Newfoundland as possessing no resources beyond its fisheries, and who look upon Nova Scotia almost in the same light, the following extract is inserted here from the speech of Mr. Morrison, at the meeting of the Agricultural Society, held at St. Johns, Newfoundland, in 1842, and presided over by Sir John Harvey, as bearing upon the past condition and the recent progress of those countries, and upon the present state and what may be the future progress of Anticosti: "Travels, voyages, histories, geographies, even

Should properly conducted and sufficiently extended explorations be made at Anticosti, and commensurate exertions be expended upon it, results will be produced there, similar to those which have followed proper inquiry into and proper efforts for developing the resources of Nova Scotia and Newfoundland; a fair proportion of good as well as bad land will be discovered; the former will be made to yield every description of grain and vegetables which can be successfully grown in those countries, and to raise any number of cattle and sheep; while the entire island will be made to export, in addition to furs and fish, oil, tallow, tar, potash, dairy produce, and the finest ice from its lakes and rivers, and to support a large and a thriving population of fishermen, mechanics, traders and agriculturalists. But what the writer conceives to give more value to Anticosti, than its capabilities of soil and climate, or its

school books, in which the name of Newfoundland is introduced, represent the soil so barren, the climate so severe, as if nature had raised an impassable barrier to its agricultural improvement. Little more than twenty-five years ago the same prejudice that had been the bane of Newfoundland prevailed in Nova Scotia. The possibility of raising wheat, barley, and other grain for the subsistence of the inhabitants, was ridiculed and scouted as chimerical. Fortunately there was one among them of experience in the improved system of Scottish agriculture, who roused the people by his appeals, led them to form agricultural societies, under the operations of which the insane prejudice that had so long existed against the soil and climate of Nova Scotia became dispelled; and in the history of no country has there ever been recorded a more radical and instantaneous change than has been witnessed in that country. So in Newfoundland, by following the example of Nova Scotia, lands have already been cleared and cultivated in many parts, north and south; a great portion of the subsistence of the inhabitants is now raised from the soil, and at a moderate calculation made from the statistical returns in the last census, the agricultural produce of the island is little short of two hundred thousand pounds per annum. Some of the farms, at St. Mary's and Placentia Bays, have thirty, forty and fifty head of horned cattle." Besides many other authorities to the same effect, Sir Richard Bonnycastle may be quoted, who, in his work upon Newfoundland, says: "Wheat is growing within a mile of the house I am writing in. It was sown in the fall of the year, and in this month of April has survived all the severe alterations of the winter. The poorest soil of Newfoundland is around St. Johns, yet wheat grows there. On the western side of Newfoundland," [opposite to Anticosti], "the climate is less severe; the land more rich in consequence of limestone prevailing, and is now known to be quite as capable of cultivation as Cape Breton, Prince Edward's Island, and Nova Scotia. Even the East coast might be made to support its own population."

many other resources, whether belonging to the sea, to the rivers, or to the land, is its position at the entrance of the St. Lawrence, in the direct and only channel of an immense traffic, which, within a very short period, is certain to become vastly increased, not only by the throwing open to the Americans, of the navigation of the St. Lawrence, under the reciprocity treaty, recently concluded, but also by the extension of the trade of the province to all parts of the world. Whether viewed with regard to this future trade, or to the existing maritime trade of the province, which is confined to England, the United States, the Lower Provinces and the West Indies; to the establishment of an *entrepôt* in the direct channel of that trade, and of a coaling station for the three lines of steamships about to run between England and Quebec; or viewed as affording the most favorable points for establishing fishing stations, and of settlements and villages for supplying the fishermen belonging to the island, as well as those who will be attracted to its coast fisheries from a distance, and who will be desirous to rent certain portions of the shore for the purpose of drying their fish there; the position of Anticosti, is a most admirable one, and if the island were composed of nothing but rock, without soil sufficient to produce a blade of grass, its position alone would render it capable of being made of more value than the most favored island in point of soil and climate not possessing the advantages of that position. In regard, either to an entrepôt, or a depôt for coals, Ellis Bay offers a most convenient site for every vessel, whether taking the north or the south channel at the entrance of the river; and having a depth of 21 feet at low water in its most sheltered part, (secure in all winds,) and having no bar, the fine steamers employed in running between England and Quebec, which only draw from 13 to 17 feet water, could enter and lay there at all times. Depôts for coals might also be established at the South-West Point, where there is a depth of 4 and 5 fathoms of water close to the shore; and at Bear Bay on the north-east side of the island, which is an excellent roadstead, with good anchorage. The latter points are nearly five hundred miles nearer to England than Quebec is; which is about the distance steamers have to make when getting short of coals upon the voyage from

Europe; and several instances have already occurred of their having to run a considerable distance out of their way to procure coals at a cost of two or three days' delay, when, could they have obtained them at Anticosti, they need not have lost more than a few hours. For these depôts, coals could be easily brought from Pictou and Cape Breton, or be purchased from ships carrying them from England as part of their cargoes to Quebec. Thus the furnishing coal for the steamers touching at Anticosti would, of itself, create a considerable traffic with the island. These steamers could also take some of the produce of the fisheries, &c., obtained there.

By establishing an entrepôt on the island, for the purpose of carrying on some of the traffic between Canada and Europe in the early spring, when for several weeks an intercourse between it and Quebec could be frequently kept up in small vessels, before ships from sea can traverse the same space, and later in the autumn, after every ship from the latter has left for Europe, six weeks or two months would be virtually added to the period of open navigation at Quebec. While such an intercourse by colonial schooners or small steamers, (for which there is shelter almost everywhere,) could be maintained at those seasons, ships from sea could arrive earlier at, and depart later from Anticosti, than they can arrive at or depart from Quebec, and those ships that might choose to discharge and obtain their cargoes at other periods at Anticosti, could easily make three voyages instead of two. By doing so, they would avoid the worst part of the present voyage, (from Cape Rosier to Quebec,) would secure six weeks or two months more of open navigation, and, in the three voyages, would save two thousand five hundred miles. Vessels also, which, coming out late in the autumn, are sometimes obliged, after reaching the gulf, to run back to ports in the Lower Provinces, and winter there, having to continue their voyage on to Quebec in the spring, would avoid the loss of about six months, by being able to unload and obtain a cargo at Anticosti. Although the Baltic can be navigated by the largest ships, yet the trade of that sea is generally carried on by small vessels, in consequence of the dangers which exist there to the former; and, so in the gulf and river St. Lawrence, there are an immense number of small craft

employed in all parts, and at the earliest and latest periods, among which we seldom hear of a wreck occurring, while, year after year, numerous Quebec traders, (of from 500 to 2,000 tons burden,) are cast ashore in the river this side of Anticosti, before reaching it, or after having passed it in safety, and an immense amount of property is destroyed. The comparative immunity from disaster of the former is to be attributed to the intimate knowledge of the navigation of the gulf and river possessed by masters of colonial vessels, constantly employed in the same waters, in addition to their vessels being adapted for taking shelter in the numerous rivers and creeks, which exist along the coasts both of the river and gulf, where, for long distances, large vessels can obtain no safe anchorage. Only last summer a Liverpool vessel for Quebec was driven from her anchors at Bic, which is considered to be about the best anchorage in the river, and was stranded upon Rimouski. It cannot, therefore, but be allowed, that it might be advantageous to employ, to some extent, small colonial craft within the river for such commodities as they could conveniently carry. Among the exports from the Province, they could easily take deals and boards, staves, pot and peart ashes, flour and grain of all descriptions, pork, fish and furs, &c., and, with the exception of machinery and railroad iron, all articles of import landed at Anticosti could be as easily brought by them to Quebec. This would partly upset the present system, and perhaps be unpopular with the merchants of Quebec; but many ship-owners and ship-masters, with several of whom the writer has conversed upon the subject, would be highly in favor of it, and would never send a ship to Quebec whenever she could obtain a cargo at Anticosti. And if underwriters and shippers, here and in England, could be shown that goods conveyed in this manner would not be liable to one-tenth the risks to which they are now exposed; that not one-tenth of the present number of wrecks would occur, and that, at a moderate cost, harbors fit for the largest trade could be made at Ellis Bay and the South-West Point, they also would gladly lend their aid to carry out such an arrangement. As for the proprietors of the island, they, no doubt, would most readily give their assistance to that which would make their property worth

in the market twenty times its present value there. Thus by combining the interests and the means of many, (who, as yet, have no knowledge that their interests may be made identical,) towards establishing such a system of commercial intercourse as that which has been pointed out, the undertaking might be accomplished, notwithstanding any difficulties which other parties might oppose to it. It would not depend upon whether the latter would favor it or not, but whether those, having an interest in carrying it out, could, by organization, by economy of management, and by steadiness of purpose, place and maintain a sufficient quantity of well selected articles upon the island, and be able to dispose of them at about the same rate as that at which they would be sold in the markets to which they might properly belong. For the intercolonial trade of the St. Lawrence, the island might be made a convenient centre, from whence the whole of it could be easily carried on.

Besides the main trade of the province, conducted from Quebec, the trade of the flourishing settlements up the Saguenay towards Lake St. John, which are rapidly extending, may be made to contribute to the importance of Anticosti; the whole of those settlements being then supplied by the latter, as well as many of the extensive and populous settlements along the main shores of the lower St. Lawrence. At a future period a further trade by the Saguenay may be looked for, coming across from the St. Maurice, from the Upper Ottawa and from Lake Huron, through a magnificent country, which will rapidly become occupied, whose commerce will seek the nearest outlet to Europe; and, whenever a railroad shall be constructed, to connect the Saguenay with Lake Huron, much of the trade of the "Far West" will come the same route. Ultimately such a road will become a branch of the great railway which is at no distant period to cross this continent to the Pacific. Instead of assisting to divert the trade of Canada to channels passing through the United States, by which we lose the value of one-half the traffic before it reaches the ocean, and our ships lose the whole of the freight to Europe, it would be much more beneficial to the province, if our leading merchants would encourage the use of routes passing through our own territory to the Atlantic.

Anticosti may also grow into importance as an emporium for a portion of that commerce which Canada is now in a position to open out with all parts of the world; for, to large vessels coming long voyages from the East Indies, China, &c., it would be of some consequence to avoid the delay and the dangers of coming up the St. Lawrence. The island may then almost become such a mart as the ancient Taprobana, (the Ceylon of the present day,) was in regard to the trade between China, India, the Persian Gulf, Arabia and Africa, when "she received and dismissed the fleets of the East and of the West;" her position alone enabling her to extract more wealth from that trade than was derived from it by the countries to which it properly belonged.

Since the foregoing was written, the writer has visited the island which he has endeavored to represent as it appeared to him, after an examination and a comparison of every authority bearing upon it, and an inquiry into its present condition, of nearly every person now residing, or who has lately resided there. He will now, therefore, add the result of his own observations, made upon the spot.

Having taken passage at Quebec about the middle of July in the steamer "Wilmington," which was sent to Anticosti with the object of assisting a ship, wrecked last November about twelve miles from Ellis Bay, (which had remained there ever since, almost uninjured by the ice or storms of an unusually severe winter,) he visited that Bay as well as the South-West Point three times, and was upon the south side of the island for about three weeks. He also twice visited Gaspé Basin. At Ellis Bay the steamer ran in for shelter upon each occasion, and upon the last remained there for three days. She anchored about two miles up the harbor in $3\frac{1}{2}$ fathoms at low water, about a mile distant from the shore upon either side, and a mile and a half from the head of the bay, which appeared to be, from point to point, (Cape Henry to Cape Eagle,) from eight to nine miles round. Upon looking out from this position towards the sea, every appearance of the most complete security was presented, the limestone reefs from the two points stretching out south-east and south-west towards each other, the one a

mile, the other three quarters of a mile in length, and forming complete breakwaters, quite uncovered at low water, and which, being covered to only a very slight depth at any time, stop the force of the sea even at high water, as was indicated by the surf which they then caused, as the waves broke upon them, and which clearly directs ships to the channel between them, of six hundred fathoms wide. This channel, too, is much protected by the water shoaling immediately outside to six fathoms, which, although deep enough to admit the largest vessels, tends to break the force of the sea. This was experienced upon one occasion, when, in a heavy southerly gale, the steamer ran in from a tremendous sea outside, in which she pitched nearly bowsprit under, and anchored in water almost as smooth as a mill pond. To all on board the almost sudden cessation of violent motion appeared as extraordinary as it proved agreeable. The same afternoon a large American schooner ran into the bay for shelter, and anchored nearly a mile outside the Wilmington in perfect safety, where she remained till the gale abated the following morning. During the several periods the steamer lay in this harbor, heavy winds were experienced from every quarter, yet she rode through all as calmly as if she had been moored in front of Quebec; and in the spot where she was anchored, nothing less than such a hurricane as would cast vessels adrift and sink them, either in the harbor of Quebec, or in the Liverpool docks, could effect a vessel there. Mr. Gamache, who has resided for twenty-five years at the provision post at this bay, informed the writer that the harbor was perfectly secure in all winds, and at all periods, that, besides other vessels, the "Sir Richard Jackson," of about 600 tons burthen, had twice lain there for several months each time, and that her Captain had said it was as safe a harbor as any he had ever entered. Mr. Gamache has, himself, built two vessels there of a considerable size. A gentleman on board the Wilmington, a member of Lloyds, who had come out from England, and had chartered the steamer to proceed to the wreck at the island, and who had been three times round the world as Captain of an East India Company's ship, declared that he considered the harbor "a most excellent one;" so much so, that he should on his return to England make

it specially known at Lloyds. But, as some persons, who have never been in Ellis Bay, or have not been there when there were heavy seas outside, imagine that it must be exposed to southerly winds, the following extract is given from the log of the Wilmington, which should convince them of their conclusion in this respect being an erroneous one: "Monday, 2d August, 1854. It looking very wild and bleak to south-west, with heavy rain and quick flashing lightning and thunder, proceeded direct to Ellis Bay. It then blowing strong from south-south-east with rain and sea rolling in with a thick fog, kept the lead going, and went along the coast in sight of breakers, seeing them when we could not see the land. Made out Cape Eagle by 9 A.M., rounded its armed, (protecting,) reef, sounded up the bay, and came to with both anchors by 9.40 A. M.—3 P. M., wind south, blowing strong and about right up the bay. We ride smoothly and safe. Coming in between the reefs there is a swell, which might make a stranger fear the safety of his ship, but as you run up the bay, it becomes less, and at anchorage smooth riding and good holding ground." This, and the fact of a sailing vessel having run in for shelter the same afternoon, when the wind had increased in violence, not only show the safety of the harbor during the worst winds, (and as the steamer made for it upon this occasion, Captain Rudolph and his officers exclaimed that its security would be well tested in such weather,) but they also prove how easy it is of access under the worst circumstances: a strong southerly wind blowing directly in, a heavy sea outside, and a thick fog. Though, the latter apparently continued out at sea, when once in the bay, there was only a slight haze perceived. The thickest fog, however, encountered during the cruise, was in coming up the river, from Metis to Green Island. At Anticosti, although there were occasional fogs, it was often clear enough to see across to the south shore, a distance of forty miles. Much might be added here, in favor of Ellis Bay, as a harbor, but the fact of such vessels as the "Sir Richard Jackson" having been repeatedly there in all weathers, without any of them having been cast ashore, or having dragged their anchors, should be sufficient. No instance has ever occurred of a craft of any description having dragged her anchors, or been injured there

in any way; and Captain Rudolph stated that the Wilmington would have ridden just as safely with a single anchor as with two. As the underwriter on board, belonging to Lloyds, remarked, there are many places in England, and other countries, carrying on a large maritime commerce, which have not so spacious, so deep, or so safe a harbor as Ellis Bay.

The appearance of the shores of this bay has been already pretty accurately described. They are generally thickly wooded with spruce trees, of a better growth than those near the sea upon other parts of the island, and on the higher ground in the distance, a good many hard wood trees were seen of a still larger size. A conspicuous and picturesque clump of birch trees stood out from the spruce close to the shore, one of which the writer measured five feet from the ground, where he found it to be five feet in circumference, its height appearing to the eye to be almost sixty feet. The five substantial buildings of the resident are very prettily placed near one of the three or four fine trout streams, which flow into the bay, where he has several acres cleared and divided by excellent fences, and where he had growing, and looking remarkably healthy, every description of vegetables, and some fine timothy grass. The potatoes there were looking more advanced than they were at Quebec, when the steamer left the latter place a few days previously. The soil, though not very deep, appeared to be very good, consisting of a dark loam, with sand and gravel below; and there is little doubt that it could easily be made to produce some of the hardier grains; to ripen which, or even wheat, there must be quite sufficient heat, the thermometer upon one or two occasions during the Wilmington's stay there being as high as 81° in the shade, and 105° in the sun, and at no time going lower than between 50° and 60° during the three weeks the steamer continued in the neighborhood of the island. Round the bay many beautiful wild flowers were seen; also the sarsaparilla plant and the sweet pea; and on the beach, the writer picked up a piece of sponge, which had been detached from the bottom by the action of the sea. The salmon-trout in the river, near the resident's house, were so numerous that they might almost have been caught by the hand as they moved in shoals from one part to another, upon being disturbed by

the sailors, who attempted to take them with buckets. Quantities were obtained and found to be delicious eating. A number of very fine salmon were also purchased of the resident, whose assistant happened to enter the bay with fifty he had just caught in the *Becscie* River, in the course of about an hour; and several large lobsters were taken in the bay, and sent on board. But what appeared of extraordinary interest to those in the steamer, was the sight every day, when the tide was out, of some three or four hundred seals sleeping or playing round the bay, generally entirely out of, but near the water, and some of them occasionally swimming close to the vessel, whose round heads looked very much like those of a human being. One of them, the resident mentioned, he had killed, a short time previously, upon the step of his door. The bay must therefore be a favorite resort of theirs. A great many whales, at least fifty, were also seen between the island and Gaspé, and several between the former and Bic, each of which must have been worth from £200 to £400; yet only one vessel was met with, or heard of, in pursuit of them: a large schooner from Gaspé. Both the whale and seal fisheries could be carried on much more conveniently from Ellis Bay than from the former or from any other place within the gulf. With this sheltered spot everybody on board the steamer was much pleased: from the excellency of its harbor, the inviting appearance of the country around it, and the objects of interest which were met there; and even the sailors expressed a desire to take up their abode upon its shores. One sailor, who had belonged to a vessel wrecked upon the island last November, and who had wintered there, became so charmed with the place, that he had already become a permanent resident, employing himself in fishing and hunting; and the captain and the whole crew of a ship, that went ashore in a fog about eight miles from Ellis Bay, when the steamer was in the harbor, informed the writer that if they could obtain land there, they would send to Hull, whence they had sailed, for their families, and settle on the island in a body.

At the south-west Point, where the steamer could have run close up to the shore, and been moored to the flat limestone rocks, which form complete natural wharves, the five or six

buildings, including a very large stage and store-house for fish, were so disposed near the magnificent lighthouse, which towers above all, as to present quite the appearance of a villiage. Upon landing, this appearance was rather heightened than diminished, as a number of fine fields, neatly divided by straight fences, in which were growing very luxuriantly many vegetables and grasses, came in view, and a horse and four fine cows, all in excellent condition, were seen feeding upon a common close by. Added to these indications of civilized life, were a number of fowls in all directions among the houses, and several fat pigs venturing further back to rob the bears of the rich berries and wild fruits which abounded there. Near to the landing place two persons were employed in cutting up a huge shark, which had just been caught, having, no doubt, been enticed out of his usual latitude by the shoals of fish which proceed from the Atlantic towards the island. The same day immense quantities of mackerel were seen close under the point upon which the lighthouse stands. By their praiseworthy exertions, Mr. Pope and his son have shown what may be accomplished by well directed industry in places apparently the most unpromising; for this spot must be about the bleakest upon the whole island, being completely exposed to the north-west winds. Last year they grew most excellent oats, and next year they purpose to grow both oats and barley, seed for the latter of which the writer has just sent to them. Some of their potatoes of last year, of the few they had remaining, which the writer brought to Quebec, weighed three to the pound, and some of this year's growth, taken out of the ground on the 5th September, and sent to the writer, are of a still larger size, and of an equally fine description. If there were a few more industrious and intelligent settlers upon the island, like Mr. Pope and his family, who are the most deserving people that could be met with, it would soon obtain a very different character, in regard both to climate and soil, than has hitherto been accorded to it. The first frost which appeared this year at the South-west Point, Mr. Pope, in a letter to the writer, says, took place on the 27th August, but was not sufficient to do the slightest injury to his potatoes: at Quebec the tops of the potatoes were blackened by frost about the same time. The soil at the South-west Point

has been already described; but the writer penetrated about two miles into the woods there, where he found the soil very similar to that in many parts of Canada in the original forest, deep with vegetable deposits, without stones or a particle of rock to be perceived. At Gaspé, with a less genial soil and climate, the writer saw several fields of excellent wheat. The trees which, near the sea at the point, were about a foot high and spread out their tops like mushrooms, improved gradually, but rapidly, as he entered the woods, and at a distance of a mile back were sixty or seventy feet high. This alone would indicate the existence of large and valuable timber in the interior; but he was informed by all whom he saw on the island that quantities of such timber were to be met with in many parts. A number of pieces of particularly fine grained tamarack he saw piled up with some other wood near the light-house; and the firewood which the steamer procured both at the South-west Point and at Ellis Bay, proved to be much better than that obtained at Gaspé, or at any part of the south shore of the St. Lawrence where the steamer took in fuel. After being three times in the bay at the South-west Point, and examining the greater portion of it, and after having been caught in a north-west gale there, which obliged the steamer to run out to sea, the Captain of the Wilmington, who has a good knowledge of the construction of harbors of refuge, and who proved himself to be a thorough seaman upon several trying occasions, declared that, at an expense of £2,000, he could build a breakwater upon the reefs running out from the point, which would render the bay a secure shelter in all winds for the largest vessels. A harbor could also, probably, be made at Salt Lake Bay, about eight miles further to the east. As at Ellis Bay, many wild flowers and fruits and the sarsaparilla plant were met with at the South-west Point; also a plant resembling the cotton plant, and the reindeer moss. The cranberries, which are very numerous in certain parts of the island, might be made profitable exports, as they are at the Magdalen Islands, and Prince Edward's Island, whence many barrels are sent to the United States, where they are eagerly purchased. At the present time cranberries are selling in Montreal for 12s. a bushel. Mr. Pope mentioned that Admiral Coffin touched at

the South-west Point in the early part of the summer, and after making many inquiries about the island, said that it could be made to produce anything which can be grown in Canada. The finest clay soil, however, appears to be found upon the banks of Observation River, (the scenery at the entrance of which was very beautiful, as viewed from the steamer as she passed,) and also on the north side of the island, where there are many spots among the hills, sheltered entirely from easterly and north-west winds; those parts having been pointed out to the writer by persons acquainted with them, as containing the richest soil of that description on the island, so far as it is yet known. But it is very evident that not one-tenth of the island has ever been explored, or even traversed, the hunters and fishermen, and others who have ever been upon it having confined their excursions to the sea shore and the principal rivers, hardly ever venturing any distance back from the latter. Like all countries, Anticosti must contain much bad land as well as good, and the former might be supposed to prevail along the shore, where, in some parts, there are quaking bogs, like those of Ireland, (which, however, may be drained and be turned into the richest soil,) and a good deal of rock; but, whether the good or the bad land predominate to any extent throughout the island, there can be no means of ascertaining, without a thorough survey of the interior. That much good land, besides those fertile spots which have been pointed out, by the various parties referred to in this communication, is likely to be discovered by such a survey, the writer is now enabled to show upon one of the highest authorities existing upon this continent, namely, that of Professor J. Hall, Palæontologist of the New York State geological survey, and author of the "Palæontology of New York," who, having examined a number of fossils brought from Anticosti by the writer, among which he discovered a new species, described them in writing, and added the following lines as to the conclusions which may be drawn in regard to the island from their presence there: "The specimens indicate the occurrence of limestone beds with alternations of shale, and the decomposition of these will furnish a productive soil in consequence of the abundance of calcareous matter." These specimens, and some others, which they had

not time to properly examine at the moment, both Professor Hall, and our own talented and indefatigable geologist, Mr. Logan, considered so interesting, that they expressed themselves strongly to the writer upon the importance of the Government undertaking a thorough geological survey of the island, with the object of making discoveries there which would give it an economic value. A specimen of the marble brought from the island obtained the first prize at the recent Provincial exhibition held at Quebec.

As Anticosti belongs to a number of persons, some of them residing in Canada and others in England, who are not likely to combine in any comprehensive plan for developing its resources, but who would no doubt be prepared to dispose of their interest in it at a reasonable price, it is to be desired that, either the Government, or some public company in Canada, or England, or one belonging to both countries, should purchase the island, and expend sufficient means, which the present proprietors could not afford, in turning its resources to account. Of the two, a company, which could enter into the several undertakings glanced at in this communication, would be the more suitable for the purpose; but the field may be made to embrace so many and such varied objects, that it could well give employment to several distinct companies. There might then be a colonization company, a fishing company, and a commercial company; the first purchasing the whole island, and selling, or leasing to the others, those portions of the coast at which the operations of the latter could be most conveniently carried on. A thorough survey, however, of the whole island might be well undertaken by the Government in the mean time; for, although it belongs to private individuals, it is of the highest public importance, for many reasons, which must suggest themselves in the course of this communication, that the island should not be allowed to continue in its present state of desolation; besides which, every large addition made to the inhabited seaboard of the St. Lawrence, must materially increase the commerce, the shipping, and the wealth of the province.

GEOLOGICAL SURVEY OF CANADA.

REPORT FOR THE YEAR 1856,

OF

MR. JAMES RICHARDSON, EXPLORER,

ADDRESSED TO

SIR WILLIAM E. LOGAN, PROVINCIAL GEOLOGIST.

MONTREAL, 1*st March*, 1857.

SIR,

Agreeably to the instructions received from you in June last to proceed to the Island of Anticosti, the Mingan Islands, and the Magdalen River, for the purpose of obtaining information regarding their geology, I left Montreal on the last day of the month, and embarked with my assistant, provisions and field equipment, the following day at Quebec, on board of a schooner which reached the west end of Anticosti on the 6th of July.

Through the prompt attention of Mr. Larue, who kindly supplied me with horses and carts, I was at once enabled to land our materials, which without his aid it would have been necessary to carry in single pieces from the boats to the shore, for a quarter of a mile through the surf, with much loss of time and risk of injury; and I may take this opportunity of stating that I was on several subsequent occasions indebted to him for his attention and assistance.

Not being able to induce the captain of the schooner which carried me to the island to convey me to Mingan, where it was my intention to procure men, I was obliged to remain

where I had landed for a few days, until another schooner for passage over and back was procured. While instituting inquiries at Mingan about men, I had an opportunity of making a partial examination of Harbour Island, Large Island, and one point of Mingan Island; and having obtained a boat and two men, with little prospect of obtaining more, the Indians having left for the interior previous to my arrival, we left Mingan on the 16th, and got back to the west end of Anticosti two days after.

While the men were preparing our boat, and re-arranging our provisions for an excursion round the island, I commenced the work of the season by a careful record of the rocks in the neighborhood, ascertaining the thickness by actual measurement where exposed, and by computation where concealed. When practicable, collections of fossils were made, and their stratagraphical and geographical positions recorded.

On the 23d July I left the west end, the men proceeding with the boat and provisions to Gamache or Ellis Bay, while I followed on foot; at Gamache Bay I was able to procure a small boat, which was of great advantage in facilitating my work, and by means of it I was enabled to examine the coast and collect specimens all the way to South-west Point, while I was obliged to allow the men to bring on the larger boat with provisions as best they could.

At South-west Point, finding the two men I had engaged at Mingan not suitable for our work, I freed them from their engagement, and hired four others who had two boats of their own, which I also hired, leaving our own boat at South-west Point; I was induced to do this from the consideration that in case of danger the men would be likely to make a greater effort to save their own boats than mine, and in consequence save what was in them. One of these boats was devoted to the carriage of specimens, and the other of provisions and camp equipage.

On the 14th August we left South-west Point, and I continued my examination to the east end of the island, and then along the north coast, keeping always in company with the larger boats, with the exception of ten days at Chaloupe River, where the larger boats were detained from head winds

and storms; while with the small boat and two men I examined the east end of the island, a distance of nearly fifty miles.

Considering on our arrival at Charleton Point, on the 12th September, that the larger boats would no longer be so much required, I sent them on to the west end, where they arrived on the 14th, while I followed and examined the coast with the small one, getting to the same place eight days later. A few days were spent in examining the rocks in that neighborhood, and making measurements with Rochon's micrometer telescope, so as to determine more minutely the thicknesses of the strata.

But few excursions were made into the interior of the island; they consisted of one at Otter River, for about two miles up; another in the neighborhood of South-west Point, to the distance of a mile and a half; a third at Salmon River, for five miles inland; another at Nugg River; and a fifth by Mr. Easton, my assistant, to Marl Lake, three-quarters of a mile.

On the 30th September we left the island in the steamer Doris, for Quebec, with forty boxes and barrels of fossils, and the provisions intended for the survey of the Magdalen River, as well as our camp equipage, making sixty parcels in all, in addition to our small boat. We reached Quebec on the 4th October, and on my arrival at Montreal, on the 7th, on account of the lateness of the season, you recommended the postponement of the survey of the Magdalen River.

On my tour of the coast of Anticosti, I met with much attention and personal kindness from all the officers in charge of the government lighthouses and provision stations. I have great pleasure in having an opportunity of expressing how much I am obliged to Mr. Pope, in charge of South-west Point lighthouse, and to his son, Mr. E. Pope, for the interest they evinced in forwarding the objects of my investigation, and in supplying me with information respecting my excursion round the island, as well as the care his whole family displayed in supplying me with comforts, at the time otherwise beyond my reach. I am indebted to Mr. Corbet, the lessee of the island, and to Mr. Braddley, of Chaloupe River, for their attention; as well as to Mr. E. Julyan and his family, of Heath Point, in supplying my wants on my arrival there without provisions,

my boat having been detained for nearly a week after my arrival, by contrary winds and storms.

In searching for hands to aid me in my work, some difficulty was experienced to procure men acquainted with the coast, notwithstanding that considerable wages were offered; I found none that had been round any considerable portion of the north side, and an opinion appeared to prevail among such as had been for years on the island, in regard to that part, that was anything but encouraging. They seemed to be under the same delusion respecting the north-east coast of Anticosti, that those at a greater distance are in respect to the whole of it.

Since my return I have had an opportunity of reading an article on the resources and capabilities of the island, by Mr. Roche, published in the Transactions of the Literary and Historical Society of Quebec, in 1855; and in so far as I am enabled to judge, find it a correct and unexaggerated statement of facts.

Character of the Country and Coast.

A great part of the coast has a belt of reefs that are dry at low water, while they are covered according to the state of the tide at various depths at high water. The outer edge of these reefs forms a precipice, according to Bayfield, of twenty, fifty and even a hundred feet; they occasionally shelve a little, but generally so little that vessels approaching the coast have but small intimation of danger from soundings.

These reefs are composed of the argillaceous limestone of the island, and extend out from the shore usually from a quarter of a mile to a mile; and in one or two instances to about a mile and a half. They conform to the bends of the coast, and where bays occur, deep water may be expected to within a quarter or half a mile of the head of the bay, in a line up the centre, usually at about right angles to the general run of the coast.

From the west end, the reefs are continuous on the south side to St. Mary's River, for about six miles to the east of which deep water prevails close in shore; from this the reefs again extend to South-west Point, with the exception of a mile

before reaching it, and a mile on each side of Jupiter River. From South-west Point they run about four miles to the east, beyond which, to Iron River, only a few points were observed where reefs existed; but from Iron River to Heath Point, and for two miles north-east of it, they are very general. On the north side, deep water prevails close in towards the beach, as far as Observation Bay; but from Observation Bay to the west end, reefs are well marked, with the exception of about a mile, rounding North Point.

On the reefs it is not uncommon to meet with boulders, but great distances may be seen without them; where they occur it is generally in considerable numbers, covering patches of from one or two acres up to half a mile; they are oftener seen in the bays than in less sheltered places; but North Point would be an exception to this; they are there closely packed together for about half a mile, and some of them are of a large size; they belong to the Laurentian series of rocks.

The south side of the island, in its general aspect, is low; the most elevated points close on this coast are at the mouth of Jupiter River, where cliffs rise on the east side to the height of from eighty to a hundred feet; and on the west side to a hundred and fifty feet. On no other part of the south coast were they observed to rise more than from thirty to sixty feet, but the general height above the sea is from ten to twenty feet.

From South-west Point to the west end, the hills inland are more elevated than they are to the eastward; in general they rise gradually and more continuously from the shore, attaining the height of from a hundred and fifty to two hundred and fifty feet, at about the distance of from one to three miles. From this however are to be excepted certain localities on the coast, where plains are met with having a superficial area of from a hundred to a thousand acres underlaid by peat, partly bare of vegetation, but over considerable spaces, supporting a heavy growth of wild grass from four to five feet high.

From a position a few miles east of South-west Point to Wreck Bay, which is at the east end of the island, between Heath Point and East Point, the elevation of the coast above high water is from seven to fifteen feet, with the exception of

the neighborhood of South Point and Cormorant Point, which rise to the height of from twenty to thirty feet on the shore; but very little rise takes place inland for from one to three miles, and this flat surface is bounded to the north by a gradual slope, rising to the height of from one hundred to two hundred feet, probably becoming more elevated still further inland. The low country is a succession of peat plains, occasionally bare, but often covered with wild grass; the whole being varied with strips and clumps of trees, as well as dotted with small lakes, on which ducks, geese, and other wild fowl breed in considerable numbers.

The whole of the north side of the island is a succession of ridge-like elevations of from 200 to 500 feet above the sea, separated by depressions. From English Head, three miles east from the west end to West Cliff, a distance of fifty-eight miles in a straight line, each successive ridge and valley occupies a breadth of from four to six miles; the ridges form a somewhat rounded end, facing the sea on the north; their rise is first well marked at from a quarter of a mile to a mile from the shore, and in about a mile more inland they attain their greatest elevation; continuing this elevation to the south and widening, they narrow the intermediate valley, until, as far as known, the country becomes in appearance of a gently undulating character. The run of the valleys with some exceptions is from S. 10° W. to S. 30° W.

Macastey Ridge or Mountain, eleven miles east from the west end, rises upwards of four hundred feet at about a mile inland. High Cliff, eighteen miles further east, is probably 500 feet, one quarter of a mile from the shore; these are in some respects the most conspicuous ridges. High Cliff is a bold head-land, while Macastey Mountain is separated by a broader valley than usual from its neighbor to the east, and is higher than any other to the west. Macastey Mountain is a conspicuous object when viewed even from the south side of the island, in the neighborhood of Ellis, or Gamache Bay; sailing up this natural harbor, it is observed in front, a little to the right, about five or six miles distant.

The succession of ridge and valley, from English Head all the way to West Cliff, is regular and characteristic, and produces a pleasing and beautiful effect. From West Cliff to Observation Bay, a distance of about twenty miles, there is a similar succession, but on this part the ridges rise to their full elevation nearer to the shore. West Cliff rises immediately over the sea to an elevation of between 200 and 400 feet. Charleton Point has an elevation of 100 feet over the sea, and a quarter of a mile inland rises to between 300 and 400 feet: from Charleton Point to Observation Bay the coast is somewhat lower, Observation Bay forming an indentation on the coast of a mile and a quarter deep, and five miles across; from the head of this bay a well marked valley bears S. 10° W.

From Observation Bay to Gull Cape, a distance of fifty-three miles, the cliffs become more prominent on the coast, rising almost perpendicularly at the points to the height of from 100 to 300 feet; and the indentations are more numerous, producing more sharply defined valleys.

Between Bear Head and Cape Robert, a distance of five miles and a half, the greatest indentation from a straight line is about a mile and a half; but this is subdivided into Easton Bay, Tower Bay, and White Bay, the last being the largest.

Salmon River Bay, East from Cape Henry, is five miles wide, and its greatest depth is one mile. Salmon River runs through a well marked valley, of which the general bearing upstream is S. 65° W. for nearly six miles, where a transverse valley, in the bearing N. 77° W. and S. 77° E. (about parallel with the coast) meets it, and gives it two streams running from opposite directions. From the middle of the valley the land gradually rises on each side to the height of from 400 to 450 feet, and the bed of the valley must rise pretty fast; for though the current of the stream is without leaps, it is rather rapid.

Prinsta Bay, further east, is an indentation of about one mile in depth, with a width of a mile and a half; perpendicular cliffs surround this bay to the height of from 100 to 150 feet, except at the very head, where two creeks cut through the rock. On the west side of Prinsta Bay is Cape James, 150 feet in height; and on the east is Table Head. Table Head

has a face of from 150 to 160 feet perpendicular, and gains almost at once an additional height, from the summit of which there is a gradual descent on the opposite side, the surface forming on that side a rough outline to the valley through which Fox River passes to Fox Bay, which affords the second important harbor on the island. The upward course of the valley of the Fox River is N. 72° W.

From Fox Point on the west side of the bay to Gull Cape, upwards of a mile on the east side, there is a distance of six miles, in which the coast is low—Fox Point, the highest part of this, not being more than from thirty to forty feet above the sea.

From Gull Cape to Wreck Bay, a distance of eleven miles, the cliffs are in general perpendicular, and from 100 to 130 feet high, gaining but little elevation inland, probably not over 100 feet, while the surface back from them gives, as far as observed, a slightly rolling country.

Excepting the valley of Jupiter River, there are no well defined valleys on the south side of the island.

In respect to the soil of the island, the plains on the south side, as has been stated, are composed of peat, but the general vegetation of the country is supported by a drift composed for the most part of a calcareous clay, and a light grey or brown colored sand. The elements of the soil would lead to the conclusion of its being a good one; but the opinion of most persons, guided by the rules derived from the description of timber which grows on it, would not be favorable, as there is almost a complete absence, as far as my observation went, of the hard-wood trees, supposed to be the sure indication of a good settling country.

The most abundant tree is spruce, in size varying from eight to eighteen inches in diameter, and from forty to eighty feet in length. On the north coast, and in some parts of the south, it is found of good size in the open woods close by the beach, without any intervening space of stunted growth; the stunted growth was occasionally met with on the north side, but it is only on the tops of cliffs, and other places exposed to the sweep of the heavy coast winds, where spruce, or any other tree on the island, is stunted. In these situations there is

oftentimes a low, dense, and almost impenetrable barrier of stunted spruce, of from ten to twenty feet across, and rarely exceeding a hundred feet; beyond which open woods and good, comparatively large, timber prevails.

Pine was observed in the valley of the Salmon River, about four miles inland, where ten or twelve trees that were measured gave from twelve to twenty inches in diameter at the base, with heights varying from sixty to eighty feet. White and yellow birch are common in sizes from a few inches to two feet in diameter at the base, and from twenty to fifty feet high. Balsam-fir was seen, but it was small and not abundant. Tamarack was observed, but it was likewise small and scarce. One of our men, however, who is a hunter on the island, informed me he had seen groves of this timber north from Ellis or Gamache Bay, of which some of the trees were three feet in diameter, and over a hundred feet in height. Poplar was met with in groves, close to the beach, on the north side of the island.

Of fruit-bearing trees and shrubs, the mountain-ash, or rowan, was the largest; it was most abundant in the interior, but appeared to be of the largest size close on the beach, especially on the north side, where it attains the height of forty feet, with long extending and somewhat slender branches, covered with clusters of fruit. The high cranberry *(Viburnum opulus)* produces a large and juicy fruit, and is abundant. A species of gooseberry bush of from two to three feet high is met with in the woods, but appears to thrive best close to the shingle, on the beach, where strips of two or three yards across and half a mile long were occasionally covered with it; the fruit is very good and resembles in taste the garden berry; it is smooth and black colored, and about the size of a common marble; the shrub appeared to be very prolific. Red and black currants are likewise abundant; there appear to be two kinds of each, in one of which the berry is smooth, resembling both in taste and appearance that of the garden, the other rough and prickly, with a bitter taste.

Strawberries are found near the beach; in size and flavor they are but little inferior to the garden fruit; they are most abundant among the grass in the openings, and their season is

from the middle of July to the end of August. Five or six other kinds of fruit-bearing plants were observed, some of which might be found of value. The low cranberry was seen in one or two places in some abundance, but I was informed that it was less abundant than in many other past seasons. The raspberry was rarely met with.

The most surprising part of the natural vegetation was a species of pea which was found on the beach, and in open spaces in the woods; on the beach the plant, like the ordinary cultivated field-pea, often covered spaces from a quarter of an acre to an acre in extent; the stem and the leaf were large, and the pea sufficiently so to be gathered for use; the straw, when required, is cut and cured for feed for cattle and horses during the winter.

But little is yet known of the agricultural capabilities of the island; the only attempts at cultivation that have been made are at Gamache Bay, South-west Point and Heath Point. South-west Point and Heath Point are two of the most exposed places in the island; and Gamache Bay, though a sheltered position, has a peat soil; the whole three are thus unfavorable.

On the 22d July potatoes were well advanced and in healthy condition at Gamache Bay; but a field under hay, consisting of timothy, clover and natural grass, did not show a heavy crop. At South-west Point, Mr. Pope had about three acres of potatoes planted in rows three feet apart; he informed me he expected a yield of 600 bushels, and at the time of my arrival on the 5th of August, the plants were in full blossom, and covered the ground thoroughly; judging from the appearance they seemed the finest patch of potatoes I had ever seen. About half an acre of barley was at the time commencing to ripen; it stood about four feet high, with strong stalk and well filled ear. I observed oats in an adjoining patch; these had been late sown, being intended for winter feed for cattle; their appearance indicated a large yield.

On the day of my arrival at Heath Point, the 23d August, I accompanied Mr. Julyan about a mile from the lighthouse, to a piece of ground composed of yellowish-brown loam, which he had cleared in the wood, and planted about the middle of

June with potatoes and peas; of the potatoes he procured a bucket-full of good size and middling good quality. The peas were in blossom, yet a few pods were found to be fit for use. In this patch I discovered three ears of bald wheat, the seed of which had been among the peas when sown; they were just getting into blossom, and probably would ripen; the ear was an average size, and the straw about three and a half feet high.

I observed frost only once; it was on the 18th September, but not sufficiently severe to do injury to growing crops; and I was informed by Mr. Julyan that the lowest temperature of the previous winter was only seven degrees of Fahrenheit below zero. On the coast, as might be expected, the atmosphere is damper, and the temperature from ten to fifteen degrees below that of the interior, during June, July, August, and September, and probably May and October.

During the three months of my stay on the island, fogs prevailed for ten days, six of which were the 31st July and the 2d, 3d, 4th, and 5th of August, while we were at South-west Point; Mr. Pope told me it was an unusual occurrence. I observed that frequent openings in the fog were seen towards the land, leading to the idea that it was less dense in the interior.

I observed some cattle at South-west Point, belonging to Mr. Pope and Mr. Corbet; they appeared to be in good condition although they had been left to provide for themselves in the wood openings, or along the shore. A horse belonging to Mr. Pope was in equally good condition.

Harbors.

Gamache or Ellis Bay and Fox Bay are the only two harbors on the island that are comparatively safe in all winds; the former is eight and a half miles from West-end Lighthouse, on the south side; the latter is fifteen miles from Heath Point Lighthouse, on the north side. From Cape Eagle to Cape Henry, across the mouth of Gamache Bay, the distance is two miles, with a breadth of deep water of three quarters of a mile, extending up the bay a mile and a half, while the depth of the

indentation is two miles and a half. Fox Bay is smaller, and has less depth of water than Gamache Bay. The distance across its mouth is a mile and a half, with half a mile of deep water in the centre, extending up the bay nine-tenths of a mile; the whole depth of the indentation being one mile and two-tenths. These two harbors occur in the same geological formation, while the rock presents a very regular and comparatively level surface, over which a road could be easily constructed from one harbor to the other, the distance being 120 miles; by such means the whole island would be brought to within a moderate distance of a road having a natural harbor at each end.

It belongs to an engineer to say how far these natural harbors might be capable of artificial improvement. The belt of reef about a mile wide, that lines the shore within them, is composed of argillaceous limestone, in nearly horizontal beds, which are dry at low water of spring tides. Possibly one mode of improvement might be to make excavations in the limestone to the depth required, and to use the materials thus obtained partly to raise the sides of the excavations high enough for piers, and partly for the construction of break-waters outside. The depth of water on the reefs at spring tides is about six feet, and the strength of the break-water might be made accordingly. I have been informed that a vessel of 500 tons has been loaded with a cargo of timber in Gamache Bay.

During a heavy wind from the east, while I was at Fox Bay, a schooner ran in for shelter, and appeared to be quite safe. On account of the safeness of this harbor, a provision post was established in it; but since the erection of Heath Point Lighthouse, seventeen or eighteen years ago, it has been discontinued. Not a single house now remains, although they appear to have been numerous at one time. I mention this more particularly as on all the charts I have seen *Provision Post* still remains indicated there; and it happened in one instance, at least, that a vessel was wrecked within sight of Heath Point, but the crew, instead of going to the lighthouse, went straight to Fox Bay, where they confidently expected to find shelter; the consequence was that several of them perished with cold and hunger (the time being the beginning of December)

before they could reach the lighthouse at Heath Point. The indication cannot be erased from old charts that may be in the hands of mariners, but I am not aware what means have been taken to make navigators acquainted with the change.

I do not know of any other harbors on the Island that are sheltered from all winds, and it appears to me that from every other position on the coast, any vessel near the shore, down to the size of a schooner, during the existence of one wind or other would be immediately obliged to put to sea; for small boats of from three to ten tons burthen, there are scarcely ten miles of the coast where shelter could not be found by passing up the small rivers at high water; and there are many bays that might perhaps be made safe by excavations similar to those to which allusion has been made.

Rivers and Lakes.

The streams that are met with along the coast are, considering the breadth of the island, very numerous. There is scarcely a mile that is not supplied with its clear stream of water, and every six or nine miles show one of a size sufficiently large, and with a flow sufficiently constant, to keep machinery going. Waterfalls near the coast often present excellent sites for the purpose. The water of these streams is always more or less calcareous. On the south side the largest rivers are the Becscie, the Otter, the Jupiter, (which is the largest on the island,) the Pavillon, and Chaloupe; on the north, the Fox and Salmon Rivers are the largest.

On the south shore numerous ponds and small lakes were seen just inside the shingle beach; towards the east end of the island they occur in the low swampy flat that there runs along the shore. None were met with further back, and none were observed on the north side of the island, except a few small ponds close to the beach.

Great Salt Lake, Little Salt Lake, Chaloupe Lake, and Lake Lacroix on the south side, and Fox Lake on the north side are in reality lagoons of salt water, the tide flowing in and out and mingling with the fresh water of the rivers.

Most of the streams and lakes swarm with the finest brook

trout and salmon trout, and large shoals of mackerel were almost daily observed all around the island. But in my tour I saw no appearance of schooners employed in fishing, with the exception of one at South Point. The only operations I heard of connected with the trade, were carried on at the mouth of a few of the larger streams on the south side and at that of Salmon River on the north by men under Mr. Corbet, the lessee of the island, and they were entirely confined to the taking of salmon and salmon trout. Seals were extremely abundant, and but for a few Indians who come over from Mingan in July and August, and take a few of them on the north side of the island, they would be wholly undisturbed. In the bays and more sheltered places round the island these creatures are met with by thousands. It was not uncommon to stumble across one asleep on the beach, when generally it was despatched with a blow or two of our hammers.

Several species of whale were observed to be abundant towards the west end of the island. This must be a favorite resort, as they were either seen or heard at irregular intervals day and night. One of them, about sixty feet in length, and about fifteen feet above the water's edge, was found grounded on the reef in Prinsta Bay when we passed on the 3d September.

The only fishing schooners I saw, with the exception of the one mentioned, were at the Mingan Islands, where twelve or thirteen came to the harbor for shelter during a storm. I was informed by Mr. Henderson, the gentleman in charge of the Hudson's Bay Company's post at Mingan, that they were all from American ports.

Wild Animals.

The wild animals met with on the island, as far as I am aware, are the common black bear, the red, the black, and the silver fox, and the marten. Bears are said to be very numerous and hunters talk of their being met with by dozens at a time; but on my excursion I only observed one at Ellis Bay, two near Cormorant Point, and one in the neighborhood of Observation Cape. I came upon the last one on a narrow strip

of beach at the foot of a high and nearly vertical cliff. Seen from a distance I took the animal for a burnt log, and it was only when within fifty yards of him that I perceived my mistake. He appeared to be too busily engaged in making his morning meal, on the remains of a seal, to pay any attention to me. for, although with a view of giving him notice to quit, I struck my hammer upon a boulder that was near, and made other noises which I conceived might alarm him, he never raised his head to show that he was aware of my presence, but fed on until he had finished the carcase, obliging me, having no rifle, to remain a looker-on for half an hour. When nothing of the seal remained but the bones, the bear climbed in a leisurely way up the face of the naked cliff, which could not be many degrees out of the perpendicular, throwing down as he passed considerable blocks of rock, and disappeared over the summit which was not less than a hundred feet above the sea.

Foxes and martens are very abundant; the marten was frequently heard during the night in the neighborhood of our camp, and foxes were seen on several occasions. Of the silver-grey fox, the skin of which frequently sells for from twenty-five to thirty pounds currency, from four to twelve have been obtained by the hunters every winter. Mr. Corbet, the lessee of the island, employs several men during that season to hunt these animals for their fur, and I understand he makes some profit by the trade.

I heard of no animals of any other description, with the exception of wild fowl, and I saw no frogs nor reptiles of any description, and I was informed by the hunters that there were none.

Distribution of the Rocks.

The rocks of the island were found on examination to be in great part somewhat different in their general lithological character, as well as in their fossil contents, from any that had previously come under my notice. I therefore resolved to separate them into certain stratagraphical groups, leavingt he determination of their geological age to future investigation. These divisions in ascending order I shall therefore call—

1. Division A.
2. Division B.
3. Division C.
4. Division D.
5. Division E.
6. Division F.

Division A.

This division of the strata, which was the lowest met with, is, in its general character, an argillaceous limestone; the best section of it occurs in the neighborhood of English Head, at the west end of the island, and the following is a sequence of the beds in ascending order:

	ft.	*in.*
Grey limestone beds of two and three inches thick, interstratified with greenish colored shale; the limestone beds are in places filled with fossils in patches of from two to three feet in diameter, while no fossils would be observed in the same bed for considerable intervals. These fossils consisted of univalve and bivalve shells, and the surfaces of the shale were covered with fucoids. The beds of limestone are hard and compact, and the fossils are in consequence with difficulty got out	20	0
Grey limestones and shales of a similar character	24	0
Grey limestones and shales of a similar character, with the addition of interstratified layers of conglomerate limestone of two or three inches thick, in which the pebbles consist of grey limestone and greenish shale, and measure more in the plain of the beds than transversely to them; the diameter of the largest is about three inches; the pebbles lie in a grey argillaceous matrix	13	0
Grey limestones, shales and conglomerates similar to the preceding beds,	12	6
Grey limestones, shales and conglomerates as before; this part is very fossiliferous	10	0
Grey argillaceous limestone, interstratified with greenish argillaceous shale	63	0
Grey argillaceous limestone, and greenish argillaceous shale similar to the last, interstratified with beds of pure limestone, and of limestone conglomerate	86	0
Bluish-grey, hard, brittle, argillo-calcareous bed, smooth on the surface, with remarkable impressions like the track of some animal, consisting of two parallel rows of semi-circular pits. each pit of about half an inch in diameter and separated from the succeeding one about a quarter of an inch, the one row separated from the other about half an inch, and so arranged that the curves of the pits are on the outside, while the centre of each pit is opposite the interrupted circumference of two pits on the other side; the bottoms of the pits on		

	ft.	in.
opposite sides slope away from one another, leaving a species of ridge between them; these double rows of alternate pits are usually from about ten to about eighteen inches long, and are more deeply impressed at one extremity than at the other; the impressions are so numerous on some parts of the surface that scarcely a square yard was without them	0	6
	229	0

The thickness above given is well exposed in the neighborhood referred to, either on the reef or in the cliff. The strata occupy a breadth of nearly a mile at English Head. Their dip is S.; and the slope 234 feet in a mile. The lower beds are in the reef (dry at low water), which is about half a mile on the outside of the head; the highest beds are at Otter or Indian Cove, where the stream from Marl Lake empties itself into the sea over the bed holding in such abundance the impressions that have been described.

Following the coast in an easterly direction, the measures appear to coincide with it in a general way for nine miles to the point corresponding with Macastey Mountain; for here the Indian Cove track-bed comes out on the shore with a strike N. 55° E., and is traceable to the east side of Macastey Bay, where, after showing a sinuosity rudely conforming to the shape of the bay, it enters upon the land with a strike S. 84° E., showing a dip S. 6° W.$\angle 2\frac{1}{2}°$.

Between this and White Cliff, which is the next point examined on the coast, there is an interval of fourteen miles, along which it is probable the measures nearly coincide with the general trend of the shore; for while there is a uniformity in the physical aspect of the country facing the sea the whole way, the fossils of the cliff in a hundred feet of thickness resemble those of English Head, and the dip of the strata is S. 10 W.$\angle 1°$ to $1\frac{1}{2}°$.

The same uniformity of geographical aspect is preserved to High Cliff, six miles further, and judging from the identity of some fossils, the higher beds of this division are brought to the shore on the west side of the next bay, though the track-bed was not seen. The dip is here S. 15° W., with the augmented slope of 800 feet in a mile. This increased inclination, how-

ever, is maintained but for a very short distance, and following a bed of shale for a couple of miles, from the west to the east side of the bay, the dip gradually becomes S. 4° W., with a slope of 100 feet in a mile; and while the lower beds were observed to follow the bend of the coast for at least a mile further, the higher ones gained the land, and were observed about half a mile from the shore up Nugg River, the position of which is five miles still further on, where they display a dip S. 14° W. $<$ from 2° to $2\frac{1}{2}$°.

From Nugg River to West Cliff the distance is nineteen miles; the coast is nearly straight and presents no new geographical feature. About five miles before reaching the cliff there is a lower one, exposing about eighty feet, the fossils of which resemble those on the coast of English Head. The strata were seen presenting lines along the face of the cliff about parallel with high water mark, with a slope of one or two degrees inland. Approaching West Cliff from this, two trap dykes were observed on the beach; one of them about half a mile west of the cliff, with a breadth of about twenty yards, was visible for 120 yards in a bearing N. 62° W.; the other close by the base of the cliff, with a breadth of fifty yards, was seen for about twenty yards in the bearing N. 47° W. Both dykes were composed of fine-grained greenstone, with whitish feldspar and black hornblende, and neither of them appeared to produce any disturbance of the beds; but at the time of observation the sea was close upon them, and it was not easy to determine much with accuracy. The fossils of the cliff in which there are 130 feet of strata supposed to belong to this division, resemble those of English Head in species and in grouping, and on the east side of the cliff the dip was determined to be S. 17° W. $\angle 1°$ or $1\frac{1}{2}$°.

Three miles further east, beds of the same general character become exposed in cliffs of from twenty to forty feet high, and in their associated reefs, and were several times repeated with no observed deviation between the strike and the general trend of the coast, to Charleton Point, a distance of six miles more, where the dip was ascertained to be S. 18° W. $\angle 1°$.

At Charleton Point some of the beds are crowded with fossils standing out in bold relief on the weathered surfaces, and

well defined forms also were obtained from the debris of the cliff. Of these, six or seven species are the same as species obtained at English Head, but there are many that are different. The same beds are repeated at Spruce Point, about three miles further east, and twice more at points in the six succeeding miles, in which there appears to be little or no change of the dip. This is to the west horn of Observation Bay, and crossing this bay to the east horn, which is Observation Cliff, we find at the very base of it a bed of exactly the same lithological character, and presenting on its surface the same peculiar impressions as those at Otter or Indian Cove. The dip at this spot is S. 13° W. ∠1°, and the strike from it westward would bring the bed a little within the western horn, the distance being six miles, but the track-bed was not there detected.

The distance from Indian Cove to Observation Cliff is eighty-two miles, and the bearing in a straight line S. 81° E. At every point examined in the whole distance, the beds vary but little in their lithological characters from those given in the detailed section at English Head. This fact, however, is not of much value in establishing the stratagraphical equivalence, as beds not much differing from these are met within in the succeeding division. Nor for the same reason can the general resemblance of the fossils be insisted on, for although there are five or six well known Lower Silurian species at all the points, there are other well known Lower Silurian species that are present at some points and absent at others, while there are many species which I have for the first time seen, some belonging to the whole distance, and some, as far as yet known, peculiar to different points, and nearly all the species ascend to the succeeding division. The whole means of establishing the equivalence of the strata are thus reduced to the strike and the track-bed, which I conceive to be one and the same bed at both extremes of the line; for while it comes upon the coast in three places, just about where it ought to do in order to be in conformity with the strike, it is accompanied in each case by a bed immediately below containing *Atrypa erratica* of Hall, and a new species of *Cypricardia*, about eighty or ninety feet above, which was found nowhere else. I

have, therefore, ventured to make the bed a stratagraphical station in the superposition of the beds, and to consider that the western eighty-two miles of the north coast of the island belong to Division A.

Division B.

The rocks which succeed the track-bed at Indian Cove, and extend to what I have previously called Junction Cliff, situated three miles and a half west of Ellis Bay, compose the next division. They are in ascending order as follows:

	ft.	*in.*
Bluish-grey somewhat argillaceous limestone in hard and compact beds of from three to six inches thick, interstratified with partings of greenish shale; towards the top there are thin bands of light reddish-grey limestone, rather purer than those below; some of the beds contain fragments of trilobites and other fossils of which it is difficult to procure good specimens from the hardness of the rock; the surfaces of some of the beds show fucoids.....	50	0
Grey limestone beds of from three to six inches with shale partings between, much like the preceding in character; the top bed contains numerous beautiful specimens of corals of a pure yellowish-white color standing out in relief on the surface.....	5	0
Reddish-grey limestone in thin beds, holding at the top a characteristic fossil, which appears to be a new species of *Cypricardia*....	20	0
Reddish-grey limestone beds with thin greenish shale partings, interstratified at intervals of from three to ten feet with beds of from three to six inches, consisting of conglomerate, the pebbles of which are composed of grey limestone, and are of various sizes up to three inches in diameter, lying flat in the bed in a matrix of grey limestone; many fragments of trilobites are met with in the deposit with other fossils.....	25	0
Reddish-grey limestones, conglomerates and shale partings as before.	16	0
Reddish-grey limestones, conglomerates and shale partings as before.	72	0
Reddish-grey limestones in beds of from six to ten inches, interstratified with conglomerates as before; among other organic remains these beds contain in some abundance a tree-like species of fossil with a rough, wrinkled, or nodular exterior resembling some kinds of bark, and an irregularly chambered tube in the centre with curved septa; around the tube, the chambers of which are empty, there are arranged numerous concentric layers; the whole of the fossil, including the septa, is composed of a yellowish-white carbonate of lime, crystals of which, in the form of dog-tooth spar, stand out from the walls of some of the chambers; the concentric layers are in some cases partially separated, and the exterior sometimes shows that into such spaces the exterior coating of the fossil has been squeezed down, after being broken;		

	ft.	in.
these fossils are of various sizes from three to seven inches in diameter, and one of them of about six inches in diameter showed a length of five feet; they all lie prostrate in the beds. In addition to these tree-like fossils there are corals of the same yellowish-white color in considerable abundance, with other fossils.....	102	0
Grey limestones, conglomerates and shale partings with similar fossils; a bed at the top contains heads of enerinites in some abundance.....	82	0
Grey limestones, conglomerates and shale partings with fossils as before.....	33	0
Grey limestones, conglomerates and shale partings as before, and in addition to the tree-like fossil, corals and other organic remains, a considerable number of orthoceratites are present, but the hard nature of the beds in which they generally occur makes it difficult to get them out in a good state of preservation	64	0
Grey limestones, conglomerates and shale partings; in addition to the fossils previously mentioned, there is a greater abundance of spiral shells, chiefly *Murchisonia*, than in any of the beds lower down.....	165	0
Measures concealed: the shingle on the beach is largely made up of argillo-arenaceous shale of a greenish tinge mingled with worn fragments of grey limestone; from the fact that this arenaceous shale did not occur at other parts of the beach, and from its easily destructible character, it is probable that the beds from which it was derived constitute a considerable part of the measures concealed	96	0
	730	0

The distance which this division occupies between Indian Cove and Junction Cliff at the west end of the island is very nearly seven miles. At the cove the dip is S. 6° W., at West End Lighthouse, S. 10° W., half-way between this and Junction Cliff S. 10° W.; the average is about S. 11° W., and the breadth across the division in this direction is three miles and four-fifths, which would give an average slope of 190 feet in a mile.

From the position of the track-bed in Macastey Bay, the whole height of Macastey Mountain, 400 feet, would belong to this division, as would probably all the inland elevations visible from the sea as far as Charleton Point. The first coast cliff belonging to it in this direction is Observation Cliff, where 350 feet of the base of the division rise at once from the sea.

The dip at the base of Observation Cliff, as has already been stated, is S. 13° W.<1°; at the second cliff beyond, it is S. 23° W.<1¼°; and at the third S. 13° W.<1¼°; the distance of the last from Observation Cliff being about four miles, and the strike of the measures along the coast, as deduced from the above, would carry the track-bed out in front of the third cliff a little more than a mile, while the average slope would place it about 100 feet below its base. In the third cliff there is a height of 250 feet; so that its summit would probably not show any beds higher than those of Observation Cliff. The distance to the next point is about two miles and a half, and the strike bears very nearly for it; as the measures gradually diminish in inclination towards Guy Point, which is about the same distance further on, and then become quite flat, it is probable that the base of this cliff is not over twenty feet further in vertical height from the track-bed than the base of the cliff mentioned before.

Guy Point has a height of about 200 feet; its summit therefore will scarcely reach so high in the stratification as that of Observation Cliff. The horizontality of the stratification in Guy Point may extend about half a mile at right angles to the general strike further west, and would carry the same beds that are at its base to the base of the next cliff eastward, and this would not bring in a greater amount of additional strata than perhaps thirty feet in the bight of Bear Bay beyond. The base of the cliff leading to Bear Head would thus be about 150 feet over the track-bed.

From Bear Head the coast takes a turn more across the stratification. The dip at the head is S. 17° W., and the inclination, as determined by tracing a bed round into the succeeding cove, is seventy feet in a mile, which would be the amount gained upon the strata at the base of the next point. It would require another mile across the strata to reach the base of the next cliff, which is Tower Point, and about half a mile to reach a position in White Bay beyond, which would be in the strike of the most northern point of Cape Robert; but in this mile and a half the inclination increases to probably 100 feet in a mile, so that the base of Cape Robert would be about 370 feet above the track-bed.

The dip at Cape Robert is S. 13° W.<1¼°, while that of Cape Henry, about three miles and a half further on, is S. 23° W.<1¼°, and the base of Cape Henry would probably be thirty feet higher, making about 400 feet above the track-bed. At the base of Cape Henry were met with the first observed examples going eastward along the coast of the tree-like fossil, occurring 188 feet above the track-bed at the west end of the island; but as the vertical distance at Cape Henry would thus be more than twice as great, it is not improbable that examples of the fossil may yet be found further west.

Cape Henry has a vertical face of about 300 feet, the whole of which appeared to be calcareous; the summit of the cliff would thus be about 700 feet above the track-bed. Crossing the mouth of Salmon River to Battery Point, the next in succession to Cape Henry, a vertical cliff of about sixty feet in height presents itself, in which the prostrate forms of the tree-like fossil protrude from the cliff in tiers, each fossil presenting a circular extremity, with an orifice in the centre, giving to the cliff the aspect of a battery of guns, which has led to its name.

In the bight of a cove, about two miles east of Battery Point, the limestones are followed by arenaceous shales, and the next point, Cape Joseph, which presents a cliff of 180 feet in height, is probably crowned with them, as in the bight of the cove beyond some sandstones, which I could not approach the coast to visit, give to a cliff the name of Grindstone Cape. These sandstones must run along the coast for about five miles, composing part of the face of Cape James in their course, and coming to the level of the water in Prinsta Bay; they then strike across this bay and run round the lower part of Table Head, where they exhibit a thickness of about fifty feet. The sandstones then sink beneath the level of the water with a dip S. 19° W.<2°, presenting the following section in ascending order:

	ft.	*in*
Greenish-grey, thin bedded, fine grained sandstone, with black and brown mica between the layers; the rock is slightly calcareous..	7	6
Greenish-grey, fine grained, slightly calcareous sandstone in thin beds.....	6	0
Greenish-grey, fine grained, slightly calcareous sandstone, with brown and black mica between the layers, which are from three to ten		

	ft.	in.
inches in thickness; one bed of from seven to ten inches thick, is free grained, would make a good building stone, and might probably be fit for grindstones	5	6
Greenish-grey, fine grained, thin bedded and slightly calcareous sandstone, interstratified with layers of from three to six inches thick, more calcareous from the presence of fossils, chiefly convoluted shells, which are mixed up with small pebbles of white and green quartz, some as large as beans, as well as a few grains of blood-red jasper; mica is present between the layers	22	0
Greenish-grey, fine grained sandstone, with fossiliferous coarse grained layers as before	5	6
Greenish-grey, fine grained, slightly calcareous sandstone in beds of one and two feet, which in some parts run into thin slabs, showing fossils on their surface	6	9
	53	3

The last of these beds would be about 750 feet above the track-bed, and the whole of them probably correspond with the supposed arenaceous beds of the west end section. Division B would thus appear to occupy about forty miles of the coast, with the exception of about two miles in the bight of Prinsta Bay, which is comprehended in the succeeding one.

Division C.

Continuing the sequence of the beds at the west end, where the previous division ended near Junction Cliff, the following constitutes the succeeding division in ascending order:

	ft.	in.
Greenish argillo-arenaceous shale	1	0
Greenish argillo-arenaceous shale, interstratified with beds of grey limestone of from one to three inches thick; in a two inch bed, a new species of *Lingula* was observed in abundance; in another encrinites were numerous, with other organic remains	1	6
Yellowish-grey, compact, argillaceous limestone, with few observed fossils	10	0
Yellowish-grey, compact argillaceous limestone, interstratified with light reddish-grey limestone beds of from one to three inches thick, the surfaces of which are covered with a new species of *Orthis, (O. Laurentina)* and other fossils; among the debris of these beds many beautiful detached brachiopoda *(Orthis subquadrata* and others) are met with, with spiral univalves *(Murchisonia);* these are the upper beds of Junction Cliff	20	0

	ft.	in.
Measures partly concealed, but supposed to be of the same character as the preceding, both lithologically and palæontologically	25	0
Ash-grey argillaceous limestone, in beds of from one to three inches thick, alternating with calcareo-argillaceous shale beds of from five to seven inches; and these two descriptions of beds again interstratified with light-grey pure limestone beds of one or two inches; no fossils were observed in this part	6	0
Ash-grey argillaceous limestones and shales, interstratified as before with purer limestones; these beds contain a new species of *Pentamerus (P. reversus)*, with several gasteropoda and brachiopoda, some of which are new, and *Atrypa marginalis*, for the first time, I believe, met with on this continent; all the species are found preserved in the debris and quite detached, as well as standing out in good relief on small slabs, about one mile east of Junction Cliff	20	0
Ash-grey argillaceous limestones and shales, with purer limestones as before, but the fossils not so well preserved, from the beds being exposed to the action of the sea	10	0
Measures concealed	7	0
Ash-grey argillaceous limestones and shales, with purer limestones as before, the fossils not so well preserved in consequence of the action of the sea; this is a mile and a half east of Junction Cliff..	24	0
Measures concealed	30	0
Light yellowish-grey even bedded limestone, in beds of half an inch and two inches, characterized by *Leptæna subplana* in abundance, and one or two instances of a small *Atrypa* probably undescribed, all occuring principally between the layers	3	6
Grey argillaceous limestone	5	0
Yellowish-white coral limestone, the corals of which consist chiefly of four genera: *Chætetes*, *Favosites*, *Heliolites*, and *Catenipora*, and they are aggregated in hummocky masses, often composing one-half or three-quarters of the thickness, being from one to three feet, both horizontally and vertically, and in some instances six feet horizontally. They are surrounded with an ash-grey argillaceous limestone, and cause the overlying bed, conforming to the hummocks, to have the appearance of slightly undulating strata	4	6

The last bed occurs at Point Laframboise, and the overlying strata being less extensively developed there than to the eastward, the coral bed was searched for in Ellis bay, and found nearly two miles to the east on the strike, at Cape Henry, which is the west horn of Ellis Bay, and again at Cape Eagle, the east horn, two miles still further on the strike. The measures below in ascending order, being the equivalents of a part of those at Point Laframboise, are as follows:

Grey limestone, interstratified with grey calcareo-argillaceous shale, sometimes of a greenish color, the lowest bed

	ft.	in.
characterized by a new species of *Murchisonia (M. rugosa)*, and the tree-like fossil which has been described as existing in the previous division. This fossil is here of larger size than before observed; one specimen now in the museum of the Survey is ten and a half feet long, six inches in diameter at the larger end, and but an inch or so less at the other. Some of the fragments of others obtained were found to be ten and even fifteen inches in diameter, and if the length were proportionate must, when whole, have been probably over thirty feet in length.....	12	0
Light yellowish-grey limestone, in beds of from half an inch to two inches thick, with occasional partings of calcareo-argillaceous shale and abundance of *Leptæna subplana*, and two small species of *Atrypa*.....	5	0
Yellowish coral limestone bed, as before.....	5	0
	22	0
The measures above the coral bed, in continuation of the section, are as follows:		
Grey limestone, with argillaceous partings; these beds were not continuously examined, but the fossils of some of the beds were *Strophomena depressa*, *Leptæna subplana*, *Ambonychia radiata*, and some undescribed species	62	0
Grey compact argillo-calcareous beds, slightly bituminous, interstratified with argillaceous shales; but few fossils were observed, and such as were seen were obscure; these beds form Bear Head....	42	0
Measures supposed to be similar to the last, but not thoroughly examined	35	0
	306	6

The dip of these beds at Junction Cliff is S. 13° W.; one mile to the east of it, S. 10° W.; at White Cliff, Ellis Bay, S. 4° W.; at Cape Eagle, S. 18° W.; at Bear Point, S. 21° W. The average of these would be about S. 13° W.; the inclination is a little over 100 feet in a mile, and the direct distance across the strata is three miles. The distance along the coast occupied by the division extending from Junction Cliff to Long Point is about eight miles and a quarter.

This division as a whole appears to be softer than the preceding ones; it offers no very remarkable cliffs along the coast on the south side, while Ellis or Gamache Bay is worn out of it as well as a depression holding Gamache Lake and the creek which empties it at the head of the bay.

On the north coast the rocks of the division are met with in the east part of Cape James, and in the bight of Prinsta Bay, where they succeed the sandstones which have been mentioned, and occupy nearly two miles of the coast. In their outcrop further eastward they crown Table Head and come to the level of the water on the east side of it.

The following is a section of the base of the division at this spot in ascending order, as it rests upon the sandstones of which a section was given in the preceding division:

	ft.	*in.*
Grey limestone in even beds	6	0
Grey limestone filled with several genera of corals of a yellowish-white color	3	0
Grey shale and limestone in patches, interlocking in such a manner as to make the bedding obscure; no fossils were observed	6	6
Grey thin-bedded fossiliferous limestone, with interstratified shale	8	0
Grey limestone, with yellowish-white corals	2	6
Grey yellow-weathering limestone, with yellowish-white corals	1	9
Grey limestone in thin beds, with thin beds of argillo-arenaceous shale slightly calcareous	9	0
Grey arenaceous limestone, with small scales of brown mica disseminated through it; at the base it has a mamillated hummocky character, the layers in succession getting thicker and thicker in the centre or the hummocks, which are from three inches to three feet in diameter; the whole bed thins down to a quarter of an inch in about a quarter of a mile on the strike; and then thickens again further on, and this appears to be repeated more than once in the dip and rise as well as the strike; the layers split away from one another in smooth curved forms, but the exterior of the hummocks is rough, being marked with small parallel ridges for short distances, and studded with fossils	3	6
Greenish-colored shale, interstratified with thin beds of grey limestone	17	3
Grey calcareo-argillaceous shale with limestone crowded with corals and the tree-like fossils heretofore described. Both of these kinds of organic remains are so numerous and so confusedly mixed as to give to the whole mass at a little distance the aspect of a breccia, and it can in consequence be traced easily by the eye in the face of the cliff round Table Head, as well as round Cape James, for a distance of six miles on the strike	14	0
Grey compact argillaceous limestone, interstratified with beds of purer limestone of a lighter color, which are, however, in some parts slightly arenaceous Numerous fossils were observed in the mass, but they were for the most part obscure. At the base there were *Murchisonæ* of eight or even ten inches long; *Cœnipora* occurred and *Atrypa naviformis* was among the fossils; about the top of		

	ft.	in.
the mass *Leptæna subplana* was in some abundance. A fine collection of fossils from this deposit was unfortunately left behind by the boatmen.....	110	0
	181	6

The rocks of this section reach the position of the old provision post at Fox River; between the provision post and the foot of an escarpment south of the lagoon at the mouth of the river, the distance is about a furlong over a mile, across the strata, and the dip of the measures is S. 18° W., with a slope of 100 feet in a mile. This would add to the section about 115 feet, which are concealed under the river and lagoon, making the whole thickness 296 feet.

As is the case in the neighborhood of Ellis Bay, the cliffs composed of the rocks of this division at Fox River are low, not exceeding thirty or forty feet, and the deep excavation forming the harbor is another feature which the two extremities of the deposit have in common.

The escarpment which limits the division south of the lagoon comes out upon the coast about a mile and a quarter beyond Reef Point, the eastern horn of Fox Bay, and the division would thus occupy a distance along the coast from Table Head of upward of seven miles.

Division D.

Immediately overlying the upper beds of the last division, as given in the section in the neighborhood of Ellis Bay, there occur at Long Point about twenty feet of light grey limestone, in beds of from two to six inches, many of which are crowded with another new species of *Pentamerus (P. Barrandi,)* with but few other fossils, and these beds alternate with others holding *Leptæna subplana*, but in less abundance, a few individuals of *Pentamerus* being associated with them. The dip of the measures is here S. 21° W., with an inclination of 120 feet in a mile. The strike of the base of these measures would carry us to the mouth of Duck River, and we accordingly have there a repetition of them in thickness and in average dip.

Similar beds are traceable to Wall's Cove, and here by means of the reef, a thickness of forty-five feet of the same character can be verified, resting upon strata composing a low cliff lining the bight of the bay; as they contained no observed fossils, they were supposed to form the summit of the previous division. In Wall's Cove, while the strata of Division D are as much crowded as before with *Pentamerus*, the specimens obtained are of a more perfect description, and a few corals are mingled with them. From Wall's Cove the strike and strata coincide all the way to Beescie River, and here on the reef the thickness of similar strata that were examined amounts to ninety-eight feet, resting, as in the case of Wall's Cove, upon beds of the division C, occurring at the river's mouth. The dip at Beescie River is S. 22° W., with a slope of 120 feet in a mile; the coast east of the river is low, and coincides with the strike corresponding with the dip given, as far as St. Mary's River. Beyond this there are cliffs, but they are composed of clay mixed with limestone gravel, and extend to St. Ann's Cove, the margin of which is low and destitute of rocks as far as the point west of Otter River.

At Otter River the *pentamerus* beds are again seen, and as the dip is there S. 40° W., with a slope much the same as before, it is probable the strike would nearly coincide with the westward run of the coast to St. Mary's River. It is thus probable that these beds are equivalent to a part of the Otter River section; but between these beds and the next that are seen, less than a mile to the eastward of Otter River, there would be an interval of about a quarter of a mile across the stratification, which would give room for thirty feet of strata; but whether this is to be considered a part of the ninety-eight feet measured at Otter River, or an addition to it, I am unable to say. The examination on the reef at Otter River was interrupted by the rise of the tide before we could ascertain the character of all the strata which had been exposed at low water, and as we had not arrived at any beds limiting the upward occurrence of the *Pentamerus*, the whole thickness characterized by its abundance may exceed what I have stated. In the ninety-eight feet, a few feet were allowed for what was seen in the rising water in front of me; if, however, the whole

thickness be called a hundred feet, and the beds in the first exposure east of Otter River be added to it, the following will be the section from the base, in ascending order:

	ft.	in.
Ash-grey and light reddish-grey limestones, in beds of from two to six inches thick, interstratified in the upper part with conglomerate beds of the same thickness, at intervals of from two to ten feet; the pebbles of these are calcareous, with a diameter of from one to three inches, and lie flat in the beds; a vast number of the beds are crowded with *Pentamerus Barrandi;* with this, however, in some beds are associated two or three species of corals, and the *Pentamerus* layers are interstratified with others that show great numbers of *Leptæna subplana*, and other fossils	100	0
Dark ash-grey, slightly bituminous limestone, in beds of from two to six inches, with calcareo-argillaceous partings, weathering light orange-brown; conglomerate layers with limestone pebbles occur at irregular intervals; the lowest six feet are characterized by the occurrence in some abundance of a new species of *Atrypa*, and *Strophomena alternata* is frequent in the deposit, with *Orthis* and other fossils	20	6
Dark ash-grey, slightly bituminous limestone, with calcareo-argillaceous partings, weathering light orange-brown, similar to the preceding	34	6
Dark ash-grey slightly bituminous limestone, as before, with but few fossils	36	0
Reddish-grey limestone, in beds of from one quarter of an inch to three inches, some of which weather to a reddish-brown, interstratified with occasional conglomerate layers of from two to four inches thick; some beds at the base of the deposit are characterized by a species of *Syringopora*, resembling *S. bifurcata*, and by deep serpentining grooves of about a quarter of an inch wide, with raised edges, apparently marking the track of some species of mollusk; other fossils occur in other parts, and the middle of the deposit is marked by the presence of *Strophomena alternata* in considerable numbers	43	0
Reddish-grey limestone, weathering reddish-brown, in beds of from one to three inches, interstratified with occasional conglomerate beds of from three to six inches thick. Among the fossils which are met with are *Strophomena* and *Favosites*	30	0
	264	0

The last 164 feet of the previous section are ascertained by actual measurement of the beds as they accumulate on one another, going east along the coast for about two miles, in a direction oblique to the stratification. The dip at the commencement was S. 33° W., and at the end S. 40° W., and the

inclination is estimated to be about 200 feet in a mile. Carrying on the last dip to the next exposure, which occurs at the distance of a mile further east, it is estimated that there is a thickness of about twenty feet of strata wanting between the two. The cliff then presents thirty-four feet of grey limestone, weathering yellowish, and containing but few fossils. The surface of one bed towards the middle of the mass is characterized by a peculiarity which is probably the result of weathering. The bed is about a couple of inches thick, and is worn into a multitude of rather deep connected pits about an inch across and two or three inches long, in each of which is perceived a fragment of a shell standing with its edge up. There is a general rude parallelism in the pits, but some of them cross others, and some descend nearly through the bed.

In the exact strike of this cliff, as decided by the run of single beds which can be seen for nearly a mile along this reef, another cliff occurs at nearly twice that distance, with a lithological aspect similar to the last, but with a rather larger number of fossils. The base is marked by *Atrypa congesta*, and some of the beds higher up by an *Orthis* resembling *O. Laurentina*, and by a species of *Favosites*. The beds of this cliff are supposed to be included in those of the previous one.

To the next exposure there is a distance of something less than a mile, and from the strike of the strata it is computed that in the intermediate parts there are concealed about seventeen feet, reaching to the base of the cliff in which the exposure occurs. The cliff, which is forty feet high, occupies about two miles and a half of the coast, and for two-thirds of the distance the strata appear to be horizontal, then turning down with a gentle slope to give an addition of twenty-five feet in the remaining third. The following section gives the details of these sixty-five feet in ascending order:

	ft.	*in.*
Light-grey bituminous limestone, in beds of from one quarter of an inch to ten inches thick, weathering yellowish-brown in some parts, and holding *Atrypa reticularis* (its first appearance) and numerous remains of *Crinoidea*, and several species of turbinated corals	10	0
Light smoke-grey, slightly bituminous limestone, more argillaceous than the last, weathering to a yellowish-brown, in beds of from one to two inches, without observed fossils	5	0

	fl.	in.
Light-grey bituminous limestone, similar to the lowest beds, with *Murchisonia* and other fossils	5	0
Reddish ash-grey argillaceous limestones, slightly bituminous, in beds of from half an inch to ten inches, with abundance of slender serpentining fucoids of a dull yellowish-white, very conspicuous from the contrast of color; *Stophomena alternata* also occurs	20	0
Light smoke-grey limestone, in beds of from one to ten inches, with the tree-like fossil and ascidians in the lower beds, and in others *Cælenipora escharoides*, with the genera *Favosites*, *Pleurotomaria*, *Murchisonia*, *Orthis*, *Leptæna* and *Atrypa*. Some of the beds at the top are ash-grey in color	25	0
	65	0

Between this cliff and what is considered the base of the succeeding division, the dip of the strata would bring in about twenty-seven feet, which are concealed. The total thickness of the division would thus be:

	fl.	in.
Pentamerus beds and Otter River section	264	0
Measures concealed	40	0
Table River section	34	0
Measures concealed	17	0
Two-mile Cliff section	65	0
Measures concealed	27	0
	447	0

The rocks of the division reach to within about a mile of the mouth of Jupiter River, and the total distance which they occupy on the coast from Long Point is upwards of thirty-six miles.

The rocks on the north side of the island at the east end, which from their position in the succession there are supposed to represent this division, have been as yet too imperfectly examined to enable me to speak with confidence in respect to their volume; nor has anything very striking been observed to establish their exact equivalence, so that it is from the relation they bear to what is below and what is above, rather than from what the north and south localities have in common, that the strata are given as representatives of one another. On the north coast they occupy ten miles, and deep water prevails

along the whole of it; in most places the sea beats against the cliff at high water, and in some even at low water, and there are but two or three coves at which a landing can be easily made; it would require very calm weather to effect a thorough examination. With perfectly calm weather, however, every bed in succession might be investigated, as none are concealed in the whole distance. At the time of my visit to the locality there was a considerable stretch of the cliff which we durst not allow our boat to approach, and it was only at the two extremities that admeasurements were made.

Commencing at the base the first disappointment experienced was to find scarcely a trace of the pentamerus beds, so conspicuous on the south side; for with the exception of a single valve of a *Pentamerus*, resembling *P. Barrandi*, not a specimen of the species was met with; instead of it a species of *Atrypa*, resembling *A. robusta* of Hall, prevailed in great abundance, no example of which again was found on the south side. The following is the section obtained at Gull Cape, beginning at the escarpment which has been mentioned as coming to the coast south of Reef Point, where the previous division terminated; the beds are given in ascending order:

	ft.	*in.*
Lead-grey limestone, in thin beds, interstratified with greenish calcareo-argillaceous shales, slightly arenaceous, and both limestone and shale slightly bituminous; the only fossil observed in it was an *Atrypa*, but not in great abundance	19	0
Lead-grey limestone, with no observed fossils	0	9
Greenish arenaceo-argillaceous shale, slightly calcareous as well as slightly bituminous, crowded with an *Atrypa* (resembling *A. robusta* of Hall); the shale, on exposure to the weather, exfoliates and crumbles, and the fossils, being hard limestone, are easily obtained in a perfect condition	25	0
Greenish arenaceo-argillaceous shale of the same character as the last, with a variety of the same *Atrypa* as the last, much larger in size; one valve of a *Pentamerus* was met with so much resembling *P. Barrandi* as to leave little doubt that it is the same species, though rather larger than any met with on the south side of the island	5	0
Light yellowish-grey bituminous limestone, in beds of from half an inch to two inches, holding *Atrypa*	20	0
Dark-grey slightly bituminous limestone, in beds of from one to three inches, and towards the top six inches, separated by partings of greenish calcareo-argillaceous shale; fossils weather out in good relief on the surface, the most prevalent being *Orthis*	38	0

	ft.	in.
Dark grey slightly bituminous limestone, in beds of from three to nine inches, resembling the previous mass, but without observed fossils	20	0
	127	9

This section was obtained by the measurement of accumulating strata in the cliff as far as Gull Cove, where the highest bed was about sixty feet above high water mark, leaving sixty-seven feet as the thickness that had been passed over at the water's edge. The dip was S. 28° W., and the distance across the measures was three-quarters of a mile, so that the inclination was about ninety feet in a mile; this inclination would carry the sixty feet that are in the cliff to the level of the water in a distance of fifty-three chains in the direction of the dip, and following the strike to the westward, it would come out in Sand-top Bay, where the dip is S. 38° W., at such a distance from the bight of it as would give eighteen feet to the foot of the cliff there. The following section obtained in the cliff gives the details of the succeeding sixty feet in ascending order:

	ft.	in.
Yellowish-grey, compact, slightly bituminous limestone, in beds of from two to four inches, with few observed fossils, with the exception of three inches at the top, which are a mass of *Murchisonia*, resembling *M. gracilis*, with a few instances of *Orthoceras*, and one or two examples of *Pentamerus*, resembling *P. lens*	20	0
Yellowish-grey slightly bituminous limestone, in beds of from half an inch to three inches in thickness, with occasional partings of yellowish-grey calcareous shale; the surfaces of the beds are fossiliferous, and among the fossils are *Calymene Blumenbachii. Orthis*, *Murchisonia* resembling *M. gracilis*, and *Crinoidea*	15	0
Yellowish-grey, interstratified with greyish-yellow slightly bituminous limestone, in beds of from half an inch to two inches, with partings of calcareous shale. The surfaces of the beds show fossils, among which are *Pentamerus* resembling *P. lens*, *Murchisonia* resembling *gracilis*, *Leptæna*, resembling *subplana*, but rather more convex, with *Crinoidea*	15	0
Yellowish-grey and greyish-yellow limestone, as before, with the same fossils as the last, with the addition of *Calymene Bluemenbachii*, *Atrypa congesta*, and other small species, with turbinated corals,	10	0
	60	0

In Sand-top Bay the dip, as has been stated, appears to be S.

38° W., and in this direction the top of the preceding section would be carried about fifty-three chains before reaching the level of the sea; following the strike to the eastward, modified by that of Sand-top Cape, the dip there being S. 28° W., the top of the section would come upon the coast in a position which would be just a mile across the measures, from the bight of the bay inside of East Point. The inclination approaching the bight of the bay appears to increase considerably, and by the impression made on the eye by the strata, as seen in the cliff from the boat, I am inclined to think it would be as much as 200 feet in a mile, which would thus be the interval up to the base of the cliff where the next measurement was taken.

From a sudden change, however, which appears to occur in the dip, which becomes S. 3° E., it is not impossible that some dislocation may occur to trouble the calculation. Leaving out this consideration, the following would be the remainder of the beds belonging to the division in ascending order:

	ft.	*in.*
Ash-grey limestone, in beds of from half an inch to three inches, with calcareo-argillaceous partings, interstratified with iron-grey limestones of the same thicknesses. The condition of the weather was such at the time of my visit that it allowed me to examine the upper five feet only, in which there was displayed in considerable abundance a *Cythere* about half an inch long.....	50	0
Yellowish-grey slightly bituminous limestone, charged with a multitude of corals, consisting of the genera *Catenipora, Favosites, Heliolites, Chætetes, Cyathophyllum,* and *Orthis;* on the surface, the bed assumed a hummocky character, some patches of the corals rising from one to five feet high, with the diameter of from two to ten feet, the overlying bed conforming in some degree to the inequalities, and giving the strata the aspect of having been disturbed.....	25	0
	75	0

The coral bed was followed round the coast from the cove to the eastern extremity of East Point, where it sinks beneath the level of the sea, and was taken for the limit of the Division D in that vicinity.

The whole thickness of the division on the north coast would thus be as follows:

	ft.	in.
Gull Cape section	127	9
Measures not examined	18	0
Sand-top Bay section	60	0
Measures not examined	200	0
East Point section	75	0
	480	0

Division E.

The rocks forming the next division commence where those of the previous one terminated, rather more than a mile westward of the mouth of Jupiter River, and occupy the coast between that position and South-west Point, the distance being a little over seven miles, in a direction very nearly S.S.E. The dip of the strata is very constant in its direction, not varying more than about five degrees at any part, the average being S. $7\frac{1}{2}^{\circ}$ W., while the inclination is sometimes 200 feet in a mile, and at others is quite inappreciable. With the exception of some concealment at the base, and more towards and at the summit, the measures are visible all the way, forming cliffs of from twenty to one hundred and fifty feet.

The following is the sequence, in ascending order, of the deposits, from a measurement of each bed in succession as it came upon the one beneath, with the exception of the parts concealed, which were determined by computation:

	ft.	in.
Measures concealed	27	0
Greenish-grey and brown arenaceo-argillaceous shales interstratified, of a fine texture in thin beds, with no observed fossils	60	0
Yellowish-grey and light-drab argillaceous limestone, slightly bituminous, in beds of from one to five inches, cut by parallel joints running N. 85° W., with an occasional joint running oblique to that course; the jointed structure and the general soft nature of the rock cause large masses to fall from the cliff by the action of the sea, which is encroaching rapidly on the land. Among the fossils which are generally in a good state of preservation, there are *Graptolithus*, within about twenty feet of the bottom, *Favosites*, *Atrypa reticularis*, and another resembling *A. tumida*, *Pentamerus*, like *P. lens*, *Myolina*, *Cyclonema*, *Orthoceras*, *Cyrtoceras*, *Calymene Blumenbachii* and *Bumastes barriensis*	80	0
Light-drab argillaceous limestone, slightly bituminous, weathering white, interstratified with yellowish limestone, weathering yellowish-brown both in beds of from two to three inches thick.		

	ft.	in.
The fossils are not numerous, but weathered surfaces present well preserved specimens of *Atrypa reticularis, Leptæna subplana, Calymene Blumenbachii, Lychas, Phacops, Pentamerus lens,* crinoidal columns, and other species	22	6
Ash-grey and light-drab limestones interstratified, both slightly bituminous and in beds of from half an inch to two inches. The surfaces weather nearly white and show fossils of which a large number are weathered nearly black, by contrast presenting distinct and well defined forms; among them are *Atrypa reticularis, Leptæna subplana, Strophomena depressa, Pentamerus lens, Calymene Blumenbachii*	42	6
Ash-grey and light-drab limestones interstratified, both slightly bituminous, in beds of from two to three inches, holding in the upper part, in some abundance, *Pentamerus lens*	10	3
Ash-grey and light-drab limestones interstratified, both slightly bituminous and crowded with *Pentamerus lyratus*	2	6
The position of this bed is just west of the last brook but one, approaching South-west Point.		
Measures concealed	25	0
Light-drab argillaceous limestone, slightly bituminous	1	0
Measures concealed	25	0
Light-drab argillaceous limestone, slightly bituminous, in beds of from half an inch to three inches, containing numerous fossils, of which weathered surfaces present excellent specimens weathered black, while the edges of the beds along the cliff yield others quite free from the rock. Among the fossils are various corals, with *Atrypa reticularis, A. congesta, A. hemispherica, A. naviformis, Spirifer radiatus, Leptæna subplana, L. transversalis,* fragments of *Orthoceras* and *Cyrtoceras, Calymene Blumenbachii, Phacops* (a new species) and an *Encrinurus*	87	6
The position of this deposit is a little east of the last brook, approaching South-west Point.		
Measures concealed at the bight of the cove, north of South-west Point	157	6
	540	9

The rocks at the east end of the island supposed to be equivalent to these, are seen in the section displayed there in continuation of what has already been given to the top of the coral bed at East Point. They are in ascending order as follows:

	ft.	in.
Yellowish-grey slightly bituminous limestone, without any well defined bedding, in some measure filling up the inequalities on the top of the coral bed. The rock breaks easily in the plane of the beds with a conchoidal fracture, and is crowded with well pre-		

	ft.	in.
served fossils, principally *Atrypa hemispherica, and Leptæna subplana;* the thickness of the mass is from two to six feet.....	4	0
Bluish-grey argillo-calcareous shale, holding iron pyrites in some abundance.....	0	2
Dull ash-grey argillo-calcareous shale, containing no observed fossils, interstratified with patches of drab colored argillaceous limestone, slightly bituminous, in beds of from one to two inches thick, occurring at intervals of from one to four feet; on the surfaces of these fossils in good preservation are met with, but not in large numbers; among them are *Atrypa reticularis,* with another species, *Leptæna, Calymene Blumenbachii, Orthoceras, Murchisonia,* and various corals.....	42	0
Light smoke-grey limestone, slightly bituminous, interstratified with drab-colored soft argillaceous limestone, in beds of from half-an-inch to two inches in thickness. The harder beds occasionally weather to a somewhat brown color on the surfaces, and present well-preserved fossils weathering blackish-grey, affording superior specimens for the examination of structure. Among the fossils are *Atrypa reticularis, A. congesta, Leptæna subplana, L. transversalis, L. profunda, Spirifer modestus, Calymene Blumenbachii, Encrinurus, Lychas, Favosites,* small *Bryozoa,* and crinoidal columns.....	75	0
Light smoke-grey slightly bituminous limestones, with drab-colored soft argillaceous limestones, similar in lithological character and in fossils to the last.....	20	0
The preceding part of the section is measured at high water mark across the measures from East Point, the dip being S. 18° W., with an ascertained inclination of a little over 100 feet in a mile.		
The distance at right angles to the strike is two-fifths of a mile.		
Measures concealed by the shingle of the beach, which consists of light smoke-grey limestone mingled with light drab compact argillaceous limestone, but slightly bituminous, pieces of which show among other fossils *Atrypa reticularis, Calymene Blumenbachii, Pentamerus,* resembling *P. lens,* with various corals and broken encrinites.....	35	0
Measures concealed.....	24	0
The top of these measures reaches a position a little over half-a-mile from Heath Point lighthouse.		
Light smoky-grey slightly bituminous limestone, interstratified with reddish-drab argillaceous limestone, also slightly bituminous, both in beds of from one to two inches, occasionally presenting surfaces, on which are weathered out well defined fossils; among them are *Atrypa reticularis, Leptæna subplana, Pentamerus* resembling *P. lyratus,* with small turbinated corals.....	75	0
The top of the previous beds reaches the southern promontory of Heath Point upwards of half-a-mile S. S. W. from the lighthouse.		

	ft.	in.

The dip of the measures in this neighborhood is S. 18° W., and the inclination was ascertained to be eighty feet in a mile. which is the rate allowed for the last three measurements; the distance which the whole occupies at right angles to the strike being two miles and twenty-four chains.

In the bight of the bay west of Heath Point some of the last beds are repeated, but carrying the strike from the eastern horn of the bay to the coast on the opposite side, the following are the beds that occur in continuation of the section :

Light smoke-grey limestone, slightly bituminous, interstratified with light reddish-drab, similar to the last beds, with similar fossils..... 33 9

Measures concealed 9 0

In the two preceding measurements the dip is S. 53° W., and the inclination forty-five feet in a mile, as determined by the first; the distance across the measures is seventy-six chains.

Light smoky-grey and reddish-drab limestones interstratified, similar in lithological character and fossils to the last beds described..... 15 0

Pale drab colored limestone, interstratified with limestone of a more argillaceous character, and of a somewhat darker color, both in beds of from half-an-inch to three inches thick; the surfaces of these afford beautiful and finely preserved fossils; well weathered out, among which are *Atrypa reticularis*, *A. hemispherica*, *Leptæna*, *Pentamerus* resembling *P. lens*, *Calymene Blumenbachii*, *Encrinurus*, tentaculites, crinoidal columns, and small *Briozoa*..... 15 0

Ash-grey limestone in beds of from one to six inches, with thin argillaceous partings; some of the beds are crowded with *Pentamerus oblongus*, and *Atrypa reticularis* is common..... 30 0

The distance across the measures occupied by the last three deposits is sixty chains, and the dip is S. 18 W., with an ascertained inclination of eighty feet in a mile; the dip then changes, approaching a dislocation which occurs at a projecting point, about a mile and three-quarters north-eastward of Cormorant Point.

The course of the fault is N. 37 E., and it produces an upthrow on the west side of forty five feet, by which the last two measurements are repeated. The sequence of the beds beyond these is as follows :

Ash-grey limestones in beds of from one to nine inches, with thin argillaceous partings; some of the beds are filled with *Pentamerus oblongus*, and *Atrypa reticularis* is very frequent 78 0

This deposit reaches to the north side of Cormorant Point; the dip of the measures is S. 20° W., and the ascertained slope is 110 feet in a mile.

Ash-grey limestone, in beds of from one to six inches thick, interstratified with greenish argillo-arenacious shale, slightly calcareous, in beds of from an-eighth to a-fourth of an inch thick; in the three feet at the base, it is in patches of from six inches to one foot thick. Among the fossils are *Zaphrentis bilateralis*, *Stromatopora con-*

centrica, *Favosites*, *favosa*, *Graptolithus*, *Orthoceras* and *Pentamerus oblongus* 45 0

This composes a cliff of from twenty to thirty feet high round Cormorant Point, with a dip S. 18° W., and an inclination ascertained to be eighty feet in a mile, for a breadth across the measures of forty-five chains.

550 11

Eastward from Cormorant Point, the measures are concealed for about three miles, and beyond this all the way to Chicotte River, a distance of about fifty miles, there are occasional exposures of limestone, with intervals of concealment, some of which are very long. All the exposures are supposed to belong to this division, but though the beds in no case show a great inclination, and in several are quite horizontal, the bearings of the dips that are presented vary frequently and considerably, either through small faults or gentle undulations, and it has been found impossible to say with precision to what parts of the division these beds are equivalent, or whether some of them may not add a few feet to the thickness given.

Before describing the positions of these exposures, however, it will be convenient to give a section of the succeeding division.

Division F.

In immediate sequence to the concealed measures which constitute the upper part of the Jupiter River section of the last division, the following beds present themselves in ascending order, and form the whole of the area of what is called South-west Point.

ft. in.

Light smoke-grey limestone, of a somewhat granular character, in beds of from three to six inches thick, with thin partings of green argillo-calcareous shale occurring in patches. Iron pyrites are disseminated through the beds, sometimes in single cubes, and sometimes in aggregations of minute cubes forming nodules of from one to two inches in diameter, discoloring the rock by their decomposition. The ruins of crinoidal columns constitute the organic remains 3 9

Light smoke-grey limestones, with iron pyrites in some abundance, in nodules as before of from half an inch to an inch in diameter, and occasionally on the surface of the bed in patches of from half an inch to an inch and a half thick, and from six to eighteen inches

	ft.	in.
in diameter. Fossils occur in fragments but they are too obscure to be identified	0	6
Light smoke-grey limestone of a granular character, in beds of from two to six inches thick, with partings of green argillo-calcareous shale, which also occurs in patches in the beds, giving them a greenish cast; among the fossils occur *Zaphrentis*, like *Z. bilateralis* of Hall; *Stromatopora concentrica*, *Cyathophyllum*, *Atrypa reticularis*, *Pentamerus oblongus*, *P. lens*, *Orthoceras* and crinoidal columns	7	3
Yellowish or reddish-white granular limestone, with thin vein-like patches of argillo-calcareous shale disseminated through it; the beds are from three too seven inches thick. Among the organic remains, several of which are similar to those of the preceding deposit, *Plyciophyllum* characterizes the present one, some of these being a foot in diameter. *Favosites* also occurs in tables of half an inch thick, and sometimes three feet in diameter	7	6
Yellowish-white granular limestone, in beds of from six to eighteen inches thick, often separated by thin partings of green argillo-calcareous shale, which is also disseminated in small patches through the bed. The fossils are few in species, being chiefly the ruins of crinoidal columns, which in some cases form the entire mass of a bed	20	0
Yellowish-white granular limestones, in beds of from six to twelve inches thick, showing less green shale than before. The beds are well stored with the fragments of crinoidal columns, which almost entirely compose some of them	11	9
Shortly before reaching the upper part of the previous deposit several small undulations occur in the strata, but the effect of them being visible, allowance has been made for the repetitions they occasion.		
The remainder of the section being taken from a part where the effect of the undulations is not so easily followed, the sequence is not so certain.		
Yellowish-white granular limestone, in beds of from six to twelve inches thick, consisting of a mass of organic remains, of which crinoidal columns constitute by far the larger part; but other fossils are met with, among which are *Catenipora escharoides*, *Favosites*, *Cystiphyllum*, *Atrypa reticularis*, *Cyrtia*, two species of *Cyclonema*, *Bumastes Barrienses*, *Sphærexochus*	4	6
Yellowish-white limestones, in beds of from twelve to eighteen inches thick; the surfaces of some of the beds show crinoidal columns well weathered out, some of which are three quarters of an inch in diameter. Among the fossils are *Favosites*, *Catenipora escharoides*; *Atrypa reticularis*, and two species of *Cyclonema*	11	6
South-west Point Lighthouse stands on the beds last given.		
	69	3

This is the highest series of strata met with on the island, and its lithological character is so well marked that it is scarcely possible to mistake it for any of those which preceded. Proceeding eastward from South-west Point about three miles, to a place called the Jumpers, a cliff of about thirty feet in height presents itself, where it appears to me probable the junction of the Divisions E and F is seen, the base belonging to the one and the summit to the other. The beds in ascending order are as follows:

	ft.	*in.*
Light grey argillaceous limestone, slightly bituminous, in beds of from half an inch to three inches thick, interstratified with greenish colored shale; among the fossils observed *Pentamerus oblongus* and *Atrypa Reticularis* were the most abundant.....	8	6
Greenish calcareo-argillaceous limestone, slightly bituminous, in beds of from half an inch to two inches thick; the shale constitutes about two-thirds of the mass, and crumbling in the atmosphere, allows the the exposure of well defined fossils in high relief on the surfaces of the limestone beds. Among the fossils in addition to corals, briozoa, crinoidal columns, and te acules, are *Atrypa reticularis. A. hemisphæria, A. naviformis, Leptæna transversalis, Pentamerus oblongus, P. lyratus, P. levis, Platyostoma hemispherica, Pleurotomaria, Murchisonia subulata, Orthoceras, Beyrichia* and *Calymene Blumenbachii*.....	10	6
Dark ash-grey limestone, in some parts mixed with yellowish-white and in such parts of a granular texture: the whole occurring in beds of from one to three inches thick, interstratified with thin beds of greenish shale. The deposit is characterized by an abundance of corals and encrinites; among the corals are *Catenipora escharoides, Favosites favosa, F. gothlandica, F. multipora. Zaphrentis, Stromatopora concentrica;* and among the other fossils are *Pentamerus oblongus* and *Atrypa reticularis*.....	10	6
	29	6

It is not improbable that the south is occupied by the rocks of Division F, from South-west Point to the vicinity of Chicotte River, a distance altogether of about thirty miles; without further examination, however, it cannot be so stated with certainty; for while there is an interval of seventeen miles beyond the Jumpers, in which only one exposure could be discerned from the boat, there was a further distance of seven miles in which four exposures were seen but remained unexamined in consequence of our not being able to land at them from

the condition of the surf. A landing however was effected in a cove under two miles west from Chicotte River, and the cliffs which were examined on both sides of the cove exhibited the yellowish-white granular crinoidal limestone of this division.

The rock there formed cliffs, exhibiting about thirty feet of the strata, which appeared to be somewhat disturbed, as the strike and dip were very irregular, the inclination sometimes amounting to so much as twelve degrees.

These beds extend to within about half-a-mile of Chicotte River, and as no instance of them was observed between that and Cormorant Point, and all the exposures met with presented strata resembling those of the immediately subjacent division, it is concluded, as has already been stated, that this stretch of the coast belongs to it.

Continuing eastward from Chicotte River, the first of these exposures occurs at the distance of about two miles and a-quarter, the next commences about seven and a-half miles farther on, being about two miles beyond Pavillion River, where about seven feet of drab-colored limestone in horizontal strata are seen, with an interval of concealment which continues for a mile, reaching nearly to Martin Brook. The next exposure is on the east side of the cove receiving Iron River, the distance from the last being about a mile and a-half. Here about ten feet are displayed in a low cliff, and the strata still horizontal run along the coast for three-quarters of a mile.

Six miles beyond this occurs Chaloupe River, where cliffs are seen at each horn of the bay at its mouth, separated about half-a-mile from one another. The cliffs expose from twelve to fifteen feet of limestone in horizontal strata which, with an interval of concealment, continue for a mile and a-quarter to the eastward. A mile and a-half further, there is another cliff of horizontal limestone shewing ten feet, and three miles on still another in which twelve feet are seen. These run along the coast for a mile and a-half, and after an interval at the mouth of a brook, they are repeated in a cliff of from twenty to twenty-five feet and continue for a mile. The next display occurs about five and a-half miles further on, commencing within three-quarters of a mile of the extremity of South Point,

and continuing, with an interval at the point, for three-quarters of a mile beyond it. The strata as before, are flat, and they exhibit the following section in ascending order:—

	ft.	*in.*
Grey limestone in beds of from two to four inches thick, interstratified with grey argillo-calcareous shale; among the fossils are *Atrypa reticularis, Leptæna subplana, Calymene Blumenbachii and Orthoceras*.....	6	6
Grey limestone crowded with *Pentamerus oblongus* of large size, to the exclusion apparently of other fossils; nine-tenths of the bed are made up of them, and some of the individuals measured nearly six inches in length.....	0	9
Grey limestone in beds of from one to six inches, with *Orthis flabellulum* and *Calymene Blumenbachii*.....	7	0
Grey limestone holding *Pentamerus oblongus* in abundance, but of small sizes, varying from a-quarter of an inch to an inch and a-half in length; no other fossil was observed.....	0	5
Drab colored limestone in beds of from one to three inches, interstratified with greenish-grey shale, constituting one-fourth of the mass; the shale crumbles under the influence of the weather and yields very perfect fossils; among them are a *Favosites* with small tubes, *F. favosa, Zaphrentis bilateralis, Atrypa reticularis, A. hemispherica, Orthis elegantula, O. flabellulum, Spirifer radiatus*, small individuals of *Pentamerus oblongus, Leptæna subplana, Calymene Blumenbachii, Encrinurus punctatus, Orthoceras* and crinoidal columns.....	14	0
	28	8

A little under half-a-mile beyond this, another cliff of limestone occurs, which runs along the coast for as much more, and probably repeats a part of the section given, the height of the cliff being twenty feet.

The strata in the exposures for twenty-four miles up to this point appear to be perfectly horizontal, but the next exhibition on the east side of a small cove, shows a gentle dip to the south-east. The beds form a fifteen feet cliff of limestone, running for about half-a-mile along the coast, and terminating at the extremity of a point. At the next exposure, however, which occurs after an interval of concealment of six miles, they are once more horizontal, and compose a cliff again fifteen feet high, which occupies a mile of the coast; at a mile beyond this the calcareous strata which present themselves show a dip S. 25° E. $<3°$, which after another mile becomes S. 47° E. $<1°$; the

beds in the last case being superior to those in the preceding one. This dip prevails for about three-quarters of a mile, in which the coast runs oblique to the strata, and then from a dislocation or a twist in the stratification, it very suddenly changes to S. 60° W., which is maintained for about a-quarter of a mile across the measures, along a small cliff occupying that distance. Another concealment of about a mile and a-half brings us to the horizontal limestones which have been already mentioned as existing three miles west of Cormorant Point.

ECONOMIC MATERIALS.

The substances fit for economic application met with on the island are confined to building stones, grindstones, brick-clay, peat, and shell-marl; metalliferous minerals, as far as my observations went, appear to be wanting. The only ore observed appeared to be loose pieces of magnetic oxyd of iron, most probably transported from the Laurentian series on the north shore of the St. Lawrence; there is no reason, however, for asserting that bog iron ore may not be hereafter found.

Building Stones.—In the immediate neighborhood of South-west Point, coarse granular limestone for building purposes is displayed in abundance among the strata belonging to Division F. It occurs in beds of from six to eighteen inches in thickness, is easily dressed, and yields good blocks of a yellowish-white color. The lighthouse at the point is built of it, and so is that at Heath Point, both of which, notwithstanding the coarse and rather open texture of the stone, have stood for upwards of seventeen years, I believe, without showing signs of decay.

The sandstone of Cape James and Table Head would afford a fine material for building purposes; it has a good warm color, being a greenish-gray approaching to drab, rather lighter than the sandstone of Craig Leith quarry, near Edinburgh; it has a free grain, and would therefore dress easily, while the angular fragments on the beach show that it would retain its sharp edges. Blocks of every required size might be obtained with thickness up to five and a-half feet. One solid mass of it which had fallen from Cape James, lay on the beach, measuring forty

by sixty feet, with a thickness of five feet, and must have contained upwards of 12,000 cubic feet of good workable stone. In the two cliffs which have been mentioned, the bed occupies seven miles of the coast, and its proximity to the sea offers a very easy means of transport to the towns and cities of the St. Lawrence.

Grindstones.—The same sandstone would very probably yield very good grindstones; although slightly calcareous, it is even grained, and there is a sufficient amount of clear sharp grit in it to render it available, while there would be no difficulty in getting any sizes of grindstones that might be required.

Brick Clay.—Clay fit for common red brick exists in some abundance; it was observed of a bluish-grey color, and about ten feet in thickness, half-a-mile up the Otter River, on the south side; and I was informed of its existence up the Beesie River. About five miles of coast in the vicinity of St. Mary's River consists of clay cliffs of from sixty to seventy feet in height, and no doubt much of it might be made available for bricks; some of it, however, is of a calcareous character, and contains many pebbles of limestone, fitting it probably for agricultural rather than manufacturing purposes.

Fresh-water Shell-marl.—This material appears to exist in considerable abundance on the island; the bottoms of all the ponds or small lakes that were examined, with the exception of such as were surrounded by peat, were more or less covered with it. Marl Lake is one of these; it has a superficies of about ninety acres, and although the depth of the deposit was not carefully sounded, its thickness appeared to be considerable. The brook which empties the lake into Indian Cove at the west end, carries down a large quantity of the marl as a sediment to the sea, where it becomes spread out for a considerable space over the rocks of the vicinity.

About three miles west from South-west Point, marl was observed to occupy a position on the bank of a brook, and to extend for a-quarter of a mile inland, presenting a thickness of about a foot covered with peat.

In a lake half-a-mile further inland, it covered the bottom over an area of 200 acres; and on the east side of South Point

it was observed reposing on rock close to the shore, covered over by from four to ten feet of peat.

Peat.—Along the low lands of the south coast of the island, from Heath Point to within eight or nine miles of South-west Point, a continuous peat plain extends for upwards of eighty miles, with an average breadth of two miles, giving a superficies of upwards of 160 square miles, with a thickness of peat as observed on the coast of from three to ten feet. On the average this plain may be fifteen feet above high-water mark; and by channels cut through it could be easily drained and faced for working. As far as my knowledge goes, this is the largest peat field in Canada, and the general quality of the material is excellent.

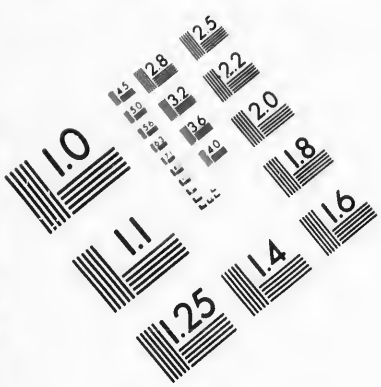
There are many isolated patches also between South-west point and the west end, varying in size from 100 to 1000 acres, which would yield a considerable quantity of the material.

It was stated to me that peat existed also in some abundance in the interior of the island, but this I am disposed to doubt, for while all the streams flowing from the peat plain, on the south side gave as is usual a brown colored water, those in other parts were pure and colorless, leading to the opinion that the interior was peculiarly free from peat swamps.

Among the materials of the island which may be considered of an economic nature though not of a mineral character, sea-weed and drift-timber may be enumerated.

Sea-weed.—In all the bays, coves and sheltered places around the whole island, with the exception of those between the east end and South-west Point, there is a great accumulation of sea-weed along the high-water mark; in such places patches of it are met with of from a hundred yards to half-a-mile in length, and from two to six yards in width; the depth usually varied from one to four feet, and in some instances was six feet. The beneficial effect of sea-weed as a manure is too well known to require mentioning, but to what distance it would bear carriage for such an application is more than I am able to state. On the island, Mr. Pope, of South-west Point, makes use of it as a fertilizer for his fields, mixing it with the peat which forms the soil.

Drift Timber.—The quantity of squared timber and saw-logs



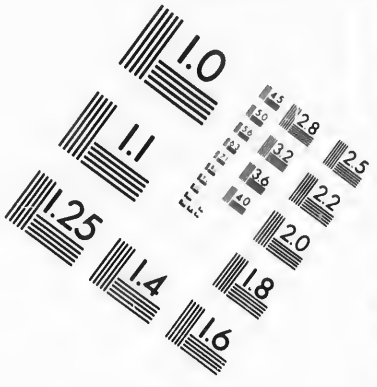
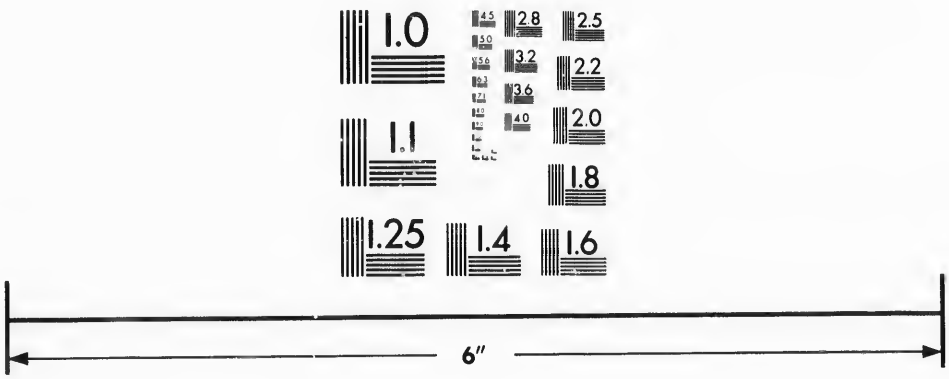
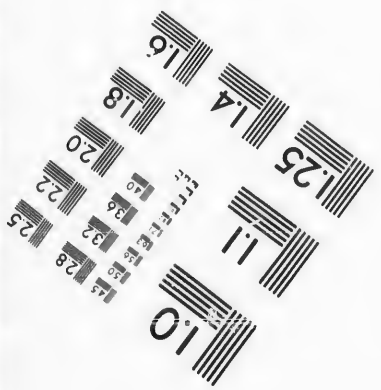
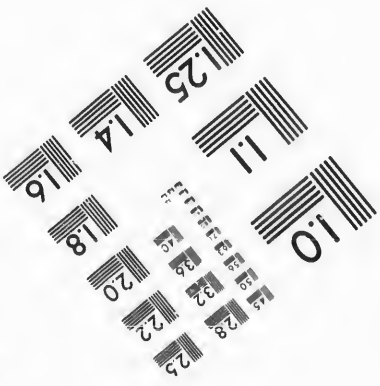


IMAGE EVALUATION TEST TARGET (MT-3)







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which are scattered along the south shore of the island, is very surprising; the abundance appears to be greater towards the east end than the west; but according to the calculation which I have made, if the whole of the logs were placed end to end they would form a line equal to the whole length of the island, or 140 miles; this would give about one million of cubic feet. Some of the squared timber may have been derived from wrecks, but the great number of saw-logs, which are not shipped as cargo, induces me to suppose that the main source of this timber is drift.

No doubt the whole of it may have once been private property, and perhaps much of it could be identified as such by private marks; perhaps, too, no one may have a right to touch it but the owners of the island, to whom it may be a *waif;* but it is to be regretted that it should be allowed to remain on the shore to rot, as much of it has no doubt done. The captain of a fishing schooner that had not been very successful in taking fish, applied to me, when I was leaving Heath Point, to know where the greater accumulation of it might be found, expressing an intention of cutting some of the squared timber into convenient lengths, and loading his vessel with it for Nova Scotia. More may, perhaps, be in the habit of pursuing a similar trade.