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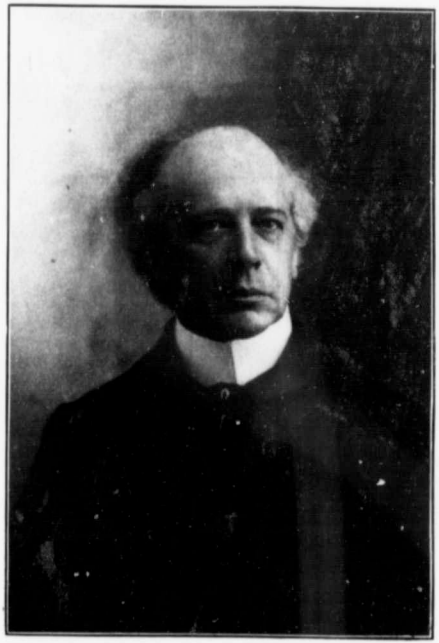

THE RIGHT HON. SIR WILFRID LAURIER, G.C.M.G., Etc.
PREMIER OF CANADA.

THE HONORABLE RAYMOND PREFONTAINE
MINISTER OF MARINE AND FISHERIES.

LIEUT.-COLONEL FRANCOIS FREDERIC GOURDEAU
DEPUTY MINISTER OF MARINE AND FISHERIES.

THE CANADIAN MARINE

A History of the Department of Marine and Fisheries

WHAT THE DOMINION GOVERNMENT HAS DONE TO FOSTER THE MARINE AND FISHING INTERESTS IN THE PAST, AND WHAT IS AT PRESENT BEING DONE BY THE DEPARTMENT IN THE WAY OF CHANNEL IMPROVEMENTS, AIDS TO NAVIGATION AND PROTECTION TO THE FISHERIES. : : : : : : : : : : : : :

PUBLISHED WITH THE APPROVAL AND AUTHORIZATION OF

THE HONORABLE RAYMOND PREFONTAINE (Minister of Marine and Fisheries)

AND COMPILED WITH THE ASSISTANCE OF THE OFFICIALS OF THE DEPARTMENT

BY

CAPTAIN ERNEST J. CHAMBERS

CANADIAN MARINE AND FISHERIES HISTORY, PUBLISHER
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PREFACE

IT is doubtful if there are any of the Dominion's natural resources more valuable to our people or more essential to the national well-being than her great inland waterways, her deeply indented sea-coasts and her splendid geographical position, which latter gives her such a commanding position with regard to the ocean carrying trade.

There is no doubt that the most has not been made of Canada's great maritime advantages in the past, but the period of inaction in that respect appears to have passed, and pretty general attention is commanded by everything that pertains to the country's shipping interests. While the Canadian people are hopefully looking forward to a great future development of Canadian shipping and to a more thorough exploitation of the Dominion's water routes and her resources of sea and river foods, it is natural to suppose that a volume devoted to an account of those resources, and to an historical sketch of what has been done in the past to develop them, will be received with general interest.

As a matter of fact there is a certain historical glamour or romance connected with the story of Canadian shipping, which makes it interesting in itself.

Perhaps the chief practical value of this volume lies in the records of what the Canadian government has done and is now doing to develop the country's maritime interests.

Although the work of the Department of Marine and Fisheries excites a measure of general attention, it has received in the past much less public consideration than it has deserved.

In view of the paramount importance of the shipping interests of Canada, it is impossible to overstate the necessity of supplementing by aids to navigation the Dominion's exceptional natural facilities for the development of the marine transportation system.

With the recent extension of the scope of the department by the delegation to it of the work of deepening and maintaining the St. Lawrence Ship Channel and kindred works properly pertaining to the Marine and Fisheries Department, but hitherto in charge of the Public Works and other departments, the Marine Department has, during the past year or two, been reorganized on a more comprehensive basis. The present time certainly appears opportune for the publication of a history of the work of the Department from its organization.

In this volume the chief public works undertaken by the Dominion Government to aid navigation, inland or sea-wise, are passed in review, and descriptions given of improvements to navigation accomplished and in contemplation.

Additions to existing aids to navigation now being introduced are so numerous and so important in character that when completed they will amount almost to a complete revolution in the service. More powerful lights are being installed in lightships and lighthouses, and more powerful foghorns in signal stations. Great lightships of powerful design and complicated equipment are already built, or are projected, to be stationed far out at sea, where a few years ago it was considered impossible for any vessel to ride at anchor. With the installation of automatic gas buoys, a submarine signal system and wireless telegraph, it seems as if even witchcraft itself were destined to be enlisted in the work of making easier and safer the navigation of Canadian waters.

For assistance in the preparations of this volume the writer is indebted to the Hon. J. Raymond Prefontaine, Minister of Marine and Fisheries, for his kindly interest, and the instructions given to his officials which resulted in the obtaining of a great deal of valuable departmental information. And to the officials of the department, particularly to Lieut.-Col. Gourdeau, the Deputy Minister, to Commander Spain, R.N., Mr. J. F. Fraser, Commissioner of Lights, and to Mr. Wm. Stumbles, thanks are due and gratefully tendered.

The writer must also express a lively sense of his obligations to Dr. A. G. Doughty, C.M.G., Dominion Archivist, and his staff, and to Messrs. Sylvain, Bouchette and McCormick, of the Parliamentary Library, for assistance rendered.

ERNEST J. CHAMBERS.

OTTAWA, Nov. 30th, 1905.

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CHAPTER I.

Canada's Natural Maritime Advantages.

THE DOMINION'S EXTENDED COAST LINE—HER INNUMERABLE HARBORS AND UNRIVALLED INLAND WATERWAYS—LAKES AND RIVERS WHICH CONTAIN MORE THAN HALF THE FRESH WATER ON THE GLOBE.

FAVORED by nature in so many respects, Canada has no more valuable natural asset than the heritage of the extended coast lines and the unrivalled systems of inland waterways which appear destined to make her one of the greatest maritime nations of the world.

Not only do the exceptional natural facilities for inland traffic and ocean trade afford ready and economical means of communication between the distant parts of this great confederation of British American provinces, and facilitate the means of marketing the products of the Canadian grain fields, mines, and forests; they are attracting to Canadian routes an ever-increasing proportion of the carrying trade of the North-western States, in many respects the most productive section of the United States.

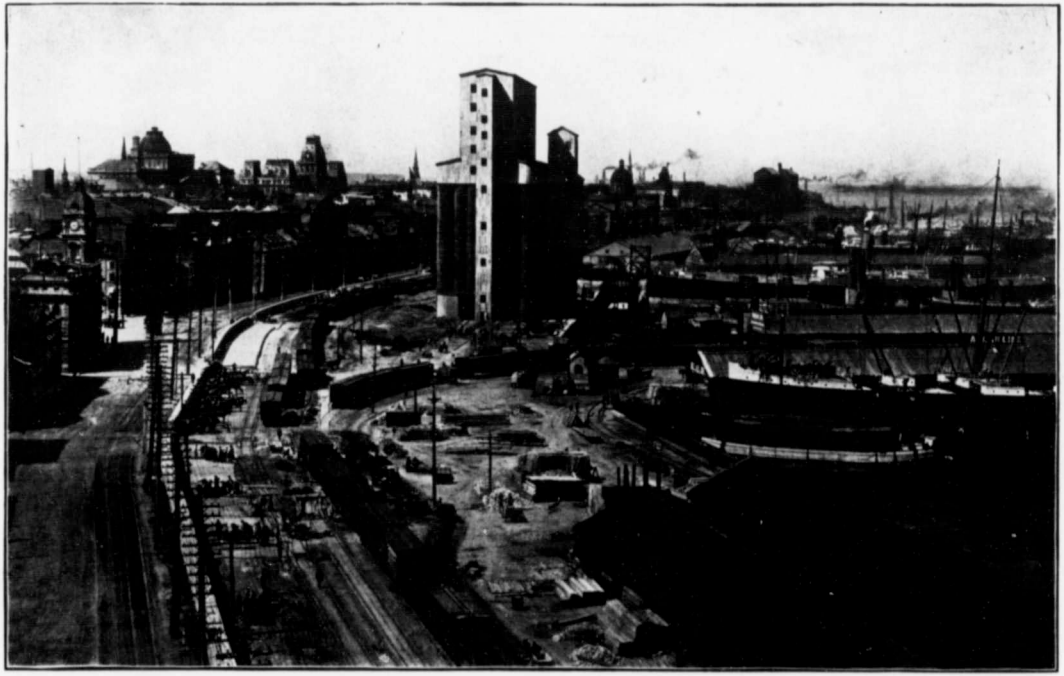
The natural market for the surplus production of North America, —Canada as well as the United States,—is Europe, and trade seeks the shortest route between producer and consumer. The chief sea-port of Canada, Montreal, although 986 miles inland, and even although 250 miles above salt water, is 315 miles nearer to Liverpool than the chief sea-port of the United States, New York. And likewise Sydney, Halifax, St. John and all of the other Atlantic coast ports of Canada are from 600 to 900 miles nearer to Europe than New York, Boston, Portland, Philadelphia, Baltimore, or any other of the United States ports. The Canadian mail steamships, though not specially constructed and subsidized to make record-breaking passages, now carry their passengers between Moville and Rimouski, or in winter between Moville and Halifax, where the mails are landed, in about the same average time as the United States lines do between Queenstown and New York. The tremendous geographical advantage possessed by Canadian seaports is of course due to the inclination of the North American coast line as it extends northward towards the east, and to the shortening of the circles of latitude the more distant they are from the equator. Fort Churchill on the western coast of Hudson Bay, right in the heart of the continent at its broadest part, being in fact further west than Minneapolis, is actually 637 miles nearer to Liverpool than New York, the figures being 2,926 miles as against 3,563 miles.

The following figures give distances between important Canadian and American ports and British seaports:

	Miles.
Rimouski to Moville	2,490
Halifax to Moville	2,340
St. John to Moville	2,600
Montreal to Moville	2,786
New York to Queenstown	2,795
New York to Southampton	3,110
Montreal to Quebec	139
Quebec to Rimouski	157
Montreal to Rimouski	296
Moville to Liverpool	190
Queenstown to Liverpool	253

A glance at the map is all that is necessary to obtain an idea of the wonderful harbor accommodation obtainable around the coasts of Canada, due to the markedly indented character of the shore lines. Hudson Bay on the north is really a great inland sea, with James Bay at its southern end. It is 1,250 miles in its greatest length and 550 miles in greatest breadth. The eastern sea-coast of the Maritime Provinces, from the Bay of Fundy to the Strait of Belle Isle, covers a distance of 5,600 miles, while the western sea-coast of British Columbia is reckoned at 7,180 miles; the fresh water area of that part of the Great Lakes belonging to Canada is computed at 72,700 square miles, not including the numerous lakes of Manitoba and the North-West Territories.

Unquestionably the most prominent physical feature of the Dominion is its marvellous system of inland waterways. Canada contains very much more than half of the fresh water upon the globe. The St. Lawrence River, with its vast lacustrine expansions, which are really fresh water seas, is perhaps the most marked, as it is one of the most useful physical features of the country. Lake Superior has a water surface area of 31,800 square miles; Lake Huron, 23,200; Erie, 10,030; Ontario, 7,260; Lake St. Clair, 445; and Lake Simcoe, 300. Altogether the area of lake surface connected with the St. Lawrence is over 75,000 miles. And to the west and north-west of the St. Law-



CANADA'S NATIONAL PORT—VIEW ABOUT THE CENTRE OF THE HARBOR OF MONTREAL

rence system are other vast lakes, such as the Great Slave Lake, with an area of 10,000 miles; Lake Winnipeg, 9,400 miles in area; Lake of the Woods, 1,500 miles; Lake Manitoba, 1,900 miles; Great Bear Lake, 11,200 miles; Athabasca, 4,400 miles; and Lake Winnipegosis, with a surface area of 2,030 square miles.

The River St. Lawrence, with its lakes and unrivalled system of ship canals, enables shipping to penetrate 2,384 miles into the heart of the continent; and its chief tributary, the Ottawa, has a length of no less than 780 miles. The water route from the Atlantic via the St. Lawrence system to the head of Lake Superior is within a hundred miles as long as that traversed by steamships between Canadian and an Irish port. The total area of the United Kingdom, including its adjacent islands, is 120,979 square miles, while the water area of Canada alone totals 140,736 square miles without including Hudson's Bay, which itself has an area of 350,000 square miles, and has an extreme length of 1,250 miles and width of 600 miles, while the distance from John o' Groats to Land's End is but 628 miles

The Provinces of the East, or the Acadian region, have rivers of large size. The St. John River drains an area of 26,000 square miles, one half of which is in the Canadian Province of New Brunswick. Other rivers of considerable magnitude are the Restigouche and the Miramichi.

West and north of the St. Lawrence River and its tributaries are many rivers of large size. In the Territories and Manitoba are the Mackenzie (2,400 miles in length), the Copper Mine and Great Fish Rivers, which flow into the Arctic Ocean; the Saskatchewan River (1,500 miles); the Red River and its tributary, the Assiniboine, which flow into Lake Winnipeg, discharging thence through the Nelson River and the Churchill; the Haye and other rivers, which flow into the Hudson Bay, draining into it the waters of an area estimated at 370,000 square miles. In British Columbia are the Fraser River and the Columbia (1,200 miles), and in the Yukon District is the Yukon River, 2,300 miles long, which carries off the surplus waters of a great tract of country in Canada before flowing into the sea on the western side of the United States District of Alaska. Connected with these and other rivers are lakes of large size. Lake of the Woods (1,500 square miles), Lake Manitoba (1,900 miles), Great Bear Lake (11,200), Great Slave Lake (10,000), Athabasca (4,400), Winnipeg Lake (9,400), Winnipegosis (2,030).

The following table gives an idea of the size of the chief lakes of Canada:

	Length Miles	Breadth Miles	Depth Feet	Elevation above Sea	Area in Square Miles
Lake Superior	460	170	800	600	31,500
" Michigan	330	90	700	576	22,000
" Huron	260	110	700	574	21,000
" Erie	250	60	200	565	9,000
" Ontario	180	60	600	235	6,400
" Winnipeg	280	30	...	650	8,500
" Manitoba	120	16	...	670	1,900
" Winnipegosis	120	17	...	692	1,936

The great advantage possessed by Canada over her older and more populous neighbor to the south with respect to natural means of communication received eloquent demonstration at an early stage of the Continent's development. Exploration, like everything else, moves along the lines of least resistance and greedily seizes advantage of the most feasible routes. And so it happened that the first parties to penetrate to the centre of North America, to discover and explore the Great Lakes, the Mississippi, the vast western prairies and the Rocky Mountains, were composed of colonists of New France, then a very insignificant outpost so far as regards population compared with the thriving colonies of New England, Maryland, Virginia and New Amsterdam.

The importance of Canada's superior natural means of communication made a great impression upon the mind of Sir William White, past-president of the Institute of Civil Engineers of Great Britain, during his recent visit to Canada with the members of that important body, and since his return to England he has placed on record the following opinion: "The profound penetration and permeation of the country by waterways is the great characteristic of Canada. The extent of the shipping and trade of the lakes is hardly realized here, or the importance attaching to possession of traffic from the lakes to the open sea."

CHAPTER II.

Canada's Shipping.

SOME HISTORICAL AND STATISTICAL DATA ABOUT THE DOMINION MERCHANT MARINE—THE PIONEERS OF THE TRANS-ATLANTIC STEAM SERVICE, AND OF BOTH SAIL AND STEAM NAVIGATION ON THE GREAT LAKES.

THE possessor of such unrivalled natural facilities for maritime enterprise, and populated by the descendants of races remarkable for their nautical skill and inclination, one would naturally look to Canada for an interesting maritime history and for an extensive mercantile marine. And both are to be found.

The first flag to float over any port of what is now the Dominion of Canada in token of sovereignty was the English flag flying over the "Matthew," Captain John Cabot, June, 1497, off the coast of Cape Breton. Jacques Cartier, the entrepid French navigator, sailed up the St. Lawrence in 1534. The first vessel built in what is now Canada was laid down at Port Royal, Nova Scotia, June, 1606. In 1607, Pontgrave built in the Annapolis River a bark and a pinnance to replace those cast away. The first sea-going vessels in New France were built in 1668, under the direction of M. Talon, the Intendant. As early as 1723 shipbuilding was an established branch of industry in old Canada, six merchant ships and two men-of-war having been built in the Colony during the year. In 1752 a 74-gun ship was built at Cape Diamond, Quebec. (Johnson's Alphabet of First Things in Canada.)

The first European who accomplished the ascent of the St. Lawrence from the Atlantic to Lake Ontario was M. de Courcelles, in 1670. He did so in furtherance of the policy that was being pursued by France to secure the fur trade with the Indians in the north and north-west of the American continent. About three years later than this a young French traveller, Sieur la Salle, arrived in Canada full of a project of discovering a route to Japan as well as to the East Indies by penetrating further and further to the west until he reached "the northern seas." He disclosed his plans to Frontenac, who had succeeded De Courcelles as Governor of Canada, and quite won him over to his views. Furnished by Frontenac with letters of introduction to influential people at the French Court, he returned to France, and while there obtained from the monarch a grant of the seignory of Cataraqui, together with the exclusive right to trade in the west, and full liberty of exploration. Armed with these extensive powers, in 1678 La Salle returned to Canada, and for about a year employed himself in building fortresses at Cataraqui in constructing ships on Lake Ontario, and in commercial transactions with the Indians.

The first sailing vessel built upon Ontario was a small schooner of about ten tons burden, constructed at the "Cabins," where Kingston is now. Upon this vessel on November 18th, 1678, La Salle sailed from Cataraqui, his destination being the mouth of River Niagara. He had as his companions Father Hennepin and Chevalier de Tonti, and on his vessel carried both merchandise and the materials for constructing a ship. Soon after entering Niagara River, La Salle and Father Hennepin, with their small craft, were brought to a stand at the head of the eddy at Queenston, where lies a large rock, which is to the present time distinguished as Hennepin Rock. Their vessel was wrecked, and the rigging and other stores for the "Griffon" were lost, though the anchors and cables were saved. This wreck took place at Thirty Mile Point, where there is a very bad shore.

Once more La Salle returned to Frontenac and again by another vessel shipped fresh stores and supplies for the "Griffon." The name of this ship is not given, but the other was known as the "Frontenac."

There is much difference of opinion as to the exact locality where the "Griffon" was built but it was probably at Cayuga Creek (two leagues) six miles above the falls, for small spikes and other small articles of rusted iron were frequently found there some years ago.

The following spring (1679) she was launched. Five small cannon looked out from her port-holes, and on her bow was carved a portentious monster, the "Griffon," whose name she bore, in honor of the armorial bearings of Frontenac (Parkman).

The "Griffon" is described as "a kind of brigantine, not unlike a Dutch galliot, with a broad, elevated bow and stern, very flat in the bottom, looking much larger than she really was and of sixty tons burden.

In 1679, accompanied by Father Hennepin, who was a Flemish Recolet, and had come from France with him, La Salle on August 9th entered Lake Erie on board the "Griffon," this being the first ship which had ever floated upon its waters. He sailed from end to end of it, and going through the Straits of Detroit, he then entered a beautiful sheet of water, to which he gave the name of Lake St. Clair. Passing thence through the narrow channel he reached Lake Huron. Standing on, the south side of the strait between Lake Huron and Michigan, was reached, the voyage coming to an end in one of the bays to the north of the latter lake. La Salle remained in the North-West for some time longer, but he sent the "Griffon" back laden with valuable furs,

and she is supposed to have foundered, as nothing more was ever heard or any trace found of her.

In 1705 a large frigate was built in Nova Scotia.

Alexander Henry and his associates built the first vessel that sailed on Lake Superior, a 40-ton sloop, in their shipyard at Point Aux Pins, 1770-72. Before that date the traders used canôtes de maitre which carried much cargo and were paddled by fourteen or sixteen men.

The first vessel built in New Brunswick was in 1770, and in St. John, N.B., in 1775. This latter was destroyed while on the stocks by rebels from across the line, who in turn were destroyed by a body of men from Port Royal

The first vessel built on the North Pacific coast was a 40-ton vessel, built by Captain John Mears, and launched at Nootka in 1786 (Dr. George Johnson's Alphabet of First Things in Canada).

The first ship considered remarkable for its large size built in Canada was the "Columbus." It was built in 1826, on the Isle Orleans, a lumber ship, four masted, 300 feet long, 50 feet beam and 30 feet hold, with a measurement of 4,000 tons. The arrival of this vessel in the River Thames excited much interest. The Duke of Clarence, then Lord High Admiral and afterwards King William IV., with a distinguished company of 100 guests, was entertained on board. The "Columbus" was followed by the "Baron of Renfrew" of about the same dimensions. These vessels were built to enable their owners to get the timber in free of duty, ships being then free and timber being dutiable in England.

In 1752 ten ships of from 40 to 100 tons were built in New France, or old Canada and there were some sixty saw mills east of the Ottawa largely engaged in producing lumber for the ship yards in the colony and in France.

For many years after the cession to Britain, Canada made rapid strides in ownership of vessels, and in 1878 reached her highest point, having in that year 133,015 tons, of shipping on her registry books.

During previous years the tonnage of vessels built in Canadian shipyards was as high as 191,000 registered tons, in 1874. Since that year there has been a decrease, till, in 1896, it fell to 16,146 tons. In 1898 there was a slight revival, the tonnage of new shipping built amounting to 24,522 tons. This was offset to a certain extent by the sale to other countries of 17,210 tons.

The total number of vessels remaining on the register books of the Dominion on December 31st, 1904, including old and new vessels, sailing vessels, steamers and barges, was 7,152, measuring 672,838 tons registered tonnage, being an increase of 132 vessels, and a decrease of 10,309 tons register, as compared with 1903. The number of steamers on the registry books on the same date was 2,543, with a gross tonnage of 353,514 tons. Assuming the average value to be $30 per ton, the value of the registered tonnage of Canada, on December 31st last, would be $20,185,140.

The number of new vessels built and registered in the Dominion of Canada during the year 1904 was 308, measuring 18,554 tons register tonnage. Estimating the value of the new tonnage at $45 per ton, it gives a total value of $834,930 for new vessels.

The reason for the almost complete cessation of the shipbuilding industry is, of course, the change from wooden to iron and steel ships. The reasons for the very great decrease in tonnage owned in Canada are the cessation of building and the sale to other countries, principally Norway.

This state of affairs will soon cease thanks to the development of the iron industry by the encouragement of the manufacture of pig iron. This has been so successfully prosecuted, that, instead of the proportion of home-made pig being 36 per cent. of the whole consumption as it was in 1884, it has been in recent years from 75 to 88 per cent. of the whole. Large and well placed steel works are approaching completion near the ancient site of Louisburg in Cape Breton—the beginning of an effort to adapt ourselves to the changes which have rendered our forests useless for shipbuilding purposes (Dr. George Johnson).

Among the most interesting and most honorable pages of the maritime history of Canada are those which relate to the very prominent part this country played as a pioneer in the development of steam navigation. Here it appears desirable to go back in history to the very origin of the application of steam as a motive power to ships. In 1707, on the River Fulda, in Prussia, a clever Frenchman named Paplin, constructed a boat and had an engine put in her. All went well with the inventor until he ran counter to the river-men, who saw in the invention an end of their trade. They destroyed the vessel and her machinery, and another fifty years went by before a second vessel was built.

This time some Scotchmen took up the project and with better success, but after al their vessel was only a successful toy, and of no practical benefit. The engine of this vessel can still be seen in a museum at Glasgow. In 1801, a craft was actually propelled on the Thames by means of a steam engine, and in the following year the Charlotte Dundas was built, fitted with steam power and launched. The latter vessel was the one which Robert Fulton, the pioneer of steam navigation in the United States, inspected so carefully, and from which he obtained his ideas for the "Clermont," which first plied the Hudson River, between Albany and New York in 1807.

John Molson arrived in Canada in 1782, and after successfully

founding the brewing business which is still carried on by the family turned his attention to the novelty of steam navigation. On the 3rd of November, 1809, the second steamboat in America built at Montreal by Mr. Molson and named the "Accommodation," started on her maiden voyage to Quebec. The venture was entirely successful, the run being made in thirty-six hours. This vessel measured eighty-five feet over all had sixteen feet beam and an engine of six horse-power. Sixty pounds of luggage were allowed to passengers, and they were requested to purchase their tickets early in order to allow of sufficient provisions being laid in.

In the following year (1810) Mr. Molson applied for a monopoly for fifteen years, and in 1811 began the construction of the "Swiftsure" for the same service.

The following from *The Quebec Mercury* of Monday, November 6th, 1809, announcing the first arrival of the "Accommodation" at Quebec, may now be read with interest, as a curiosity. It was the commencement of an era in the navigation of those inland waters and of the lakes, the progress whereof has exceeded anything that the most sanguine could have expected at the outset:

"On Saturday morning, at 8 o'clock, arrived here, from Montreal, being her first trip, the steamboat "Accommodation," with ten passengers. This is the first vessel of the kind that ever appeared in this harbor. She is continually crowded with visitants She left Montreal on Wednesday, at two o'clock, so that her passage was sixty-six hours, thirty of which she was at anchor. She arrived at Three Rivers in twenty-four hours. She has at present, berths for twenty passengers; which, next year, will be considerably augmented. No wind or tide can stop her. She has 75 feet keel, and 85 feet on deck. The price for a passage up is nine dollars, and eight down, the vessel supplying provisions. The great advantage attending a vessel so constructed is, that a passage may be calculated on to a degree of certainty, in point of time; which cannot be the case with any vessel propelled by sail only. The steamboat receives her impulse from an open double-spoked, perpendicular wheel, on each side, without any circular band or rim. To the end of each double spoke is fixed a square board, which enters the water, and by the rotary motion of the wheel acts as a paddle. The wheels are put and kept in motion by steam, operating within the vessel. A mast is to be fixed in her, for the purpose of using a sail when the wind is favorable, which will occasionally accelerate her headway."

The following extract taken verbatim from the *Montreal Herald* of May 8th, 1813, will give a good idea of the time and incidents of an upward trip on the "Accommodation." On this occasion Sir George Prevost, his staff and servants were on board:

"Journal of the steamboat from Quebec, Tuesday, May 4th, ½ past 4 left Quebec—½ past 11 p.m. came to Port Neuf. May 5th, ½ past 5 p.m. (a.m.) got under weigh—at ½ past 5 p.m. past Three Rivers —at 9 p.m. anchored opposite Riviere du Loup—May 6, at ½ past 4 a.m. got under weigh and made sail—at 8 a.m. hove to off Wm. Henry. Landed three passengers and sent the boat ashore for milk. At 9 a.m made sail—at 4 p.m. arrived at Montreal. Remarks, past every vessel under sail."

The "Accommodation" was actually the first steamboat to be built and engined in America, the engines of Fulton's steamer "Clermont," having been constructed in England. The "Accommodation," was completed throughout in Montreal.

Previous to the appearance of the "Accommodation" on the St. Lawrence, the mail between Quebec and Montreal took three days.

The first sailing vessels to plough the waters of the Great Lakes were of Canadian build and so were the first steamers to ply there.

Up to the close of the revolutionary period the vessels afloat on the lakes were of government ownership and generally employed on naval and military duties. In the summer of 1793 there appeared on Lake Ontario for the first time the premier merchantman built in Upper Canada. She was named the "York," and had been constructed on the River Niagara in the previous year, 1792. Several other vessels were built during the next few years, all appearing to have plied on the route between Kingston and Niagara. The passage from Niagara to Kingston generally took thirty-six hours to accomplish, but occasionally it took no less than forty-eight, and even longer.

About 1795 there was running on Lake Ontario between Kingston and Oswego and Niagara, a schooner named the "Sophia." She appears to have been a quick sailor, as she accomplished one voyage between Kingston and Niagara in eighteen hours. Americans purchased a Canadian vessel known as the "Detroit" in 1796, and she plied for some time on Lake Erie, but until the following year (1797) there were no United States built ships afloat either upon Lake Ontario or Erie.

The first steamboat on Lake Ontario, the "Frontenac," was built upon the shores of the Bay of Quinte, at Finkle's Point, Ernestown, eighteen miles from Kingston, and within the corporation of Bath. She was commenced in October, 1815, and launched the following season. The three years of war had caused many changes in Upper Canada. On the whole it may be said that the war materially benefitted the province.

"After peace things did not relapse into their former state. A spirit of enterprise was abroad, especially in the mercantile community. The leading men of Kingston conceived the idea of forming a company to build a steamboat to ply on Lake Ontario and the navigable

waters of the St. Lawrence. A company was consequently formed composed of individuals belonging to Kingston, Niagara, Queenston, York and Prescott. The shareholders of Kingston were Joseph Forsyth, Yeomans, Marsh, Lawrence, Kerkimer, John Kirby, Capt. Murney, and William Mitchell. Advertisements were issued for tenders to construct the boat. The advertisement was responded to by two parties, a Scotchman by the name of Bruce, from Montreal, and Henry Teabout, from Sackett's Harbor, the latter being awarded the contract and establishing a shipyard at Finkle's Point to execute the contract. The first steamboat built to ply on Lake Erie was the "Walk-in-the-Water," built at Buffalo about the same time the "Frontenac" was commenced at Kingston, beginning her voyages shortly after the former.

Inland steam navigation was long an accomplished fact before an attempt was made to cross the Atlantic altogether by steam, and here Canada took the lead.

Between the opening of the century and 1831, considerable experimenting was done with steam as a means of propelling vessels across the Atlantic. The "Savannah" was re-constructed at New York in 1818. She was originally a sailing packet, but a 90 horse power engine was afterward installed, and by means of a combination of sail and steam she crossed from Savannah to Liverpool in the spring of 1819, the time consumed in the voyage being 29 days. Her steam power, however, was merely of an auxiliary character and never a serious factor, and eventually it was removed altogether and she became a sailing packet, pure and simple.

In 1825 the "Enterprise," a ship of 500 tons and 240 horse power, was fitted out for the purpose of capturing a prize of ten thousand pounds sterling, which the British Government offered to the vessel making a successful voyage to India with steam power. The "Enterprise" occupied 110 days on the voyage, and steamed 64 days of that period.

This same year, 1825, the necessity was felt in Lower Canada and Nova Scotia for a better means of inter-communication, and at the session of that year the legislative assembly of Lower Canada voted the sum of £1,500 for encouraging the intercourse between Quebec and Halifax, to be given as a premium or reward to the first steam packet of not less than 500 tons burthen, that should run regularly between those ports. The Legislature of Nova Scotia met this appropriation with a corresponding spirit, immediately voting £750 for the same purpose. These votes did not, however, immediately produce the intended effect.

On April 27th, 1831, Lord and Lady Aylmer, accompanied by their suite and a brilliant following were present at Black's shipyard in Quebec to witness the launching of a vessel destined to open up a new departure in steam navigation. Amid the strains of the band of the 32nd Regiment, the "Halifax Steamboat" slid off the ways and was christened the "Royal William" by Lady Aylmer, wife of the Governor-General.

She was then towed to Montreal and received her engines, which were of 200 horse power and built by Bennett and Henderson of Montreal.

The "Royal William" was rigged as a three-masted schooner. She measured 363 tons, and was, of course, a paddle box boat. Her length was 160 feet, breadth between paddle boxes 28 feet, depth of hold 17 feet 9 inches, and her cost was £16,000 sterling. Her owners were "The Quebec and Halifax Steam Navigation Company," which was incorporated by act of legislature to inaugurate the bonused service in accordance with the grant of 1825, between Quebec and Halifax, touching at Mirimichi and other intermediate ports. She sailed from Quebec for Halifax on her first trip August 24th, 1831, making the voyage in six and a half days. The following year she began again upon the same route but on account of the cholera epidemic, and, in spite of the legislative aid, the enterprise not proving profitable, she was put up at the public auction at Sorel and sold for £5,000 sterling. During the summer of 1833, the "Royal William" was employed in the lower river and gulf trade, and finally went on to Halifax and Boston. Her owners decided, however, to send her over to London to be sold, and she sailed for her destination on August 5th of that year. She arrived at Pictou, N.S., on the eighth, and after, coaling, left again on the eighteenth. The voyage from Pictou to Cowes occupied 18½ days; the first vessel to ever cross an ocean entirely under steam. At London the "Royal William" was sold for £10,000 sterling, and was chartered by the Portuguese Government as a transport.

In 1843 she again changed hands, being sold to the Spanish Government, and was made over into a man-of-war and renamed the "Ysabel Segunda," she being the first steam war vessel of the Spanish fleet. Canadians were pioneers, too, in establishing regular steamship services across the Atlantic.

Mr. Samuel Cunard, a Canadian born, a scion from the stock of an old Welsh family, who had emigrated to Philadelphia in the seventeenth century, and who because of their loyalty to King and country, left Philadelphia and settled in Halifax, was present at the launching of the "Royal William," at Quebec, and was deeply interested in her subsequent career. He became a director of the company which owned her. In 1838 he went to England, full of enthusiasm about building and operating a line of steamships to convey the mails, passengers

and Her Majesty's troops between England and Halifax, and trading thence to Boston. Two years were spent in negotiation. He was fortunate in securing the cooperation of George and James Burns, of Glasgow, who were, even at the time, running a line of steamers between Glasgow and Belfast, and Mr. Daniel McIver, another Scotchman, resident of Liverpool. The government was induced to advertise for tenders for steamers to constitute a bi-monthly service in summer, monthly in winter between Liverpool, Halifax and Boston. The subsidy was £81,000 per annum, or £3,295 sterling per round voyage. The following steamers were built on the Clyde to carry out the contract: "Acadia," "Britannia," "Caledonia," and "Columbia." There were two bidders for the contract: The Great Western Company of Bristol and Mr. Samuel Cunard, in conjunction with Burns and McIver, and to the latter the contract was awarded; the line taking the name of the British and North American Steam Packet Company, but popularly known as the Cunard Line, and so it remains to this day. The vessels were built of wood, were side-wheeled, or paddle steamers, and of the following dimensions: Length, 207 feet; beam, 34 feet; depth, 24 feet; registered gross tons, 1,115. Their dimensions and model were similar to those of the "Great Western." The engines, built on what is known as the side lever principle, had for each steamer, two cylinders of 72 inches diameter; 6 feet 10 inches stroke, with 425 horse power, consuming 38 tons of coal in 24 hours, and developing a speed of about eight and a half knots.

In addition to their steam power, they were barque rigged, but the square sails on the main mast were of little use, owing to the close proximity of the funnel. The service was commenced on July 4th, 1840, and has continued without interruption until the present time, being now known as the Cunard Line.

The next step was the building of the "Great Britain," which was placed in service in 1845. She was of the, then, immense tonnage of 3,000 tons, her engines of 1,500 horse power. She was christened on July 19th, 1843, by H.R.H. Prince Albert, who with Her Majesty the Queen, journeyed from Windsor to Bristol to honor the launching. She had one funnel and five masts, and was considered a magnificent ship by the people of that day. The "Great Britain" was not only an iron ship, but she was propelled by a screw propeller; and thus was introduced by this vessel two features that were to revolutionize marine architecture, and which made the then new Cunarders old-fashioned.

As far back as 1746 the screw as a motive power for vessels had been experimented with in England. It was not, however, until 1836 that John Ericsson, the Swedish inventor, who then resided in London, successfully fitted a small steamer with a screw.

The next step in steam navigation which concerned Canada directly was the establishment in 1852 of the Montreal Ocean Steamship Company, and this was the commencement of the regular steamer service between this country and Great Britain. The Allan's, who had been connected with the St. Lawrence trade since 1825, with their clipper ships, were the head of the enterprise, Hugh Allan, afterwards Sir Hugh Allan, being the moving spirit Associated with the Allan's were William Dow, John G. Mackenzie and Robert Anderson, of Montreal; George B. Symes, of Quebec, and John Watkins, of Kingston. Associated with them also were the Scotch members of the Allan family. After a few years the old title was dropped and the line thereafter went under the Allan name.

Two steamers were ordered from William Denny the "Canadian" and the "Indian," not quite so large as the Cunarders of that day, but a little faster (eleven knots as against ten and a half), and every advantage taken of engineering research up to the time they were built. They were built of iron, and were screw propellers. They sailed under canvas equally as well as any sailing ships, the steam power added giving them ability to make regular passages. The "Anglo-Saxon" of the earlier vessels, made the passage from Quebec to the Rock Light, Liverpool, in nine days, five hours, a remarkable passage for the time.

The Allan's received the contract for carrying the Canadian mails in 1855. The service was to be fortnightly, and in addition to the two steamers built in the previous year, the "North American" and the "Anglo-Saxon" were ordered from the same builders, Messrs. Denny & Co., Dunbarton.

In 1858 the service became a weekly one, the Dominion Government increasing the subsidy sufficiently to bring this about. To carry out the new contract four additional steamers were built: the "North Britain," "Nova Scotian," "Bohemian" and "Hungarian." The new steamers were larger than their predecessors, better carriers and with much finer saloons.

An interesting fact is that the Allan's were the first company to sail a steel steamship. The vessel was the "Buenos Ayrean," built at Dunbarton, in 1879, and launched in 1880. Another innovation which the Allan's introduced to the shipping world was the bilge keel, which has a tendency to keep a vessel upright and prevent rolling in a seaway, and which has now been generally adopted on all modern vessels. The same company were also the pioneers in utilizing the turbine engine in the Atlantic service, their steamships "Virginian" and "Victorian," put into commission in 1905, being the first turbine propelled steamships to engage in the trans-Atlantic trade.

It is a remarkable fact that while during the last ten years the mail service from Canada to Great Britain had greatly improved, that between New York and British ports has deteriorated.

In 1895 the Allan mail steamship "Parisian" held the record for the outward passage from Moville to Rimouski in 6 days, 21 hours, 20 minutes, and the homeward passage in 6 days, 14 hours, 22 minutes. The Dominion Line S.S. "Labrador" went from Quebec to Moville in 6 days, 23 hours, and came out upon one occasion from Moville to Rimouski in 6 days, 8 hours. The other fast boats ten years ago were the "Sardinian," "Numidian" and "Mongolian," of the Allan line, and the "Vancouver" of the Dominion Line.

In 1904 the Allan's were for the first time able to maintain a weekly mail service with four steamships instead of five, viz., the twin-screw vessels "Bavarian," "Tunisian," "Ionian," and the re-engined "Parisian." The average passages of the four ships were more than half a day less than in 1895. The "Bavarian" has accomplished the homeward trip in 6 days, 3 hours, and the "Tunisian" the outward trip in 6 days, 4 hours, between Rimouski and Moville; while the "Canada" has reached Liverpool in less than 7 days from Quebec. The triple-screw turbine steamers "Victorian" and "Virginian" built for the Allan's, have already still further reduced the time by the Canadian mail route.

In 1895 the four fastest vessels crossing the Atlantic on the route between New York and Great Britain were the "Campania," "Lucania," "Majestic" and "Teutonic," and the two former still hold the record among British mail boats to United States ports, viz., westward 5 days, 8 hours, 6 minutes, and eastward 5 days, 9 hours, 13 minutes for the "Campania," and 5 days, 7 hours, 23 minutes westward, and 5 days 8 hours, 38 minutes eastward for the "Lucania."

The British Government last year granted a special subsidy to the Cunard Company for the construction of two 24-knot steamships to recover the blue ribband of the Atlantic from the German companies.

Canadian shipping interests on the Pacific Ocean appear to be on the eve of a mighty development.

On the Pacific the Canadian Pacific Railway operates a service of regular mail steamers between Victoria, B.C., and Chinese and Japanese ports, which, in conjunction with the C.P.R. transcontinental railway, makes the Canadian route from Great Britain to the Far East the shortest existing route. There is also a regular service to Australia.

The first regular mail steamships to leave for a Canadian port from Japan and China was the C.P.R. "Empress of India," which left Yokohama on April 17th, 1891, and reached Victoria, B.C., on April 28th, in 10 days, 14 hours, 34 minutes. To test the possibilities of the Canadian route as compared with that via San Francisco, or via the European continent and the Suez Canal, a special train awaited the arrival of the "Empress of India" at Vancouver, and her mail was brought overland, across the 2,906 miles, to Montreal, in 3 days, 17 hours and 35 minutes, and the total time occupied between the Japanese port of Yokohama and London, England, was under 21 days, and this on steamships and over territory over which flies the British flag.

The completion of the Grand Trunk Pacific Railway to the Pacific coast, it is expected, will lead to the establishment of a second Canadian trans-Pacific service.

TRANS-PACIFIC DISTANCES.

Montreal to Vancouver by C.P.R.	2,906 miles
Vancouver to Yokohama, Japan	4,280 knots
Vancouver to Hong Kong, China	5,936 "
Vancouver to Honolulu, Sandwich Islands	2,400 "
Vancouver to Sydney, Aurtralia	6,960 "
Vancouver to Auckland, New Zealand	6,223 "
Vancouver to San Francisco	750 "
Vancouver to Calcutta	8,980 "

During the Confederation debate at Quebec, the Hon. George Brown in the course of his famous speech introduced some figures which are interesting as showing the activity of the Canadian Provinces in shipbuilding.

In 1863, no fewer than 628 vessels were built in British America, of which the aggregate tonnage was not less than 230,312 tons. There were built:

	Vessels.	Tons.
In Canada	158 with	67,209
In Nova Scotia	207 "	46,862
In New Brunswick	137 "	85,250
In Prince Edward Island	100 "	24,991
In Newfoundland	26 "	6,000
Total	628	230,312

In 1861—the year preceding the outbreak of the Civil War—all the vessels built in the United States, with their vast seaboard and 30,000,000 of people, were in the aggregate but 233,193 tons—only 3,000 tons in excess of the British American Provinces.

In 1863 the British American colonies sold ships built by their mechanics to the large amount of $9,000,000 in gold. A table of the vessels owned and registered in British America, made up to the latest dates, showed that the provinces unitedly owned not fewer than 8,530 vessels, with an aggregate tonnage of not less than 932,246 tons.

	Vessels.	Tons.
1864, Canada owned	3,311	287,187
1863, Nova Scotia	3,539	309,554
1863, New Brunswick	891	211,680
1863, Prince Edward Island	360	34,222
1863, Newfoundland	1,429	98,603
Total	8,530	932,246

Canada's merchant marine has the honor to sail under the first regularly authorized British Colonial flag.

The Lords Commissioners of the Admiralty, under power vested in them by the Imperial Merchants' Shipping Colours Act of 1889, issued their warrant, dated February 2nd, 1892, authorizing the merchantmen of the Dominion to use the red ensign of Her Majesty's fleet, with the Canadian coat of arms on the flag. Of course they may use the plain red ensign of the Empire if they wish, but since the permission to fly the Dominion flag was issued, Canadian merchant vessels, the world over, generally fly the flag of the Dominion. Canada is the first of the Queen's colonial dominions to which such privilege has been accorded.

CHAPTER III.

The St. Lawrence Route.

Its Inestimable Value to Canada and Canadian Trade.—How the Obstacles of the Interior Have Been Overcome by the Canals—The Georgian Bay Canal Project.

WITH its main artery extending to the very heart of the most productive part of the North America, and its great tributaries reaching out to quite remote corners of the continent, it is not surprising that the St. Lawrence water system is drawing to itself the trade of an ever-widening area.

So important a national asset is the mighty river, with its great chain of lakes and its maze of tributary streams, that one feels compelled to doubt whether it would have been possible to establish a prosperous, independent nation in the northern part of the continent without its possession. The St. Lawrence not merely affords a route for the trade of the interior, it has always been a chain binding the peoples of the different divisions of the country together; it has been in necessity, and still is, a barrier against the nation's enemies.

The original line of communication commanded by the founders of Canada was the inland water highway. Nature endowed the northern half of North America with the most extensive chain of natural water communication in the world—a maze of mighty rivers and vast lakes, with tributaries stretching out in all directions, and reaching to the watersheds of other great inland water systems, and it was by this chosen highway of nature that there went into the heart of the continent the first white men to explore the Great Lakes, to see the vast prairies of the West, to discover and explore the Mississippi, and to cross the Rocky Mountains to the shores of the Pacific. Exploration, like trade, follows the lines of least resistance.

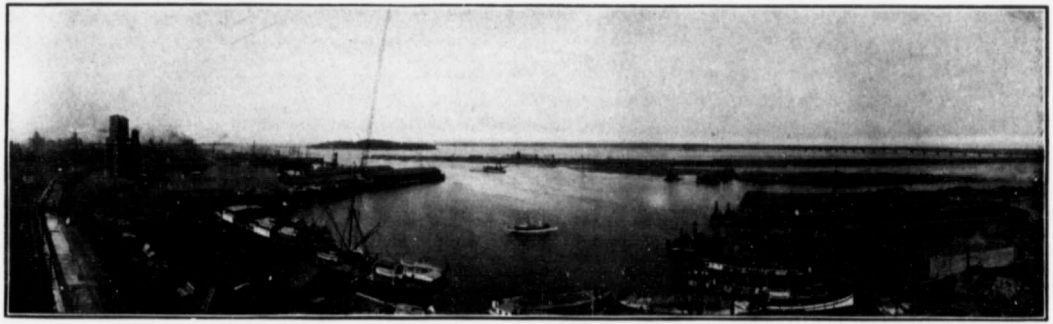
Montreal, the chief port of this route, and the natural gateway of Canada, enjoys the singular distinction of being an ocean port, and a great ocean port, although situated nearly a thousand miles inland. It is exactly 986 miles from Montreal to the Straits of Belle Isle. The city is 250 miles above salt water, and yet it is 315 miles nearer to Liverpool than is the City of New York. A third of the whole distance to Europe by way of the St. Lawrence is in comparatively smooth water.

Westwardly, the distance from Montreal to Chicago by the St. Lawrence system of rivers, canals and lakes, is 1,261 miles, or 158 miles less than the distance from New York to the same city, while the canals of the St. Lawrence system aggregate only 70 miles, against 350 miles of artificial navigation by the Erie Canal to Buffalo.

Not only is Montreal the great importing and exporting point of the Dominion, but she may also be described as the seaport of much of the western part of the United States.

During the seven-month seasons of navigation vessels sail regularly in ever-increasing numbers from Montreal outward to the great ports of England and Scotland; to the West Indies, the Mediterranean; to European Continental ports; to South Africa; to our own Lower Provinces. From Montreal inwards great freight steamers ply the Upper Lakes to far-off Chicago and Duluth, Fort William and Port Arthur.

In providing this natural means of communication, nature did much to assure the future commercial greatness of Canada, but man has had to do his part. Canadians have had to remove certain natural obstacles to make the route available throughout for the requirements of modern commerce. There were shoals in some of the lakes and rivers, and also numerous rapids and waterfalls in the latter. In the



CANADA'S NATIONAL PORT—VIEW OF THE HARBOR OF MONTREAL

SHOWING THE ENTRANCES TO THE LACHINE CANAL

old days the explorers and fur traders carried or portaged their light canoes or batteaux round these obstacles. At present navigation evades them by means of canals and artificial channels.

The following table gives details respecting the St. Lawrence canal system:

	Length Miles.	Locks.	Rise Feet.
Lachine Canal	8½	5	45
Soulanges	14	5	84
Cornwall	11	6	48
Farran's Point	1	1	3½
Rapide Plat	3⅞	2	11½
Galops	7¼	3	15½
Welland	26¾	26	326¾
Welland branches	⅝	2	10
Grand River Feeder	21	2	8
Port Maitland Branch	1⅞	1	7½
Sault Ste. Marie	1¼	1	18
	73⅝	49	

On the construction and enlargement of canals, and on the dredging and lighting of channels through shoaly stretches of the St. Lawrence and some of its smaller expansions or lakes, large sums of money have been spent. The amount expended by the Dominion of Canada, under the administration of the Department of Railways and Canals, on these works has been as follows:

Canals.	Total.
Lachine	$11,009,408 94
St. Lawrence River and Canals	2,527,670 33
Lake St. Louis	274,750 49
Lake St. Francis	56,961 46
Cornwall	6,794,929 98
Williamsburg, Farren's Point, Galops Rapid's Plat, Williamsburg	8,615,997 65
Welland	24,014,340 01
Sault Ste. Marie	4,093,025 60
Soulanges	6,254,692 43

The canals are all fine specimens of engineering. The Sault Ste. Marie canal has a lock nine hundred feet long, being the largest in the world. It is operated wholly by electric power.

The St. Lawrence canals are provided with locks 270 x 45 feet, and they have fourteen feet of water on the sills.

These great engineering works enable Canada to avail herself of an all water route from Port Arthur, at the head of Lake Superior, to Liverpool, of 4,494 miles.

We have to turn back nearly sixty years to note the wonderful changes which the Canadian canals have effected. All the great improvements of the Province date from their completion. Even the introduction of steam gave but a faint impetus to progress on the shores of the western lakes. Before its introduction, the country was almost out of the pale of civilization. A man leaving Toronto for Montreal, looked to a journey of a fortnight. He made his will and arranged his affairs, solemnly bade farewell to his family with far more feeling than a traveller in modern days would leave Quebec for Liverpool. The Durham boat in which he started was small, without accommodation, and with little to redeem its long trip; and as these small vessels approached the rapids, passengers held their breath as men do when they encounter danger. To pull these vessels up against the stream was a painful toil. Some small locks yet exist by the Coteau Rapids near the half ruined fort, as a reminder of the means taken in the earlier history of the country to get past the most troublesome waters. Men are still living among us who have seen the painful poling of the batteaux to pass these spots, and how often it seemed as if the toil would never be rewarded with success. Even the introduction of steam could not break through the limit which the imperfect navigation of the St. Lawrence imposed. Thus on leaving Montreal, the stage drove the passengers to Lachine, where they took a steamboat to the Cascades, a distance of 24 miles. At the Cascades they took a second stage, in which they drove to the Coteau Landing, some 16 miles. From Coteau Landing, a second steamboat carried them 41 miles, to take a third stage at Cornwall, by which they travelled a distance of 12 miles, to Dickinson's Landing, and at Dickinson's Landing they embarked on another steamboat which carried them to the upper lakes. Such travelling was necessarily tedious and expensive; and until the completion of the canals, so it remained. Twenty years have elapsed since the passenger first could go on board, from the basin at Montreal, if he saw fit, and remain undisturbed till he landed at Hamilton. Accordingly, a generation has grown up since the improved route has been established, and hence it is thought proper to preserve a record of it here.

It was the opening of the canals which gave life and vigor to Western Canada, and they are as essential to the Western States as to ourselves. The natural route to New York and Boston is by them, and it is only by the St. Lawrence that the Western flag can ever seek the sea.

The first contract for the construction of a canal in Canada was made in 1700. The Seigneurs of Montreal, the Seminary of St. Sul-

piece had already deepened the branch of the "Little River" (St. Pierre), which fell into the St. Lawrence near the present Custom House, and had attempted to cut a canal from the western end of "Lac St. Pierre," a long, shallow pond lying in an almost direct line between the town and Lachine, but were prevented by the solid rock. This work was taken in hand by M. de Catalogne, a noted engineer of that day, and successfully completed, so that a sufficient water supply was obtained for milling purposes and a practicable water-way for the canoes bound for the Upper Ottawa and the Far West established. The construction of a practicable canal, with locks, etc., to provide for navigation round the Lachine Rapids, was perhaps, the earliest great work proposed after the conquest, and its necessity was advocated before the passage of the Constitutional Act in 1791. A bill to carry out the project was introduced by one of the members for Montreal, in the first parliament which held its session under that act, and which commenced in December of the following year. It did not pass, as the resources of the Province were not considered equal to the undertaking.

In 1802 Sir Alexander Mackenzie advocated the construction of canals to give continuous navigation between Montreal and Lake Ontario.

In 1815, the exigencies of the war in the transport of munitions led the Governor-General, Sir George Prevost, to recommend the execution of the project for building the Lachine Canal, and an act of the Legislature was passed appropriating £25,000 in aid of its construction, while at the same time, special legislation in its favor was resorted to. Peace came and no further effort was made.

In 1819, in answer to a petition from parties in Montreal, a Joint Stock Company was chartered to undertake the construction of this obviously necessary project an dthe stock to the extent of £150,000, to be raised by £50 shares, was authorized. This scheme failed: but in 1821 an act was passed by consent, that the subscribers should abandon their rights on receiving back their money, and that the work should be undertaken by the Province.

A contribution of £10,000 was made by the Imperial Government, on condition that all military stores should be toll free. The work was commenced July 17th, 1821, and was completed in 1825.

The original canal was 28 feet at the bottom, 48 feet at the water line, with five feet depth of water throughout. The locks, six in number, were 100 feet x 20 feet, and were substantially built of stone. At the time of its construction, it was more extended as to breadth, depth of water, length and breadth of locks, than any canal in Great Britain, excepting the Caledonia, the Forth and Clyde Canals.

But this canal was inadequate to the requirements of the trade as may be gathered from the following notice from the *Quebec Gazette* of November 3rd, 1831:

"Public notice is hereby given that the Undersigned, and others, will apply to the Legislature of this Province at its ensuing session for the Privilege to form a Joint Stock Company for the purpose of making a Canal, Locks and Basins, in such places as they may find necessary for a useful navigation from the Lake of the Two Mountains to the waters of Lachine, and from thence to the foot of the Current St. Mary, with a branch to the port of Montreal should they think fit, of dimensions not less than will admit the Passage of such Vessels as can pass through the Locks of the Rideau Canal, and to acquire lands for Basins and water privileges as may be wanted by the said Company for the Navigation and the use of the waters thereof.

Horatio Gates,	Joseph Masson,
Dr. Arnoldi,	Jules Quesnel,
Thomas Phillips,	J. Bouthillier,
Andrew White,	Frs. Ant. La Rocque,
Peter McGill,	Jos. Logan.

Montreal, 1 October, 1831."

The enlargement was not, however, undertaken until 1843, the work being one result of the policy of the Imperial Government, in uniting the two Canadas, in 1840. It was evident, that the first step towards carrying out that intention, would be to remedy the deficiencies of the St. Lawrence, and make it a highway for travel and transport.

The Welland Canal was begun in 1824 and completed in 1833, the Rideau in 1832, the Cornwall Canal in 1842, the Beauharnois in 1845, the Williamsburg Canals in 1847, the Chambly Canal in 1843 and the enlarged Lachine Canal in 1848.

The report of the Commissioner of Public Works for the year ending June 30th, 1867, being the last report of the old Province of Canada, contains a general account of the most important public works of Upper and Lower Canada, previous to the constitutional change which was about to take place.

At page 566 of this report, is an account of certain of the canals, in these words:

"Prior to the construction of the Beauharnois Canal, the navigation between Lakes St. Louis and St. Francis was effected by means of short canal locks at the Cascades, Cedars and Coteau du Lac. Prior to 1804, they were as follows, viz.:

	Length of Canal.	Width of Lock.
"At the Cascades—Old French canal and lock at the Faucille, about.....	400 feet	6 feet
"At the Cascades—Trou du Moulin.....	200 "	6 "
"At the Cascades—Old lock at Split Rock	200 "	6 "
"At Coteau du Lac—Canal and two locks	900 "	7 "

"These canals had a depth of two and a half feet on the mitre sills of the locks, which were of stone and were designed for the passage of boats capable of carrying from 30 to 40 barrels of flour.

"In 1804, the locks at "Split Rock" and "Coteau du Lac" were partly rebuilt, and a new cana! about half a mile in length, with three locks, six feet in width between the quoin posts of the gates, was constructed at the foot of the Cascades, instead of the old French locks at the 'Faucille' and the 'Trou du Moulin.'"

In his interesting report on Canadian Archives for 1886, Mr. Douglas Brymner, Dominion Archivist, explained fully that a mistake had been made in describing these as French locks. Mr. Brymner wrote:

"The error committed in calling these French locks arose from the Department of Public Works having been obliged to rely for information on local tradition, no reference being possible at the time to documentary evidence.

"That these canals were not built during the French occupation, may be inferred with certainty from the negative evidence of Bougainville, who served with distinction under Montcalm (Memoire sur l'Etat de la Nouvelle France, 1757). In this Memoire, Bougainville describes (p. 79) the passage of Montcalm, from Montreal upwards, speaks of the frightful rapids; gives in detail the names of the places passed, describes briefly but forcibly, the Cascades, the Buisson, with its strong current, the difficult navigation over the whole course, and the portaging at various points, but makes no mention anywhere of a canal, except in speaking of Lachine, to which place, he says, a canal from Montreal had long been spoken of, but none built. It is clear, that situated as the French were after 1757, no canal could have been built in the interval before the conquest in 1759 and 1760.

"The positive evidence is, on the other hand, very complete. Colonel Gother Mann, of the Royal Engineers, in his report of the state of the canals, dated December 24th, 1800, says that they were first built between 1779 and 1783, and recommends their enlargement (C. 38, pp. 1 to 8). The exact date of construction can be settled positively from the letters of Capt. Twiss, the commanding officer of the Royal Engineers, under whose direction the works were in accordance with the orders of Haldimand, then Governor, who designed these canals primarily for facilitating the transport of military stores and munitions, but with the secondary objecs of assisting the merchants. These letters are in the series B, of the Canadian Archives."

In February, 1781, Twiss, acting on instructions from Governor Haldimand, called a meeting of the merchants whose goods passed Coteau du Lac and they "voluntarily and with great cheerfulness consented to pay ten shillings currency for each batteaux which passes the new locks."

The amount of toll during the season of 1781, was, according to a letter from Twiss, of the 3rd of December:

263 batteaux	at 10 s.	£131	10	0
2 canoes and 1 boat	" 5s.	0	15	0
		£132	5	0

Much of the interest in the history of these canals lies in the fact that they were the germ of the canal system now in existence. The size at different dates may be compared. The dimensions of the first canals (1779-83) it is not easy to determine. The proposals made by Colonel Mann for the canal to avoid the Cascades, etc., (1801-1805) may be taken as the measure of the others. That at the Coteau du Lac, he proposed to enlarge by making the opening of the gates nine feet six inches, to give an additional breadth of two feet to the canal and four feet to the locks and deepen the whole one foot six inches.

The first canal there (others appear to have been smaller) must, therefore, in all probability have had the following dimensions. Width of lock 16 feet; width of channel, eight feet; depth, one foot, six inches. There is no information as to the length of the lock.

Tabulating the figures according to dates, and taking throughout the gauge of the Lachine Canal for the more modern construction (leaving aside the other St. Lawrence and the Welland Canals, to simplify the comparison), the following progress is shown to this date:

	Width of Lock.	Width of Channel.	Depth.	Length of Lock.
1779-83	16 feet	8 feet	1.6 feet	... feet
1801-05	20 "	10 "	3.0 "	120 "
1821-25	20 "	48 "	5.0 "	100 "
1843-48	45 "	1,205 "	9.0 "	200 "
1874-83	45 "	150 "	14.0 "	270 "

The sills on the Lachine Canal are now adapted to 14 feet, except on the two lower locks, where the depth on the sills is 18 feet.

While the government, and particularly the military authorities, were building locks to facilitate navigation at the series of rapids between Lakes St. Francis and St. Louis, efforts were made to improve the navigation of the less boisterous stretches of rapids between Lakes St. Francis and Ontario. As was the case with all public works in those days, these seem to have been under military management. In one of the Militia volumes in the Dominion Archives is a memorial to the Duke of Richmond by Captain Angus Kennedy of the Second Regiment of Glengarry Militia, which contains the following: "That

your memorialist by the orders of Lt.-Col. George McDonald, inspecting Field Officer of Militia, was ordered on duty on the 22nd day of August, 1814, to superintend the improving of the navigation of the Long Sault Rapids on the River St. Lawrence in the Eastern District of the Province of Upper Canada, and that he continued on such duty till the 12th of December following."

At the session of the Legislature of Lower Canada in 1831 the sum of £10,201 sterling was voted for improving the navigation of the St. Lawrence between the Cascades and Lake St. Francis.

At the same session £4,000 sterling was voted, in addition to certain other unexpended appropriations, for the same purpose, for the improvement of the navigation of the River Richelieu. The more modern Canadian canals include some of the greatest engineering triumphs of the age.

The most recent expansions of the St. Lawrence River system are the Sault Ste. Marie and Soulanges Canals. The first-named connects Lakes Superior and Huron, and is necessary because of the difference of 18 feet between the levels of the lakes. At this place the first canal built was in the year 1797 by the North-West Fur Company, to enable them to carry their furs from and supplies to the Indian country of the North-West. The first canal was 40 feet wide, and had a total lift of nine feet, and the boats were towed from the end of the lock, up a sluice way, by oxen, the remainder of the distance to Lake Superior. This canal had the first lock ever built on the North American continent. The site upon which this primitive lock was built is preserved and used as a fish pond, and the oaken floor is as good, apparently, as it was when laid, over a hundred years ago.

Locks of various sizes have been built on either side of the river at Sault Ste. Marie from time to time, and now there are three locks in operation, two on the United States side and one on the Canadian. The larger one on the United States is 800 feet long and 100 feet wide. The Canadian lock is 900 feet long and 60 feet wide, and is said to be the longest lock in the world. Both the Canadian and the United States locks can pass vessels drawing 20 feet of water.

The business accommodated by these canals is very considerable. Indeed, few persons have any idea of the extent of the business served by the canals at the Sault Ste. Marie. The Suez Canal is the highway for Europe and Asia. Through it pass ships flying the British, the German, the Dutch, the French, the Austro-Hungarian, the Russian, the Italian, the Norwegian, the Spanish, the United States, the Portuguese, the Japanese and other flags. In 1902 the Suez Canal was used by 3,708 vessels, having a tonnage of 11,248,413 tons net.

Through the canals of the Sault Ste. Marie in the same year (1902) there passed 22,659 vessels, having a registered tonnage of 31,955,580 registered tons.

The Canadian Sault Canal is operated by electricity, and in consequence, the average time of making a lockage, including all delays to vessels in this dock, is fourteen minutes and fourteen seconds. The total cost of building the Canadian canal at Sault Ste. Marie was $4,216,529. Since it was opened the Canadian "Soo" has carried of wheat, grain and flour, during the first seven years an average of 19,140,000 bushels a year. During the two years 1902 and 1903 it carried an average yearly of 42,217,500 bushels of flour, grain and wheat.

The Beauharnois Canal is on the southern side of the River St. Lawrence. In 1891 in accordance with the general policy to render the canals system as strategically safe as possible, the Dominion Government resolved to build a canal on the north side of the St. Lawrence, the increasing demand for more accommodation being an additional incentive.

The Soulanges Canal, the result of this decision, opened in the autumn of 1899, is 14 miles long. The rise of 82½ feet between Lake St. Louis and Lake St. Francis is overcome by four locks. Three of these, each of 23½ feet lift, occur in the first mile from the Ottawa River. Then there is a reach of some two and a half miles to the fourth lock, which has a lift of 12 or 13 feet to the low water level of Lake St. Francis. The canal is, for purposes of navigation, a straight line throughout. Electricity is used as the motive power. The amount of earth and rock removed to make this canal was about eight million cubic yards. The other canals of this system have been brought into unison with the general scheme.

By the canal system of Canada, as originally sketched, it was proposed: 1st, to form an interior route of transport from Montreal to Lake Ontario adapted for the conveyance of troops and munitions of war; 2nd, to overcome obstacles in the St. Lawrence and thus give continuous safe water communication between the grain-growing regions of the great Laurentian Lakes and Montreal; 3rd, to make Montreal a port for ocean steamships of the largest size; and 4th, to bring Montreal and New York into communication with each other by means of water transport.

In the year 1826, the Rideau Canal, designed to provide the interior route of transport via the Ottawa, was commenced, that is, as far as surveying, levelling and building stone houses might be considered a commencement, but no active operations were engaged in till May, 1827, and in May, 1832, a steamboat passed through the whole extent, a distance from Lake Ontario to the Ottawa, of about 130 miles. The canal has 47 locks, some of which have a rise of not less than 15

feet. The highest point is the Rideau Lake, which is 292 feet above the level of the Ottawa at the outlet of the canal

The Richelieu and Lake Champlain system commences at Sorel at the confluence of the Rivers St. Lawrence and Richelieu, 46 miles below Montreal, and extends along the latter river to the basin of Chambly; thence by the Chambly Canal to St. Johns; thence to Lake Champlain, at the southern end of which connection is made by the Champlain Canal with the Hudson River, by which the city of New York on the Atlantic seaboard is reached. The Chambly Canal is 12 miles long.

The sum of $4,173,921 was expended on the Canadian canals by the Imperial Government, the Rideau Canal alone costing $3,860,000. This canal was transferred by the Imperial Government to the Canadian authorities, January, 1857.

Canada and the United States are old rivals in the matter of the development of their respective waterways. Canada's success has spurred the United States on to face an estimated expenditure of $101,000,000 on the improvement of the Erie Canal, and the work will soon be commenced. Canada for her part is counting the cost of building a new canal which will for all time secure to her the carrying trade of the West. The cost may reach $100,000,000. The Canadian Parliament last year voted a quarter of a million dollars for the purpose of collecting data upon this subject.

The new waterway referred to is that commonly known as the "Georgian Bay Canal" or the "Ottawa River and Georgian Bay Canal." The Ottawa River joins the St. Lawrence a few miles above Montreal. From this point it may be followed upwards almost due west for about two-thirds of the way to Georgian Bay. The remaining third is down hill, via the Mattawa River, Lake Nipissing, and the French River, ending at Georgian Bay. The total distance between Montreal and Georgian Bay by this shortest possible water route is about 425 miles. From the Georgian Bay end vessels may continue still due west for a distance equal to a quarter of the width of the Atlantic, through inland seas to the other end of Lake Superior, or they may turn south an equal distance to the other end of Lake Michigan.

The approximate distance between Montreal and Sault Ste. Marie via the existing lakes and St. Lawrence River system is 950 miles; the approximate distance between the same points via the proposed Ottawa River and Georgian Bay system is 610 miles.

The Dominion Government has a force of 150 men thrown out over the route collecting data for a 22-foot waterway.

The administration of the Canadian Canals comes under the Department of Railways and Canals.

CHAPTER IV.

The St. Lawrence Ship Channel.

THE STORY OF A VAST UNDERTAKING RECENTLY PLACED IN CHARGE OF THE DEPARTMENT OF MARINE AND FISHERIES.

THE port of Montreal is the gateway of Canada.

During the season of 1904, 796 sea-going vessels of an aggregate tonnage of 1,853,853 arrived in the busy harbor. The value of merchandise exported was $57,947,045, and of that imported, $76,056,830. The customs dues collected aggregated $11,674,305. It may be stated roughly that 33⅓ per cent. of the total exports of Canada and about 20 per cent. of the total imports pass through the port of Montreal.

The harbor has no less than seven miles of wharfage accommodation, and this is being rapidly added to.

In 1850 the number of vessels arrived at Montreal from sea was 210, of an average tonnage of 220. In 1880 the number increased to 710 vessels, and the average tonnage to 900 tons. In 1890 the vessels entered and left in one year numbered 776, and the average tonnage was 1,630 tons. In 1900 the vessels at the port entered and left were 850, with a total tonnage of 2,068,313, and an average of 2,550 tons. In 1903 the vessels entered and cleared numbered 862, with a total tonnage of 2,312,970, an average of 2,690 tons per vessel; the largest steamship entering having a net tonnage of 6,802 and a gross tonnage of 10,300.

Montreal thus leads the Atlantic ports of this continent in average size, the port of New York coming next, with an average sized ocean-going vessel in 1903 of 2,360 tons, and Philadelphia with an 1,800 ton vessel for its average size.

In actual sea-going tonnage entered, Montreal rivals Baltimore, and among United States ports is only exceeded by New York, Boston, Philadelphia and New Orleans.

The wonderful advance made by the port since 1850 is due altogether to the work on the St. Lawrence Ship Channel. Before 1851 the largest ship ascending the St. Lawrence to Montreal did not exceed 600 tons, and had a draught of not more than eleven feet.

From Quebec to Montreal a distance of 160 miles, the depth, excepting for some stretches, aggregating 30 miles mostly in Lake St. Peter, was never less than 30 feet, but the shoally stretches constituted

barriers beyond which vessels of even moderate size could not pass. It will be recalled that in 1535 Jacques Cartier's Primace, small though she was run, ran aground in Lake St. Peter, and the adventurous navigator and his men had to disembark into small boats to get past the shoal water and reach Hochelaga.

The history of the ship channel is interesting. It will be observed that from the first attempts to improve it in 1825, its national character has been recognized. In that year, the improvement of the ship channel between Montreal and Quebec was taken up as a matter of public importance by the Legislative Assembly of Lower Canada. The committee appointed to investigate the matter, having procured plans of Lake St. Peter and examined a number of witnesses, reported that the importance of the subject required that further information should be obtained. In the next year the subject was again discussed, and a committee appointed to make further investigations. The need of a thorough survey was felt, and in view of the fact that the Admiralty survey of the St. Lawrence was then in progress, and would soon reach Lake St. Peter, further inquiry was deferred, until a report of the Admiralty survey of the St. Lawrence could be obtained. In compliance with the request which had been made by Sir James Kempt, Captain Bayfield, having made this survey, submitted his observations on the nature of the lake, its channels, etc., in May, 1831. This report, accompanying a message from Lord Aylmer, Governor-in-Chief, was transmitted to the House in December, 1831, and referred to a committee of five members to report on same. No action immediately followed, however, and again in 1836 the matter was discussed and evidence taken before the Standing Committee of Trade. The Admiralty chart of the lake had not yet been received, and this seems to have delayed further action, for on May 5th, 1838, an ordinance was passed granting £500 for the purpose of making a survey of Lake St. Peter.

Nothing official is recorded of what followed this grant until 1841, when Secretary Daly, regarding the petition of the Montreal Board of Trade, wrote to the chairman of the Select Committee that "His Excellency has commanded me to inform you that the improvement of the navigation of Lake St. Peter will be considered with other public works." An extensive investigation was made by a special committee of the House, in August, 1841, into the "extent of the burden imposed on the trade by the obstructions to the navigation which it is sought to remove," and an estimate of the cost of deepening the channel in the lake to sixteen feet deep at low water, was made by David Thompson, C.E. The result of the investigation was the recommendation by the Special Committee of the House "that measures may be taken to deepen the ship channel in Lake St. Peter." During this investigation the committee discussed the proposal of a tonnage duty on the shipping passing up to Montreal, but while they believed that a tonnage duty, sufficient to provide for the cost of deepening the channel, would be much less burdensome to the trade than the cost for lighterage then was, yet they deemed that "in order to draw the produce of the west down the St. Lawrence it is expedient to make the transit charges as light as possible," thus clearly recognizing the national character of the St. Lawrence Ship Channel. Action was taken on the recommendation of the report, and an appropriation was inserted among the estimates for the prosecution of the work, which was styled in the report of the Board of Works, for 1841, "a subject of very great importance."

The expediency of the work being now decided, a question arose as to the best location for the channel in Lake St. Peter. Chas. Atherton, C.E., reported in favor of deepening the natural channel then used in the lake, but his advice was not followed, and work was begun in the straight or "Board of Works" channel, in the spring of 1844. But many of those who were the strongest advocates of the proposed improvements, objected to this location, maintaining that the desired object could be attained sooner, more effectually, and at a less cost, by deepening the natural channel. This opposition to the straight channel increased during the progress of the work, and caused its temporary suspension in the summer of 1846, and its final suspension in the fall of 1847.

Discussions and investigations continued until 1850, when the Harbor Commissioners of Montreal proposed a plan for the accomplishment of the work, believing that they could execute it successfully, by methods more economical and expeditious than had been adopted by the Board of Works. They proposed "That the Harbor Commissioners of Montreal should be authorized to undertake the work, and to borrow money, the interest of which should not exceed eight per cent., and this interest, as well as a sinking fund of two per cent., was to be provided for by a tonnage duty, not exceeding one shilling per ton register, on all vessels drawing ten feet and upwards, for each time they passed through the lake, and should the revenue so collected prove insufficient to pay the interest on moneys borrowed, the surplus revenues of the Harbor of Montreal were to be applied to make up any deficiency."

This plan was adopted by Government, and an Act of Parliament procured in accordance with it, (viz. Act 13 and 14 Vic., cap. 87 passed August, 1850), authorizing the Commissioners to borrow £30,000 for the purpose of proceeding with the works "in such a manner, direction, and place as the Commissioners should deem best." The Hon. John Young, member for Montreal, was then Minister of Public Works.

REPRESENTATIVES OF CANADIAN AUTHORITIES IN ARCTIC WATERS—THE "NEPTUNE" IN HARBOR

Thus far the work had been carried on with dredging plant belonging to Government, under the direct supervision of Government officers, and the plant was now transferred to the Harbor Commissioners for continuing the work.

The Commissioners forthwith appointed a Board of Engineers, to inquire into and report on the best means of obtaining a channel of sixteen feet depth through Lake St. Peter. After inquiring into the state and nature of the two channels, these Engineers reported in favor of abandoning the straight channel and of applying the work of improvement to the old or natural channel. The Harbor Commissioners adopted their recommendation and began operations in the old or natural channel in June, 1851. Early and continued success accompanied their efforts, and a rapid increase of shipping attended the available improvements of the channel.

By November, 1851, the natural channel in the lake, of about ten feet six inches at low water was deepened two feet. In August, 1853, a vessel passed through the dredged channel from Montreal to the foot of Lake St. Peter, drawing fourteen feet, and eighteen feet of depth at low water was accomplished in 1857.

These results were re-assuring, and demonstrated the feasibility of obtaining a channel of the required depth up to entrance of the Lachine Canal, the natural junction of the ocean and inland shipping of the country. The Harbor Commissioners now represented to the Government the national character of the work, urging that the benefits derived from the improvements in the channel were not confined to Montreal, but extended to the whole of the country lying to the westward, and prayed that the revenue of the harbor of Montreal might be relieved of the burden injustly laid upon it. John Page, C.E., then Chief Engineer of Public Works, in his report on the ship channel, dated January 25th, 1869, referring to this matter, says: "These views having been repeatedly brought before the Government, after a full discussion of the question, it was decided in 1860 that the river improvements should henceforth be considered as public works."

Thus it is clear that in 1860 the deepening of the ship channel between Montreal and Quebec was recognized and acknowledged to be a public work, and so continued to be considered, inasmuch as in 1866, almost the entire debt of the 20-foot channel was assumed and paid by the Government. The further deepening was carried on by the Harbor Commissioners for several years under the authority of the Dominion Government, with funds provided by the sale of Government debentures, the interest on which was paid out of the harbor dues.

Work was continued on the lake and river to attain a depth of 20 feet with a width of 300 feet, which was accomplished in November, 1865, the ship "Ocean" leaving Sorel, drawing 19 feet eight inches, and passing through the dredged channel in Lake St. Peter to Three Rivers, when at the same time, there were only ten feet six inches on the flats, or in the old channel, being equal to 20 feet two inches, with 11 feet on the flats.

But although the channel had been thus successfully tested, there remained some difficulty in navigating it in certain places. The "Ocean" grounded on a shoal, situated between two pools, at a difficult bend near lightship No. 1 in Lake St. Peter. This shoal was dredged off in 1866, and the channel thereby improved at that place, by increasing the width from 300 to 800 feet. At Pointe-aux-Trembles (en haut) the channel was found to be unsatisfactory, and in 1869 a new location was adopted and improved to 20 feet deep. The operations of 1866-9 were of limited extent, and consisted chiefly in clearing up and improving the 20 foot channel which was obtained in 1865.

No sooner was the 20 foot channel fairly in use than the rapid increase of ocean traffic, which was yearly calling forth not only a greater number of vessels, but much larger ones, required a further deepening of the channel, in order to retain, and if possible, increase, the share of the St. Lawrence in the carrying trade of the broad West. Agitation to deepen the channel to 24 feet was vigorously commenced, and through the exertions of the late Hon. John Young, and able co-adjutors, the agitation took definite shape in a resolution of the Harbor Board, passed September 30th, 1871, instructing the Engineer of the Board to make forthwith such an examination of the ship channel from Montreal to Quebec as would enable him to furnish the Board with an approximate estimate of the cost of deepening the same to a uniform depth of 24 feet, and widening it to a uniform width of 400 feet; said estimate to show also the cost of deepening the channel as above, but leaving the channel at its then present width of 300 feet.

The report made in accordance with this resolution was satisfactory, showing the proposed further deepening to be quite feasible at a reasonable cost. It was then decided to continue the work, and the necessary representations were made to the Government. On May 23rd, 1873, an act was assented to, granting a loan of $1,500,000 and permission for "completing the ship channel in Lake St. Peter and the River St. Lawrence to the depth of not less than 22 feet at low water and a width of not less than 300 feet." On July 10th, 1873, an order-in-council was passed, giving permission to the Commissioners to purchase the plant necessary for carrying on the work. Contracts were forthwith let for the building of the necessary vessels, but these were not received in time for use in 1874, and during the first season only one dredge and one stone-lifter were at work.

At the close of 1877 the dredging had so far advanced that it became possible, with another year's work, to attain a depth of 22½ feet

at low water at all points above the reach of tidal assistance, and thus above to give navigation the benefits of the first step of two and a half feet in the contemplated increase to 25 feet. The work of the past year was, therefore, arranged with this object in view, and it was attained, and proof of the fact was made by the Commissioners accompanied by their officers and a number of pilots, making a trip through the channel, on November 18th and 19th.

The cost of dredging in Lake St. Peter was reduced in 1881, to 3 3-10 cents per cubic yard.

The depth of 22½ feet being thus accomplished, work was continued to attain the depth of 25 feet at low water resolved on. This was accomplished in the autumn of 1882, when a thorough test of the channel was made on October 3rd.

The object kept in view in carrying on the summer's work of the year 1882 was to redeem the promise of some years previous that the 25 foot channel should this year be open for navigation, and special efforts were made that this also should be done as early in the summer as possible, so that its benefits to navigation might be felt during the low water of autumn. For this purpose, two of the largest dredges and a stone-lifter, with the tugs attending them, were worked night and day, and the Montreal harbor-dredging fleet was also, as far as practicable, made to assist the ordinary ship channel plant.

The breadth of the dredged channel at that date was 325 feet in the straight parts in Lake St. Peter between the White Buoy and No. 1 Light Vessel: 300 feet minimum width in the straight parts elsewhere, with increased width at bends and other places where navigation required.

As the work of deepening the channel to 25 feet approached completion, the growth of the St. Lawrence trade was seen to require still further improvement of the channel, and the Harbor Commissioners of Montreal obtained permission, by an order-in-council passed June 14th, 1883, to proceed with a further deepening to 27½ feet at low water.

During 1887 the Harbor Commissioners found that the loan of $1,500,000, would not complete the channel to 25 feet, and therefore applied to the Government for an additional advance of $280,000, which was granted them; the Commissioners paying as usual the interest for the same.

This sum enabled the works to be carried on, and on October 3rd the channel was formally opened, 25 feet having been attained all along the river, except at Cap Charles and Cap a la Roche, where it was necessary to pass at high tide, as, at lowest water, there was only 22 feet. It was decided, however, that this should be deepened two feet to make it regularly available at half-tide, so as to prevent delay in waiting for high water.

The total quantity of material dredged up to the time of the completion of the 25 foot channel was 15,230,000 cubic yards.

The 27½ foot channel was formally opened November 7th, 1888. After considerable experience in navigating the channel, it was found that at a number of places it was hard to steer the ships in safety, in consequence of sharp turns and cross currents. The Commissioners, therefore, instructed their engineer to prepare an estimate of what would be required at the dangerous places, and he estimated that to straighten, widen and make the necessary improvements would cost $195,294; say $200,000.

This year (1888) was an eventful one in the history of the ship channel. During that year's session of parliament an Act was passed which assumed the Lake St. Peter debt, and relieved the Montreal Harbor Board of the interest on the expenditure made on the deepened channel, which had hitherto been a charge on the trade of the port. This enabled the Harbor Board to give a free ship, that is to say, no tonnage dues have been since levied, so that the Harbor of Montreal, in so far as the ship is concerned, is free to vessels from all parts of the world, as well as to inland navigation.

In accordance with the Act of Parliament (51 Vic. Cap. 5), the deepening of the ship channel became one of the public works of the Dominion, and was virtually so treated after May 22nd, 1888. The immediate management of the work, however, remained in the hands of the Harbor Commissioners till December 31st, when the staff, working plant, ship-yard and shops, were entirely handed over to the Government. The official connection of the Harbor Commissioners with the ship channel works then ceased, after having continued over 38 years, during which time the Commissioners had carried out all the successive deepenings of the work to that time.

The following statistics of the work of improving the ship channel up to 1888 are interesting:

1844	Government commences the work (straight channel).	
1846	Government suspends the work (straight channel).	
1847	Government abandons the work (straight channel).	
1850	Harbor Commissioners take up the work. Depth of channel 11 feet. They adopt the natural channel.	
1851	Depth of Channel	13 feet.
1852	" "	15 feet 2 inches.
1855	" "	16 feet 6 inches.
1857	" "	18 feet.
1865	" "	20 feet.
1878	" "	22 feet 6 inches.
1882	" "	25 feet.
1888	" "	27 feet 6 inches.

Works taken over by the Dominion Government.

Cost up to 20 feet (1865)	$1,164,366
Cost from 20 to 25 feet (1882)	1,780,000
Cost from 25 to 27½ feet (1888) (approx.)	556,734

The total quantity of material dredged in deepening the channel from 20 to 27½ feet under the Harbor Commissioners was 15,485,682 cubic yards, and length of channel in which the dredges had worked 4,486 miles. To deepen the channel from 20 to 22 feet, 4,094,329 cubic yards were dredged, from 22 to 27 feet, 4,150,464; from 25 to 27½ feet, 6,975,889.

The first work done after the Government assumed control was to improve the Cap a la Roche channel.

At the close of the season's work, 1889, the condition of the ship channel was as follows: From Montreal to the head of Cap a la Roche channel, there was not less than 27½ feet throughout at low water with 10½ feet on the flats of Lake St. Peter and at low water of tides, except at the Champlain Point bar where a slight silting up had taken place. Through the Cap a la Roche, Pouillier Rayer and Cap Charles channels there was a depth, varying with the tides, between about 30 feet when the river was swollen in spring, and between 24 feet and 30 feet when it was at lowest in the fall.

Active work has been pursued ever since at improving the channel at Cap a la Roche and other places, including the widening at bends, and in some cases, the straightening of the channel. At present, moreover, the channel is being deepened to 30 feet, and it is expected that this depth will be attained next year.

With the object of organizing the different branches of the Dominion public service, relating to navigation, under the immediate control of the department directly responsible for the buoys, lighthouses, pilotage and all questions of navigation; the entire management and control of the River St. Lawrence Ship Channel, together with the dredging and sweeper plant, steamers, and other appliances hitherto used by the Department of Public Works in connection therewith, were, under the provisions of an Order-in-Council, passed over in July 1st, 1904, to the control of the Department of Marine and Fisheries.

The Government Ship Yard at Sorel, where the dredging plant is constructed and repaired, together with the shops, stores, etc., were also transferred in connection with the same service.

In this connection Mr. F. W. Cowie, C.E., formerly Engineer in Charge of the Ship Channel, was transferred by Order-in-Council and appointed Superintending Engineer of that important work, the transfer including the engineering and clerical staff.

As a great engineering work the St. Lawrence Ship Channel has special interest. When first undertaken it was considered, of its kind, a work of unusual magnitude, and it is still quoted as one of the great dredging works of the world. Though not the birthplace of the St. Lawrence Ship Channel takes a first place among the works, where great improvements have been applied to dredges and methods of dredging, which have resulted in their present efficiency and development. In 1846 the Board of Works reported the performance of a dredge "most satisfactory," when raising 1,160 cubic yards per day in Lake St. Peter, from a depth of ten feet, but continued improvements up to even 1888 brought the dredges to a daily capacity of 3,000 or 4,000 yards in Lake St. Peter clay, and 600 or 700 yards in unblasted shale rock at 25 or 30 feet depth. The dredges used up to that date were almost exclusively of the kind known as ladder dredges, with an endless chain of buckets, and it was the only instance on the continent where such dredges had been systematically used on a work of any magnitude. It is claimed that here radius dredging was originated, without which it would be almost impracticable to dredge with precision over large areas in wide rivers and lakes. It is also of special interest to note, that unlike most river works, the St. Lawrence Ship Channel costs practically nothing for maintenance. From the great lakes the pure water passes through the rocky channels of the Thousand Islands and the several rapids that lead to Montreal. Thence the river flows with a gentle current, bearing but very little detritus, and the artificial deepening when once made, remains permanent, without either silting up or scouring out of shape to any great extent.

Since the Dominion Government assumed control of the work, dredges of the suction type of exceptionally large capacity have been added to the dredging fleet employed on the channel.

In view of the intimate connection of the Harbor Commissioners of Montreal with this great national work some particulars regarding that body appear to be called for.

Before the old stone revetment wall along the harbor, removed a few years ago, was built, the Montreal river front presented a ragged appearance. The bank was steep and the shipping anchored off the bank in fourteen feet of water. Vessels anchored close in and goods were run out on planks to the shore. In 1830 there passed through the Legislature of Lower Canada a statute entitled "An Act for the Improvement of the Harbour of Montreal." Under this statute three harbor commissioners for the port of Montreal were appointed for six years. The first Board consisted of the Honorable George Moffatt, chairman; Jules Quesnel, and Captain Robert S. Piper of the Royal Engineers. The old revetment wall was built after the plans of Captain Piper and the work was commenced in 1832. The commission

REPRESENTATIVES OF CANADIAN AUTHORITY IN ARCTIC WATERS—CREW OF THE STEAMER "NEPTUNE" (1903-1904)

was apparently appointed for that special work alone; but was continued by acts passed from time to time as the scope of its work widened. The commissioners were appointed during pleasure by the Crown, and, up to 1855, there were only three. Up to 1850 the Board confined its activity to the harbor; but in that year, as previously stated, it assumed the work of deepening Lake St. Peter. In 1855 the president of the Board of Trade and the mayor of the city were ex-officio added to the Commission. In 1873 the number was increased to nine, of whom five were nominated by the Crown, one appointed by the Board of Trade, one by the Corn Exchange, one by the merchant shippers, and one was the mayor of the city. With unimportant changes and additions the constitution of the Board has so continued down to the present time.

In the meantime the river, with its lights, buoys, pilots, etc., was under the care of the Trinity Board of Quebec. By an ordinance of the Special Council (1839-40) 2 Vic. cap. 19, the Trinity Board of Montreal was constituted. The port of Montreal was declared to extend from Portneuf on the east to the Province line of Upper Canada on the west. Throughout all this stretch of river the new corporation had charge of all buoys, beacons, lighthouses, light-ships, pilots, in short complete control of navigation. In 1849, (12 Vic. cap. 117) a new and amended act to the same purport was substituted. This lasted until 1873, when, by 36 Vic. cap. 61, the Trinity House of Montreal was dissolved and its duties were assigned to the Harbor Commissioners. The Harbor Board has, by its original constitution, an actual ownership in trust for the public. To meet the expenses of this trust and the interest of its debt (about $2,000,000) the Board collects dues on goods imported and exported, but all dues on shipping have been abolished.

The entire harbor and the basin up to ordinary high water mark are public property, and are under the control of the Dominion Government through the Department of Marine and Fisheries.

The Commissioners have the management of the affairs of the port generally, including the making and enforcing of by-laws, the fixing of harbor dues, the apportionment of wharf space, the construction and maintenance of the wharves and other works, the collection of dues and disbursement of expenses, the appointment of officers, etc. The by-laws and changes in rates, harbor dues, are, however, subject to the approval of the Governor-General-in-Council before coming into effect. Any new wharves or any interference with the river bed is also subject to the approval of the Governor-General-in-Council, as is the case at all places in the navigable waters of the Dominion.

Monies for capital expenditure beyond what can be provided for out of ordinary revenue are raised by the issue of bonds by the Commissioners, under special acts of Parliament, and the interest for such bonds is paid out of the harbor dues.

Besides having jurisdiction over the Montreal harbor proper, the Commissioners were also up to a recent date charged with the licensing and supervision of pilots between Montreal and Quebec, and with certain other matters pertaining to the navigation of that part of the River St. Lawrence, since transferred to the Department of Marine and Fisheries.

There are no wharves under private ownership. Berths and wharf spaces are, however, allotted to companies or persons from time to time but not for longer than a year, except in rare cases and under special agreements. In practice, however, the same berths and spaces are re-allotted to the same parties year after year, as long as requested and the public interest permits, but the Commissioners reserve and exercise the right to send any vessel to any unoccupied berth, even although it one allotted to the agents of other vessels.

No charge is made for wharf space beyond the wharfage rates on such goods, but for space specially allotted for use as a place of storage of business, a charge is made. Vessels are at no charge for berths, and the only charge which they pay is hospital dues, which are insignificant.

The year 1898 was an eventual one in the history of the Harbor Commission, as marking the conclusion of an agreement between the Commission, the City Corporation and the Dominion Government, by which the extensive improvements to the harbor facilities and the additions to the wharfage accommodation, so long desired and so earnestly urged by the Board, have been to a great extent carried into effect.

The Commission continued to press upon the Government the special claims of Montreal as the national port of the Dominion, and the fact that its situation at the head of ocean navigation obliged the port authorities to receive and accommodate not only the large ocean steamers then coming to the port, but provide for the continual increase in size and capacity of those they would be obliged to accommodate in the future, while providing at the same time for the requirements of inland vessels bringing to this port for transhipment across the Atlantic the product of the West, for whose inland transport such large sums have already been expended by the Dominion.

While the Dominion Government did not consent to all the propositions submitted to them by the Commission, they so far met the views of the Board as to place before Parliament an Act by which power was given to proceed with many of the proposed improvements to the harbor. This Act, passed by the Dominion Parliament on June 13th, 1898, empowered the Government to lend to the Harbor Commissioners $2,000,000, of which $1,250,000 was to supplement that formerly authorized for the carrying out of the long required harbor

improvements opposite the central part of the city, and the remaining $750,000 was to be applied toward the building or improvement of wharves, structures and other accommodations, including the building of a dry dock below St. Mary's Current, the plans in each case to be subject to the approval of the Dominion Government before construction began.

Under this Act a complete re-construction and a re-equipment of the harbor have taken place.

A subsequent statute (Act 1 Edward VII., Chapter 9) provided for another Government loan of $1,000,000 to the Commissioners for the erection of a grain elevator and other improvements.

The bonded debt of the Board in 1904 was $6,122,000, of which $2,222,000 was due to the public and $3,900,000 to the Government, upon which the average rate of interest was 3.72 per cent. per annum. This is paid out of the regular revenue of the Board, and it is important to add that towards the heavy capital expenditure of improving the harbor of Montreal the Federal and local Governments have never contributed one cent, except in loans, upon which the interest has always been regularly paid.

CHAPTER V.

The Department of Marine and Fisheries.

SOMETHING ABOUT ITS ORIGIN, ITS WORK, AND ITS PRESENT GREATLY EXTENDED SCOPE.

DURING the historical debates at Quebec with preceded Confederation, attention was drawn to the, even then, vast maritime interests of the provinces, and the importance of consolidating them into a united national interest, and then providing for its future development emphasized. The Honorable George Brown in his speech on February 8th, 1865, read some figures illustrative of the importance of the Canadian shipping interests of that date and of the future maritime greatness of the proposed Confederation. Among others, he read the following tables :

On December 31st—

	Vessels.	Tons.
1864, Canada owned	2,311	287,187
1863, Nova Scotia	3,539	309,554
1863, New Brunswick	891	211,680
1863, Prince Edward Island	360	34,222
1863, Newfoundland	1,429	98,603
Total	8,530	932,246

By the census of 1861, it appears that the numbers of sailors and fishermen were then:

In Canada	5,958
In Nova Scotia	19,637
In New Brunswick	2,765
In Prince Edward Island	2,318
In Newfoundland	38,256
Total	69,256

The joint products of our sea-coasts and inland lakes were, in the years named, estimated at the following values:

Upper Canada, 1859	$380,000
Lower Canada, 1862	703,895
Nova Scotia, 1861	2,072,081
New Brunswick, 1861	518,530
Newfoundland, 1861	6,347,730
Total	$10,022,236

The exports of products of the sea in the year 1863 were as follows:

From Canada	$789,913
" Nova Scotia	2,390,661
" New Brunswick (1862)	303,477
" Prince Edward Island	121,000
" Newfoundland	4,090,970
Total	$7,686,021

In connection with this last table, Mr. Brown remarked:

"Add to this, $9,000,000 received in the same year for new ships, and we have $16,696,021 as one year's foreign exports of our ship-building and fishing interests."

In view of the importance attached to the maritime interests of the new Dominion by the men chiefly concerned in bringing the Confederation into existence, it was only natural that when the machinery for the administration of the country was provided, a separate department was created for the protection and development of those interests, with a member of the government at its head.

We find that the Department of Marine and Fisheries was called into existence on the date of Confederation, July 1st, 1867, for the purpose of administrating the marine interests of the new Dominion, as well as the important interests connected with the fisheries.

No such department had previously existed in any of the provinces which now form the Dominion.

The expenditure of the Department for the fiscal year ending June 30, 1868, was $371,070.56; 1879, $786,156.23; 1888, $883,250.25; 1898, $856,192.50; 1900, $982,561.97; 1901, $1,028,925.32; 1902, $1,501,618.88; 1903, $1,671,494 77; 1904, $2,150,940.31; 1905, $5,727,000. These figures indicate the growth of the Department and show how progressively and tremendously the policy of encouraging the Dominion's maritime interests has expanded during the past few years.

The first Minister of Marine and Fisheries was the Honorable Peter Mitchell, one of the Fathers of Confederation from New Brunswick.

The heads of the Department from its creation to the present time have been as follows :

Hon. Peter Mitchell, July 1st, 1867 to November 5th, 1873; Hon. Albert J. Smith, November 7th, 1873 to October 9th, 1878; Hon. J. C. Pope, October 19th, 1878 to July 10th, 1882; Hon. A. W. McLelan, July 10th, 1882 to December 10th, 1885; Hon. Geo. E. Foster, December 10th, 1885 to May 29th, 1888; Sir Chas. H. Tupper, May 31st, 1888 to December 21st, 1894; Hon. John Costigan, December 21st, 1894 to July 6th, 1896; Sir Louis H. Davies, July 13th, 1896 to September 25th, 1901; Hon. James Sutherland, January 15th, 1902 to November 11th, 1902; Hon. J. Raymond Prefontaine, November 11th, 1902 to the present.

When the Honorable Peter Mitchell assumed office he found himself called upon to fill a position which was the first of the kind which had ever existed in British North America. As legislation was necessary to organize the Department legally, an act was passed at the first session of Parliament, organizing it and defining the nature of its duties, and the various branches of the public service, which were in future to come under its control, regulation, management and supervision.

The subjects which were enumerated in the act organizing this Department and to be administrated by it, were the sea-coast and inland Fisheries, Trinity Houses, (1) Trinity Boards, Pilots, Pilotage, Decayed Pilots' Funds, Beacons, Buoys, Lights and Light-houses and their maintenance, Harbors, Ports, Piers, Wharves, Steamers and Vessels belonging to the Government of Canada, except gun-boats or other vessels of war, (1a) harbor commissioners, harbor masters, classification of vessels, examination and granting of certificates of masters and mates, and others in the merchant service, shipping masters and shipping offices, inspection of steamboats and board of steamboat inspection, enquiries into causes of shipwrecks, establishment, regulation and maintenance of marine and seamen's hospitals, and care of distressed seamen, and generally such matters as refer to the marine and navigation of Canada.

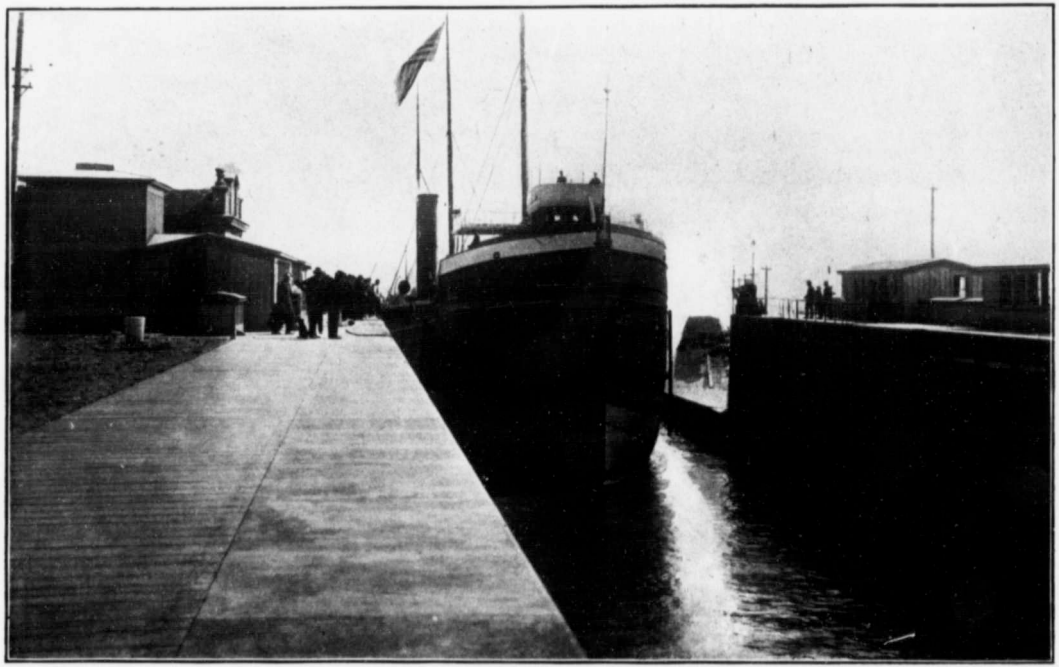
The act alluded to was only assented to on May 22nd, 1868, and consequently the Department had no legal existence until near the close of the financial year ending June 30th, 1868.

The management of the lighthouses in the Province of Ontario, and in Quebec above Montreal, was, previous to Confederation, vested in the Department of Public Works, of the old Province of United Canada, and during a portion of the year ending June 30th, 1868, until the staff of the new Department was appointed, that Department continued to manage this branch of the public service.

In the Province of Quebec, all matters relating to lights, buoys, beacons, pilots and pilotage were formerly managed by the Trinity

(1) The original Trinity House of England was founded at Deptford in Kent, by Sir Thomas Spert in 1512, as an "Association for the Pilotage of Ships" and was already a body of great importance, when, in 1514, Henry VIII. granted it a charter under the designation of the "Guild or Fraternity of the Most Glorious and Undividable Trinity of St. Clement," *inter alia* "for the relief, increase and augmentation of the Shipping of this Realm of England." The guild, under its original charter, consisted of the three orders. Master, Wardens and Assistants, numbering thirteen in all, and elected annually by the Brethren. Since the institution of this important body the duty of erecting and maintaining light-houses and other marks and signs of the sea, has by Royal Charter and Acts of Parliament been entrusted to this Corporation. Until 1854 all light dues were collected by Trinity House, and until 1874 Masters of the Navy were examined by the Elder Brethren. The present duties of the Elder Brethren have reference to Pilotage, Light-houses, Buoys and Beacons, etc., and attendance at the Admiralty Court to act as assessors, also to advise the Board of Trade in nautical matters. There are thirteen acting Elder Brethern, of whom two are elected from the Royal Navy and eleven from the Merchant Service; there are also eleven Honorary Elder Brethren. The income of the corporation derived from light dues levied on shipping entering and leaving British ports amounts to £300,000 per annum, which is expended in the maintenance of the Lighthouse and coast-marking system of England and Wales, under the financial control of the Board of Trade. The corporation also administers certain charitable trusts specifically dedicated to the relief of decayed master mariners and their widows, the accounts in respect of which are rendered to the Charity Commissioners.

(1a) Vessels of war were supposed to be attached to the Militia Department.



LAKE STEAMER ENTERING THE LOCKS OF THE CANADIAN SAULT STE. MARIE CANAL

Houses of Montreal and Quebec, which were independent chartered corporations, but they were not placed specially under any department, and were subject to very little executive interference. These corporations being at the time of Confederation placed under the Marine and Fisheries Department, all their business with the Government was done through it, and their expenditure examined and checked by its officers.

In New Brunswick the lights were managed by a board of commissioners of public institutions, and on the appointment of the first Minister of Marine and Fisheries he assumed the management of this service at once, and subsequently appointed an agent to transact the local business under his directions.

In Nova Scotia the lighthouses were formerly managed and superintended by the Board of Works, which continued its supervision over this service until December, 1867, when an agent was appointed to transact all the local business of the Marine and Fisheries Department in that Province.

These local agents were found necessary in New Brunswick and Nova Scotia on account of the great distance of those Provinces from the head office, and in order to prevent delay in transacting the business of the Department, which could not advantageously be done without a local office.

One of the first steps taken in connection with the organization of his department by the first Minister of Marine and Fisheries was to communicate with the Boards of Trade and Harbor Commissioners of Montreal and Quebec and submit to them a series of questions to obtain the views of the commercial community on various leading questions, such as the classification of vessels, light charges, shipping dues, registration, pilotage, quarantine, the consolidation of the functions of Trinity Houses and Harbor Boards, etc.

The replies to this series of questions elicitated some interesting information. For instance the following facts about the Trinity House at Quebec were learned.

The corporation of the Trinity House of Quebec was established in 1805 by the Provincial Act, 45 Geo. 3, ch. 12.

And was in charge of all the lights, buoys, and beacons, etc., from the Harbor of Montreal to the gulf until the year 1849, when the Trinity House of Montreal was incorporated. Since then, the Trinity House of Quebec had had only the supervision of the lights, etc., from the Richelieu downwards.

In 1849 the laws relating to the Trinity House of Quebec were consolidated into an Act, 12 Vic, ch. 114.

Among the duties of the Board were the following :

To make by-laws for the security of navigation within its jurisdiction, which extends from the basin of Portneuf, above Quebec, to the eastern limits of the Province, to hear and adjudicate on suits for infractions of harbor and port regulations; on suits against pilots for dereliction of duty; on differences between pilots and their apprentices; suits instituted under the Pilot Incorporation Act, suits instituted under the Harbor Commission Act, and on differences between parties in relation to salvage services; all applications for grants of beach, and deep water lots were referred to the Board, whose duty it was to report if such grant would prove any obstruction to the navigation or not. Apprentices of Pilots were examined before the Board, from whom they received their branches as pilots. The Trinity House was charged with the administration of the Pilot Fund, the investment of its moneys, collection of interest and poundage on pilotage, the fixing and paying of pensions to decayed pilots, their widows and children, the administration and regulation of lighthouses within the limits of its jurisdiction, and all buoys and beacons within its jurisdiction, and of the several provision depots for shipwrecked mariners.

The Trinity House had no revenue, but its expenses were paid out of the public chest. Its expenses for the year 1867 amounted to $48,-758.05, exclusive of the cost of supplying lighthouses, and attending buoys and beacons, this service being performed by the provincial steamers.

The Montreal Board of Trade, responding to the Minister's request for suggestions, strongly advocated the abolition of the Trinity House of Montreal, recalling the fact that as long previously as 1863 the Board had memorialized the Government of the old Province of United Canada to take that step. This memorial set forth the following :

"Your petitioners believe the public interest would be promoted, and a large annual saving of public money effected by abolishing the Trinity House at Montreal, and distributing the functions now performed by that body between the Department of Public Works and the Commissioners of the Harbor of Montreal, assigning to the former charge of the lighthouses on the river between Montreal and Quebec and to the latter the execution of the laws relating to pilots and pilotage, with all other powers and duties now appertaining to the Trinity House, by which means the improvement constantly going on in the channel, between Montreal and Quebec, would, in the opinion of your petitioners, be made more thoroughly available to the shipping interests of the Province."

The following extracts from the detailed reply of the Montreal Board of Trade to the Minister's circular are instructive :

"A uniform and general classification for all vessels trading within the Dominion might be advantageous; but, we fear, would be difficult to make really efficient without too great expense, and unless thorough, would be useless.

"We consider all charges for maintenance of aids to navigation should be borne by the general Government, so that these very important things may be at all times kept on an efficient footing; whereas, if paid by charges on shipping, the revenue would fluctuate so greatly as to cause grave inconvenience. But we deem it quite just that all shipping should pay such dues as would, on an average of many years, repay to Government a considerable part of such disbursements.

"The pilot service below Quebec is unsatisfactory and much complained of by ship-owners. Formerly pilots were paid according to their personal services, which were in proportion to their skill, industry and intelligence. This plan gave inducements to pilots to be on the look-out in fog or stormy weather. At present these pilots are all placed upon the same level, careless and attentive men share alike in the common earnings of all, to the notorious injury of the service. Pilotage should be compulsory, but the authorities should take measures for its efficiency."

During the first few years of the existence of the Department of Marine and Fisheries a wide range of subjects came up for regulation.

A serious difficulty had been for many years experienced by the masters and mates of vessels belonging to the British North American colonies when they were under the necessity of clearing at any of the ports of the United Kingdom for any country or colony except the one in which their vessels were registered, as the Imperial Merchant Shipping Act required that they must be provided with certificates of competency for their respective grades before the authorities would allow their vessels to be cleared at the custom house. In many instances, when a master could not pass the necessary British examination to enable him to procure his certificate of competency, he had either to abandon his vessel to the charge of some other master, who possessed such certificate, or to employ a certificated master temporarily to enable the ship to be cleared. There were no facilities or arrangements in existence in the Dominion, by which shipmasters could be examined and obtain the necessary certificates, and no provision had been made by the British authorities for recognizing any certificates of competency granted by the Government of a colony.

This subject was brought at the suggestion of the Minister, under the notice of the British Board of Trade by the Government of Canada during the year 1869, and an Act was subsequently passed by the Imperial Parliament, providing that when the legislature of any British possession provided for the examination of, and grant of certificates of competency, to persons intending to act as masters or mates on board British ships, and the Board of Trade reported to Her Majesty that they were satisfied that the examinations were so conducted as to be equally efficient as the examinations for the same purpose in the United Kingdom under the Act relating to merchant shipping, and that the certificates were granted under the said acts, it should be lawful by Her Majesty by Order-in-Council, to declare that the certificates granted in such British possession should be of the same force as if they had been granted in the United Kingdom, and should be recognized by the authorities there.

During the session of the Dominion Parliament of 1870, a bill was submitted by the Government to the Legislature of Canada providing for the examination of, and grant of certificates of competency and service to persons intending to act as masters and mates on board seagoing ships registered in Canada, in which provision was made for the appointment of examiners, and the laying down of rules as to the qualifications of the applicants.

The importance of obtaining official records of wrecks, with a view of investigating the causes thereof, was realized, and during the year 1869 the Marine and Fisheries Department took the necessary steps to furnish all the chief officers of customs in the Dominion as well as the lighthouse keepers under the control of the department, with printed forms for notices of wrecks and casualties, with a request that information would be procured relating to any wrecks which might occur in their neighborhood, and that the forms be filled up and forwarded to the department with the view of having a correct register of such wrecks made up and published once a year.

The Government of the Dominion having considered, at the suggestion of the Minister, the subject of granting honorary rewards to persons who had displayed gallant conduct in attempting to save the lives of persons at sea or on the coast of Canada, decided in 1870 that in such cases as they may consider advisable, they would follow the commendable practise adopted by all the maritime states of Europe, as well as the United States of America, of bestowing some reward or recognition of the services rendered under such circumstances.

The same year an act was passed transferring the management of all the lighthouses, lightships, buoys and beacons in the district of Quebec over to the Department, and on July 1st, 1873, the management of the lights of the Montreal Trinity House district was also placed under the Department.

During the first few years of the department's existence, an active lighthouse building policy was in vogue, the demands for additional aids to navigation being numerous and urgent. The construction was at first in the hands of the Department of Public Works, but as the works were so widely scattered, and often at remote points, the Public Works Department found it difficult to cope with the difficulties presented, and in 1870 the charge of constructing the lighthouses, etc., was added to the other duties of the Department of Marine and Fisheries.

In his annual report for 1872, his last before relinquishing office, the Hon. Mr. Mitchell, the first Minister of the Department, commented at length upon the remarkable increase in the work of the department. He explained that the construction of the new lighthouses of the Dominion had much increased the duties of himself and officers, as well as increased the correspondence of the department, as many of such works were situated at very inaccessible and remote places on the sea coast and lakes, and required a great amount of vigilant supervision during their construction. The Act, 33 Vic, cap. 18, merely gave authority to the Minister of Marine and Fisheries to construct such lighthouses and other public works connected with his department as the Governor-in-Council may direct, but since the passing of this Act, all the lighthouses, lightships, and steam fog whistles which had been erected or placed in Canada had been built under the superintendence of the department.

The administration of all questions in connection with the examination of masters and mates, and the granting of certificates of competency and service, has also added much to the duties of the department during the preceding eighteen months.

Another important branch of the department, the administration of which required much care, conciliation and firmness, it was pointed out, was the inspection of all the steamboats, with their boilers and machinery, belonging to the Dominion; and as they had been rapidly increasing until they then amounted in number to 473, it was of the greatest importance that the inspection should be carried out in the most thorough and impartial manner, and that it should command the confidence both of the steamboat owners and the travelling public. The examination of the engineers who managed the boilers and engines of these steamboats had already also assumed large proportions.

The duties of the corporation of Trinity House, Quebec, had been very much reduced since the department assumed the direct management and control of the lighthouses and lightships in the district, formerly under the management of the Trinity House. Their duties were at the date mentioned principally confined to all matters relating to pilotage of the Lower St. Lawrence, harbor master's duties, and some other minor matters relating to shipping.

Up to 1872 (Sessional Papers 1873), the Minister reviewed the work of the Department annually in a personally signed report addressed directly to His Excellency the Governor-General. Since then the main annual report has been made by the Deputy Minister, and addressed to His Excellency, by the Minister, in a mere formal covering note.

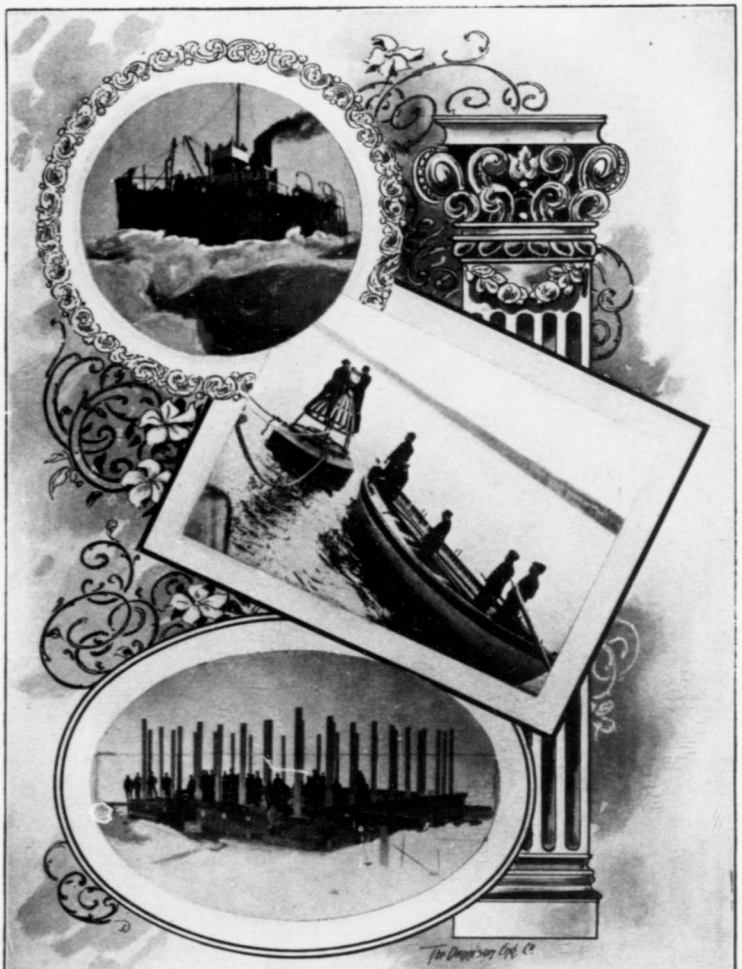
During the session of 1872 an act was passed abolishing the Trinity House of Montreal entirely, and vesting in the Harbor Commissioners of Montreal all the duties relating to pilotage formerly under the management of the Trinity House, and also providing that the buoys and beacons formerly maintained by the Trinity House, Montreal, should be placed and maintained by the Harbor Commissioners of Montreal, and the expenses of so doing paid out of the funds of such Commissioners. The management of the lights in this district had already devolved on the Minister of Marine and Fisheries, under the Act 33 Vic, chap. 18, and the lights and lightships formerly managed by the Trinity House, Montreal, had been managed by the Department, all matters connected with pilotage, buoys and beacons having been managed by the Harbor Commissioners.

The loss of life by accidents, in connection with the steamboats in the inland waters of the Dominion, during the calendar year 1872 was twenty-four, which was much larger than usual, owing to the heavy loss of life by the burning of the steamer "Bavarian," by which accident twenty persons lost their lives, of whom six were passengers, three of them being ladies. This accident caused much excitement among persons interested in the lake navigation; and it seemed necessary that some amendments should be made in the Steamboat Inspection law, so as to increase the size or number of boats carried, and make provision for lowering them readily, and training the crew to handle them quickly in case of accident. Many persons also urged the department to procure legislation, by which the masters and mates of steamers and other vessels trading on the coasts and lakes of Canada might be prevented from acting as such masters or mates until they had each passed an examination, and procured a certificate of competency or service from the Government; and additional legislation was passed providing for more boats, fire-pumps, fire-extinguishers, additional hose, training and exercising crews in lowering the boats at least once a week; and for the examination of masters and mates of vessels running on the inland waters and on the coast.

During the early seventies, and in fact for many years thereafter, the Minister and many of the officials of the department found themselves much engrossed in the vexed international question of the fisheries; but that is a matter treated of in another chapter (viii.)

A Comprehensive Act relating to the shipping of seamen was passed during the session of 1873 and came into operation on March 27th, 1874, shipping offices being established in accordance with its provisions.

By the provisions of another Act, passed during the session of 1875. (Vic. 38, cap. 55), entitled, "An Act respecting the Trinity House of Quebec," the function of that body together with its property, were transferred to and vested in the Quebec Harbor Commissioners, and the Corporation of the Trinity House was dissolved on January 1st, 1876.



DOMINION ICE-BREAKER AT WORK

CHARGING A GAS BUOY

CONSTRUCTION ON THE ICE CRIB WORK PIERS FOR LAKE ST. PETER LIGHT-HOUSES

There elapsed an interval of many years before there was any further addition to the functions of the Marine and Fisheries Department, and in the meantime there was some lack of interest shown in Canadian maritime matters and a decadence in Canadian shipping. This was largely due to the marked decline of ship-building in the Dominion, a result of the substitution of iron, and latterly, steel, steamships, for the wooden sailing craft of former days. And public attention was largely directed to the establishment of railway communications to the exclusion of matters affecting shipping.

But although the steel highway is extending so marvelously and has already become a vitally important factor in the country's means of communication, it is, after all, but an auxiliary to the merchant marine, seagoing and inland. The very extension of the railways themselves has necessitated the enlargement and improvement of the country's harbors and waterways.

Nevertheless it is a fact that the railroad and the steamship had well nigh outgrown the capacity of the country's water highways, threatening the Dominion's carrying trade with dislocation and disaster, before public interest was aroused to the obvious national duty of improving the comparatively neglected water routes and terminals, and equipping them with the elaborate appliances which modern science and mechanical skill has produced, and which the exacting requirements of modern trade demand. The opening up of the Northwest, and also of the Oriental trade, by the railways, with the facilities afforded by the various rail and water routes for the movement of the products of the interior to the seaboard, produced more freight than the seaports with their original equipments could advantageously handle. As Sir William Van Horne, then president of the Canadian Pacific Railway, comparing the Dominion to a grain elevator, put it: "The hopper is too large for the spout." The strides made in shipbuilding since the introduction of steel ship construction and steam motive power, particularly during the past twenty years, have of themselves been so revolutionary in character as to confront the water routes and terminals with an entirely new set of conditions. The sizes of both ocean and inland vessels has increased beyond all expectations; and increased size has been accompanied by much higher speeds. These developments in ship construction have made deeper and wider channels, more ample piers, and the perfection of the systems of lights and buoys and the other aids to navigation, not merely a desideratum but an imperative necessity, for it has become more and more apparent that routes closed by lack of accommodation to the modern ocean leviathan cannot compete with their rivals affording ample accommodation to the largest and swiftest products of the ship-yard.

Although Canada had taken, as has been related in another chapter, an historical and highly honorable part in the origination and development of steam navigation, inland and seawise, she appeared for a time to be oblivious to the tremendous changes being effected in the character of the shipping trade. The work of enlarging and re-equipping the harbors and ship channels, while not absolutely neglected, was proceeding in a leisurely kind of way compared with the rapid progress of the shipping industry. At length the risk of allowing this condition of affairs to exist was realized, and during the past six or seven years the work of improving the natural water routes and equipping them for the exacting requirements of modern trade has been taken up most seriously and energetically.

All of the considerable extensions of the scope of the Department since 1876 have been made since the present Minister, the Hon. Mr. Prefontaine, assumed the portfolio, November 11th, 1902.

The Hon. Mr. Prefontaine had been for many years intimately identified with the municipal administration of the Dominion's chief seaport, Montreal; and had, as a member of Parliament, and as a Harbor Commissioner and Chairman of the Harbor Improvement Committee, much to do with the amelioration of shipping facilities. Consequently he entered upon his duties in the Government with a practical knowledge of the conditions prevailing, and being pre-eminently a man of action, he lost no time in securing a more satisfactory condition of affairs. In fact, immediately upon assuming office he announced that the scope of the department was to be largely extended so as to give to the department most directly concerned the administration of all the public works designed for the use of the shipping of the Dominion. Previous to that time there was a peculiar intrusion of several of the other administrative departments of the government into the natural sphere of operations of the marine department, the result being an overlapping of authority, and a complication of administration, confusing and extravagant in themselves, and productive of very practical injury to Canadian commerce. For instance a portion of the St. Lawrence channel buoy system above Montreal was maintained by the Department of Railways and Canals. The same department, as also the Department of Public Works, had a staff of engineers regularly engaged in hydrographic work. All power of supervising works undertaken by the various Boards of Harbor Commissioners was vested in the Minister of Public Works, depriving the Minister of Marine and Fisheries of all authority over those bodies, which, as if to make this anomalous position all the more absurd, exercised complete authority in pilotage matters. And as if this were not enough, the management and control of the country's main waterway, the ship channel between Montreal and Quebec with all the dredging plant and steamers engaged in dredging and sweeping it, were under the control of the De-

partment of Public Works, again ignoring the department particularly charged with the interests of shipping and questions affecting the navigation of Canadian waters.

With the object of more efficiently organizing the different branches of the public service relating to navigation under the immediate control of the department directly responsible for the buoys, light-houses, pilotage and all questions of navigation, the entire management and control of the River St. Lawrence Ship Channel, together with the dredging and sweeping plant, steamers, and other appliances hitherto used by the Department of Public Works in connection therewith, were, under the provisions of an Order-in-Council, dated July 1st, 1904, passed over to the control of the Department of Marine and Fisheries. The Government Ship Yard at Sorel, where the dredging plant is constructed and repaired, together with the shops, stores, etc., were also transferred.

To systematize and facilitate all the work done by the Canadian Government in connection with the important work of hydrographic surveys, the whole administration of this branch of the public service has been assigned to the Department of Marine and Fisheries, and an Order-in-Council of July 23rd, 1904, transferred the hydrographic work of the Department of Public Works, and of Railways and Canals, to this Department.

The same Order-in-Council directed that the duties, powers and functions, with respect to any work or class of works conferred upon the Minister of Public Works by any acts relating to Harbor Commissioners, be transferred to and exercised by the Minister of Marine and Fisheries.

In 1902 the lights and buoys in the St. Lawrence above Montreal maintained by the Department of Railways and Canals, were transferred to the Department of Marine and Fisheries. At the beginning of the season of navigation 1904, the Pilotage Service between Montreal and Quebec was taken from the management of the Harbor Commissioners of Montreal and placed in charge of a superintendent responsible to the Department of Marine and Fisheries.

During the session of the Dominion Parliament of 1905 the Minister of Marine and Fisheries succeeded in obtaining the passage of legislation in virtue of which the control of the pilots below Quebec passes directly into the hands of the Department, thus completing the provision for the reorganization of the whole St. Lawrence pilotage service. It is announced that the Minister has his plans laid for a drastic, and apparently much-need reform in this connection, which will result in a much higher standard of technical knowledge and general efficiency on the part of the pilots being enacted.

It will be observed that a great deal has been effected during the past few years, in the direction of systematizing the public services concerned in the navigation of Canadian waters and the shipping interests of the country, and bringing them together into one harmonious system, under the direction of the public department specially charged with those interests.

And if much has been accomplished during the past few years in the matter of reorganization within the department, and the enlargement of its scope, even greater progress has been made in the practical work of providing new and improved aids to navigation and additional departmental equipment. A few figures will illustrate this fact.

The total expenditure of the Department of Marine for the fiscal year 1904, compared with 1896* was as follows:

	1896.	1904.
Ocean and river service	$181,451 71	$ 437,009 28
Lighthouse and coast service	466,057 55	1,226,398 18
Scientific institutions	81,699 92	131,673 94
Steamboat inspection	26,321 27	33,723 12
Marine hospitals	36,683 36	50,301 78
Civil govt. salaries	70,703 71	77,419 11
Hudson Bay expedition	.....	178,638 94
Contingencies	.....	1,210 00
Total	$862,917 52	$2,058,955 24

So that in the seven years ending 1904, the amount of money spent by the Department had considerably more than doubled, a fact in itself indicative of rapid progress. During the current year (1905) there has been an even more decided increase as stated already, but at the moment details are not procurable. An examination of the preceding table reveals the fact that the largest increase in expenditure is in connection with the "Ocean and River Service" and the "Lighthouse and Coast Service."

The former of these services includes the maintenance and repairs to Dominion steamers, tidal service, rewards for saving life, etc., wireless telegraphy, winter mail services, examination of masters and mates, naval schools, etc. The expenditure on account of the maintenance of and repairs to Dominion steamers for the fiscal year 1903-04 was $306,171.01, a goodly proportion of the whole item.

* Exclusive of course, of expenses connected with St. Lawrence Ship Channel ($588,000), and various new services taken over from other Departments.

The staff of the Marine and Fisheries Department at Ottawa consists of the following:—

Minister of Marine and Fisheries, Hon. Raymond Prefontaine; Deputy Minister of Marine and Fisheries, Lieut.-Col. F. Gordeau; Chief Clerk, W. L. Magee; Chief Clerk and Accountant, A. W. Owen; Chief Clerk, Cameron Stanton; First Class Clerk and Nautical Adviser, M. P. McElhinney; Commissioner and General Inspector of Fisheries for Canada, E. A. Prince, B.A., F.R.S.C.; Chief Clerk and Assistant Commissioner of Fisheries, R. N. Venning; Commander of Marine and Fisheries Protection Services, O. G. V. Spain; Private Secretary to the Minister and First Class Clerk, J. d'E. Clement; Chief Engineer, W. P. Anderson; Assistant Engineer in charge of Tidal Survey Service, W. Bell Dawson, D.Sc., F.R.S.C.; Assistant Engineer in charge of Draughting Office, B. H. Fraser; Engineer "St. Lawrence Ship Channel," F. W. Cowie; Hydrographic Surveyor in charge of hydrographic surveys, W. J. Stewart; Assistant to Chief Hydrographic, S. J. Chapleau; Commissioner of Lights, J. F. Fraser; Assistant Commissioner of Lights, W. H. Noble; some fifty clerks.

The first Deputy Minister of Marine and Fisheries was Mr. William Smith, appointed November 11th, 1867, resigned May 1st, 1896.

The office was divided in 1884, Mr. Smith continuing as Deputy Minister of Marine, and Mr. John Tilton being appointed Deputy Minister of Fisheries.

Mr. Tilton was superannuated December 1st, 1891, when the office was again united under Mr. Smith.

Lieut.-Colonel Frs. Fred. Gourdeau, the present Deputy Minister of Marine and Fisheries was appointed in succession to Mr. Smith, May 1st, 1896.

In addition to the staff at Ottawa there is an outside service, under the jurisdiction of the department, numbering about 2,000. It consists of the agents and their respective staffs; superintendents of Lights; Lightkeepers throughout the Dominion; Officers and crews of Dominion steamers and vessels, including the Fisheries Protection Service; coxswains of life-boats; inspectors of steamboats; inspectors of shipments of live stock; examiners of masters and mates; officers and servants in marine hospitals; shipping masters; harbour masters; meteorogical observers; officers of observatories; hydrographers and civil engineers, their assistants and machinists; surveyors of wrecks; wharfingers; attendants at humane establishments, also messengers employed in the several agencies and in the meteorogical office at Toronto.

Besides the above mentioned there are seventy-six registrars of shipping who act under the direction and control of the department, but are at the same time collectors of customs at the various ports of registration, but receive no fees in their capacity of registrars. There are ninety-five measuring surveyors of shipping throughout the Dominion, who act as officers of the department and are remunerated from their fees of office, although in addition to such fees, many of them hold positions in the Customs Service. Also in addition to the above, by orders in Council, of April 21st, and December 2nd, 1874, the Chief Officer of Customs at each port in the provinces of Quebec, Nova Scotia, New Brunswick, British Columbia, and Prince Edward Island, where no separate shipping office has been established is to be held and deemed a shipping master, is to receive the fees, make yearly returns to the department and act in that capacity under its directions.

CHAPTER VI

Aids to Navigation.

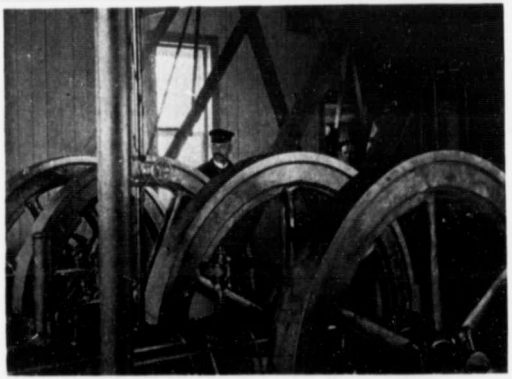
Lightships, Lighthouses, Buoys and Signals.—The Submarine Signal and Wireless Telegraph.—The Hydrographical Survey and Meteorological Services.

With such extended sea coasts and long lines of inland navigation the establishment and maintenance of artificial aids to navigation is a matter of vast importance and great expense.

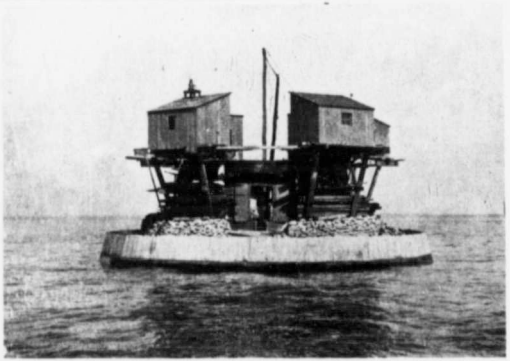
During the French regime the St. Lawrence was surveyed and charted, and "painted towers and other signals" erected on islands and shores for the guidance of the pilots at difficult points of navigation, such as the Traverse, the most dangerous part of the channel below Quebec. Those simple aids to navigation were removed before the fleet of Admiral Saunders, conveying Wolfe's army to Quebec ascended the St. Lawrence in 1759; but all the men-of-war and transports found no difficulty in the passage, although some of them had no further guide than the lead.

There were also beacons and lights established in Nova Scotia at this time.

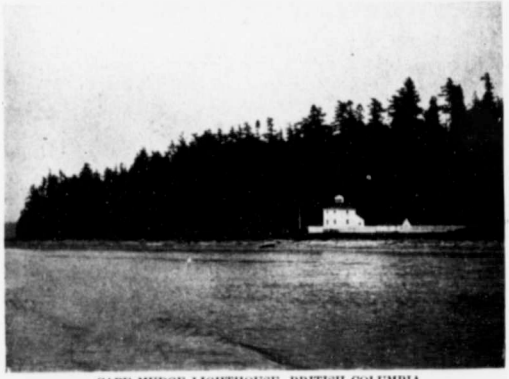
Soon after the cession, the British authorities were strongly urged by the mercantile community to correct the charts, erect beacons and



FATHER POINT (QUE.) FOG ALARM—THE MACHINERY



PELEE PASSAGE LIGHTHOUSE—FOUNDATION PIER 7



CAPE MUDGE LIGHTHOUSE, BRITISH COLUMBIA

D. G. S. SURVEY PARTY ASHORE AT HOLE-IN-THE-WALL, B.C.

lights, and otherwise provide for the safer navigation of the Gulf and River St. Lawrence. Frequent and ghastly shipwrecks proved weighty arguments in support of the merchants' petitions, but during the period of unrest and invasion which soon followed the British conquest there was not much done in the way of providing aids to navigation.

The settlement of Upper Canada by the United Empire Loyalists was followed by an increase in lake shipping, and early in the history of the province steps were taken to provide aids to navigation.

A lighthouse was begun on what was then York peninsula, but is now Toronto Island at the point known as Gibraltar Point, before the close of the last century. The building was then begun but evidently was not completed, for in 1803 an Act was passed by the Provincial Legislature for the establishment of lighthouses on the south-westernmost point of a certain island called Isle Forest, situated about three leagues from the town of Kingston in the Midland District, another upon Mississaga River near to the town of Niagara, and the other upon Gibraltar Point. It was not practicable to carry the Act fully into effect before 1806 at the earliest. According to the Act a fund for the erection and maintenance of these lighthouses was to be formed by levying three pence per ton on every vessel, boat, raft, or other craft of ten tons burden and upwards doubling the point named, inward bound. The collection of dues began before work on the construction of the lighthouses. That a lighthouse duty should be levied at ports when there was actually no lighthouse became a grievance, and in 1808 it was enacted that no vessel, boat, raft, or other craft of burden of ten tons and upwards should be liable to pay any lighthouse duty at any port where no lighthouse was erected, any local law or usage to the contrary notwithstanding. In the York *Gazette* of March 16th of the same year the announcement was made that "a lighthouse is about to be immediately established on Gibraltar Point at the entrance to York Harbor."

The old legislature of Lower Canada also devoted some attention to the question of aids to navigation, and among several important acts passed in 1829 was one for the erection of lighthouses on the shores of the St. Lawrence, and another for the improvement of the internal communications. The resolutions of the Assembly, on which the bill providing for the erection of the new lighthouses was framed, are interesting for several reasons, and particularly as indicating a spirit of co-operation even in those days between the provinces since combined to form the Dominion of Canada. The two resolutions read as follows :

"1. Resolved, That it is the opinion of this committee, that it would be advantageous to the trade of the country, and facilitate the navigation of the River St. Lawrence, were lighthouses built at the east and west end of the island of Anticosti, and at Point des Monts, and a floating light established at a convenient place in the Traverse.

"2. That it is the opinion of this committee, that a sum not exceeding £12,000, cury., be placed at the disposal of His Majesty, for the purpose of building and establishing the said lighthouses.

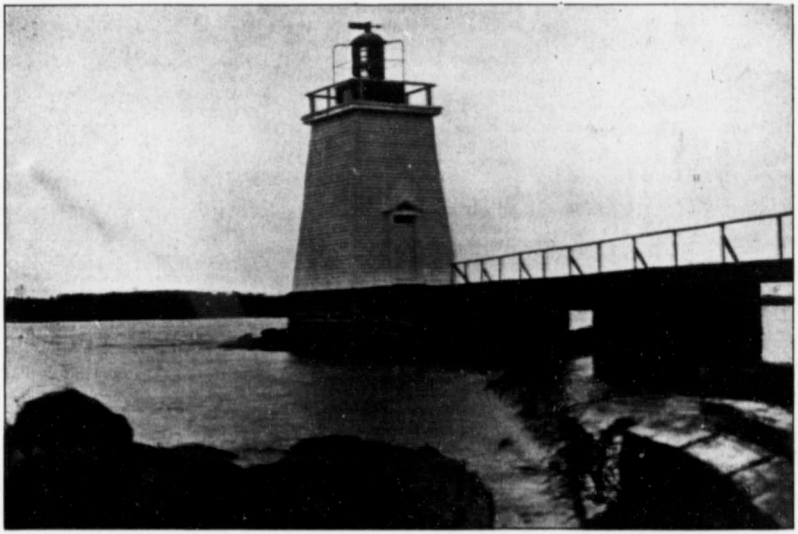
"3. Resolved, That it is the opinion of this committee, that the annual expense of maintaining the said lighthouses, be defrayed from the monies levied under the act of the 45th Geo. III. chap. 12, and that the surplus of the said monies, after paying the ordinary expenses authorized by the act, be appropriated towards refunding the said sum of £12,000.

"4. Resolved, That it is the opinion of this committee, that as soon as His Majesty's government for the island of Newfoundland, the legislature of the provinces of New Brunswick, Nova Scotia and Prince Edward's Island, shall provide for the building of lighthouses and the island of St. Paul and on Cape Ray, and grant aids for these purposes, it will be expedient to grant a proportionate sum on behalf of this province."

"1. Resolved, That it is the opinion of this committee, that it is expedient, in conjunction with the provinces of New Brunswick and Prince Edward's Island, to provide for the erection of a lighthouse on St. Paul's Island, the consent of the government of Nova Scotia being first obtained for such erection and for the permanent management of the lighthouse on the said island.

"2. Resolved, That it is the opinion of this Committee, that considering the expense about to be incurred for the erection and maintenance of four new lighthouses between the entrance of the Gulf of St. Lawrence and the principal port of entry for the provinces of Upper and Lower Canada; and considering also the actual annual expense of the lighthouse on Green Island, and of the establishment on the island of Anticosti, for affording succor to vessels in distress, the revenue collected at Quebec ought to contribute one-third part of the expense of erecting and maintaining the said light on the island St. Paul, or on either of the Bird or Magdalen islands.

"4. Resolved, That it is the opinion of this committee, that an humble address be presented to his excellency the administrator of the government, praying his excellency will be pleased to communicate the foregoing resolutions to the respective governments of the Provinces of New Brunswick, Nova Scotia and Prince Edward's Island, and that his excellency will be further pleased to adopt such measures as he may deem expedient for corresponding and communicating with commissioners appointed by the Lieut.-Governor of New Brunswick, and with any that may hereafter be appointed by the governments of the other Provinces, for the purpose of establishing a lighthouse on St. Paul's Island, or any other place that may be considered mutually advantageous to the trade of these provinces."



RED HORSE ROCK LIGHTHOUSE, THOUSAND ISLANDS, ONT.

The lighthouse on Pointe des Monts was finished during the summer of 1830 and in use from October to the close of the navigation of the St. Lawrence, to the convenience and safety whereof it materially contributed.

The Montreal Board of Trade was an active agent in drawing public attention to the needs of improved aids to navigation. In 1847 the Council of the Board urged the importance of the improvement of the internal communications in every way, and the establishment of lines of ocean steamships. In 1850 the Council urged that the lake channels should be lighted and the pilotage service better performed. In 1854 the Montreal Board of Trade memorialized the Government on the importance of lighting the Straits of Belle Isle and the harbors of refuge below Quebec. In 1855 and for several succeeding years a project for a canal to connect Georgian Bay with the Ottawa River was much discussed by the Board. In 1863 delegates were received by the Board from Illinois and Wisconsin who came to Canada to urge the construction of the Ottawa and Georgian Bay ship canal.

In Ontario and Quebec above Montreal, there were in the year of Confederation (1867) sixty-seven lights, of which five were floating, maintained at the expense of the General Government during the season of navigation, with fifty-four keepers and six assistants, in some cases there being two lights under one keeper. These lights were under the immediate supervision of a superintendent, who visited them whenever necessary, and supplied them with the requisite stores For the financial year ended June 30th, 1868, the sum of $43,000 was voted by Parliament to defray the expenses of these lights, and the actual expenditure amounted to $40,561.28

Between Montreal and Quebec the Trinity House of Montreal at the time of Confederation managed the lights, which were principally of a small description, suitable for river and navigation. There were forty-one lights under the management of this Corporation, of which three were floating. For the year ended June 30th, 1868, the sum of $26,000 was voted by Parliament for the services of the Trinity House, Montreal, including the salaries of the officers, and the sum of $23,053.56 was expended on that account.

The lights below Quebec in the River and Gulf of St. Lawrence extending to the Straits of Belle Isle, were managed by the Trinity House of Quebec. Those in the river were principally of a minor description, but the lights in the Gulf and Straits of Belle Isle were sea lights. The number of these under the management of the Trinity House, Quebec, was twenty-three, including one floating light (at the south traverse at the north-east part of St. Roche shoals)

The amount voted by Parliament to Quebec Trinity House for the year ended June 30th, 1868, was $46,739 and the amount expended by that body was $45,615.65.

There were no light duties or charges for the support of the lighthouses in Ontario and Quebec, during the year ended June 30th, 1868.

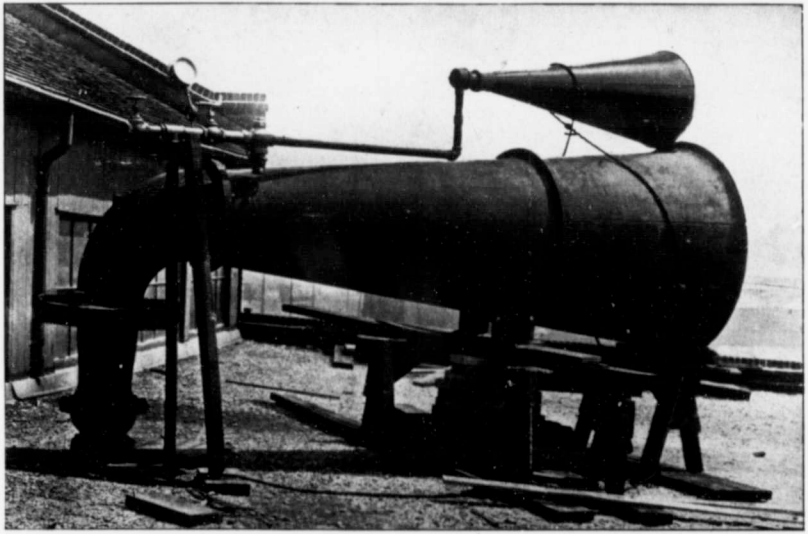
In New Brunswick, the lighthouses, buoys and beacons, were formerly maintained by a tonnage duty on shipping, which continued until May 22nd, 1868, when it was abolished by an Act of the Parliament of the Dominion.

There were at Confederation fifteen lights in New Brunswick, including two on Machias Seal Island, with fourteen keepers and two assistants. They were principally good sea lights. There were also ten minor lights with five keepers. There was also a superior steam fog-whistle, on Partridge Island, at the entrance of St. John Harbor, which had even then proved of great service to the shipping during the thick fogs and heavy snow storms which sometimes prevail there. The sum of $24,100 was voted by Parliament for the year ended June 30th, 1868, for the services of lighthouses, fog whistles, buoys, beacons, and signal stations in New Brunswick, including the construction of a temporary beacon at St. John Harbor, and the expenditure amounted to $20,227.45.

In Nova Scotia the lighthouse service was formerly maintained by a tax on shipping, but on April 1st, 1868, the act under which the tonnage duty was collected, expired and was not renewed, and collections in that Province on account of this service consequently ceased at that time. There were in 1869 fifty-nine lights in Nova Scotia, nearly all of which were good sea lights. There were also two fog-trumpets, one at Cranberry Island, Cape Canso, and the other at Sambro Island, near the entrance at Halifax Harbor, worked by caloric engines, but they were both in a very inefficient state

The Dominion Act of 1868, 31 Vic., ch. 59, in placing the lights, buoys, beacons, etc., under the control of the Minister of Marine and Fisheries, reserves to the Trinity House the jurisdiction and powers over all of such said lights, buoys, beacons, etc., as were previously under the control and management of the Corporation, but subject to instructions from the Minister of Marine and Fisheries.

The lighthouses and floating lights of the Dominion of Canada, on June 30th, 1869, numbered 221, and four fog whistles or trumpets, and the aggregate cost of maintenance of these lights and whistles, with the signal stations, humane establishment, buoys, and beacons for the financial year ending on that day, including salaries and contingencies of the two Trinity Houses, the necessary staff of officers to manage the business in New Brunswick and Nova Scotia, the salaries of keepers, cost of oil, repairs, fuel, and other stores, amounted to $203,496.27.



A DIAPHONE AND SIREN (FOG SIGNALS) BEING TESTED

The lighthouses and floating lights in Ontario and Quebec above Montreal were managed direct by the department, while the more immediate oversight of these lights was entrusted to a superintendent who travelled about from place to place, attending to the necessary repairs, which were constantly being required, and furnishing them with the requisite supplies to keep them in efficient working order. The supervision of this officer extended from the lighthouse at the pier at the entrance of the Lachine Canal to the lighthouse at St. Ignace Island in Lake Superior, a distance of coast equal to 1,500 miles. In this district there were, on June 30th, 1869, sixty-seven lights, of which five were floating, maintained by the general Government, under the control of the department, in addition to which there were several harbor lights on the lakes, which were sustained and managed by the local authorities.

By the Act 33rd Vic., cap. 18, authority was given to the Minister of Marine and Fisheries, to construct such lighthouses, beacons and other public works connected with his department as His Excellency in Council might direct. Such work had previously been done by the Public Works Department.

The Act, entitled "An Act to amend the Act, relating to lighthouses, buoys and beacons," (33rd Vic., cap. 18) transferred the management of all the lighthouses, light ships, buoys and beacons in the Quebec Trinity House District to the Department but it was not considered advisable to make any change in the mode of managing them, in the middle of the session, in case it might have interfered with the efficient working of these important services at a time when they were most required, and the change was made until the end of the season.

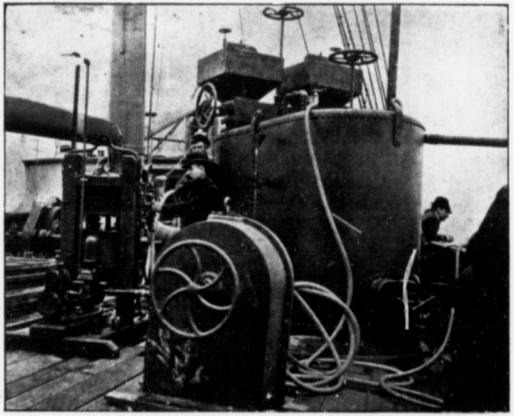
During 1871 it was decided to appoint a new responsible official to be known as General Superintendent of Lighthouses and Constructive Engineer, which officer became absolutely necessary when the Department assumed the duties of construction of new lighthouses, steam fog whistles, and other works in connection therewith. Such an officer was also very much required in the maintenance of the lighthouse service throughout the Dominion, as engineering questions were constantly arising in the administration of the lighthouse service with its lighting apparatus, machinery, buildings, wharves and piers attached thereto. Mr. Joseph Tomlinson, who had formerly been employed by the Government of New Brunswick, was appointed to the office alluded to, on May 5th, 1871, although he had been temporarily employed by the Department for fifteen months previous to that date. This officer had immediate charge of the administration of all the lighthouses in the Dominion which were maintained by the Government of Canada, including three first-class lighthouses then recently erected on the coast of Newfoundland for the benefit of Canadian shipping entering and leaving the Gulf of St. Lawrence, either by the Straits of Belle Isle or by the southern entrance of the gulf. These new lighthouses were erected at Cape Norman near the north-east entrance of the Straits of Belle Isle, at Point Rich, near the south-west entrance of the Straits, and at Cape Ray on the northerly side of the southern entrance of the Gulf of St. Lawrence. The number of lighthouses which were then (1871) managed by the Department, including those managed by the Trinity House, Montreal, the three already mentioned in Newfoundland, and two at British Columbia, was 251. He also had charge of the administration of eleven lightships, including three in the River St. Lawrence below Quebec, three between Montreal and Quebec, four in Lake St. Louis, above Montreal, and one in British Columbia. In addition to these there was a lightship stationed at Colchester Reef, Lake Erie, which had been hitherto maintained principally by private subscriptions from owners and masters of vessels and underwriters' associations, but during the season of 1871 the sum of $500 was paid to the owners of the vessel alluded to, by the Department, the amount having previously been voted by Parliament for this purpose, as it was found to be a very useful and important light to the shipping trade on Lake Erie.

Besides, there were under the administration of the Department, eight steam fog whistles, including one in the iron lightship which was stationed during the season of navigation below Red Island Reef, in the River St. Lawrence. Four more were under contract at the end of the year, and one about to be contracted for, making thirteen, which the Department hoped to have in operation early in the season of 1872.

The Trinity House of London, which is the chief lighthouse authority in the United Kingdom, in 1872 sent out to this country a committee of their corporation, with the object of examining the fog signals in use in Canada, and the United States of America, and obtaining information as to their power and efficiency, and also acquainting themselves incidentally as far as time would allow, with the working of the lighthouse system in the two countries.

Commenting on the report made by these two gentlemen, the Hon. Peter Mitchell, then Minister of Marine and Fisheries, made some interesting comparisons in his annual report. He remarked :

"I may here mention briefly, that the difference between the Canadian, and British, and United States systems of lighthouses is simply this. In the United Kingdom, where there is much wealth, and abundance of scientific talent when required, and where the lighthouses are maintained by a sytem of light dues on shipping, no expense is spared in rendering the services thoroughly efficient. The buildings are all of the most substantial and durable description, built of stone or iron, and the apparatus is nearly all on the dioptric principle, which is very



PORTABLE ACETYLENE GAS PLANT OPERATING ON STEAMER'S DECK

GAS PLANT IN LIGHTHOUSE DEPOT

powerful but expensive, although consuming less oil than the catoptric system.

"In this country, with the exception of about twenty very superior costly lighthouses, having stone towers, and nearly all having very expensive dioptric apparatus, the bulk of the lighthouses are mostly of a cheap but substantial description, made of wood, with iron lanterns, and fitted up with catoptric apparatus. A few of the lighthouses have wooden lanterns, which are cheaper than iron lanterns, although not quite so safe. A good and powerful sea light, on the catoptric principle, in Canada, is fitted up complete with modern frame tower, oil shed, dwelling house, iron lantern and large circular-burner lamps, and powerful twenty-inch diameter reflectors, for about $8,000, under ordinary circumstances, and when no extraordinary difficulties intervene; whereas in the United Kingdom $100,000 would not be considered no extravagant sum for the outfit of one of their ordinary stone tower dioptric sea lights, and the cost of maintenance would certainly be two or three times as much as that of similar lights in this country. * * *"

These comments of Mr. Mitchell besides being historically interesting are useful in explaining why it has been found necessary to expend so much money in replacing or refitting some of the older lighthouses.

In the preceding chapter reference has been made to the increase in the scope of the Department due to the transfer to it of the functions of the Trinity Houses of Quebec and Montreal. For several years previous to 1889 the maintenance of the buoys and beacons on the St. Lawrence between Montreal and Quebec was attended to by the Montreal Harbor Commissioners under contract with the Department of Marine and Fisheries, the first named body having, with its channel dredging fleet, the plant for replacing and removing the buoys, and for inspecting them during the season of navigation.

January 11th, 1888, the Harbor Commissioners addressed a memorial on the subject to the Minister of Marine and Fisheries as follows :

"For several years past the maintenance of the buoys and beacons on the ship channel has been carried on by the Harbor Commissioners in connection with their work of deepening the ship channel. Certain officers and steamers have from time to time, been detailed for the buoy service, and for surveying and general attendance upon the dredging fleet, and when not needed in one service their time has been utilized in the others. The tugs acting as tenders to the dredges working at different points along the river, have also been always available and often close at hand in emergencies. In spring and fall, for instance, when the buoys have to be placed and taken up rapidly throughout the whole channel, or during summer, when buoys at different places happen to be simultaneously deranged, the requisite number of boats have been taken and assigned to different sections of the work.

"The system has the advantage of promptness and large resources for emergencies, and it is economical because only the time in which the boats are actually engaged in buoy and beacon work is charged to the service. On the other hand there is the disadvantage of having no steamer properly built and equipped for rapidly handling buoys, and the want of experience which would come from a boat's crew always being engaged at work.

"But in any case the system cannot be continued beyond the early part of next summer, when the channel will be completed above Capa-la-Roche, and the dredging fleet hitherto scattered along the river will be concentrated below.

"It is therefore necessary that other provisions be made for the maintenance of the buoys and beacons in future, and not only for this, but for other services pertaining to the navigation and maintenance of the ship channel. It will, for instance, be necessary that the bottom of the channel be systematically tested, from time to time, in order to detect filling up, and the deposit of dangerous obstructions, such as boulders, anchors, etc.

"Parts of the river which are changing or suspected of becoming shoal will have to be surveyed, vessels which ground or meet with other accidents will require to be visited, and their positions and the condition of the river bottom accurately ascertained.

"The public interests at stake in this case are too enormously great to be placed in jeopardy in this way, and the Commissioners therefore submit that the contract system for the maintenance of buoys is not applicable upon this part of the St. Lawrence. On the other hand, there are important considerations showing, as the Commissioners think, that the buoying should be continued under their supervision."

In November, 1888, the Commissioners again drew the Minister's attention to the subject, and also pointed out that the yearly appropriation of $7,000 hitherto made by the government for the service had been insufficient, and that in future the cost of maintenance would be greater than in the past, when the channel fleet was distributed at different points.

In 1889, the Department relieved the Commissioners of this service, and has since attended to it with its own officers and plant.

The heavy increase in the expenditure on account of the Lighthouse and Coast Service of Canada indicates pretty clearly the additional number of lighthouses, fog-alarms, buoys, etc., and the general expansion and improvement of this vitally important service. As conveying some idea of the increased attention bestowed in recent years upon

LAWYER ISLAND LIGHTHOUSE, BRITISH COLUMBIA

SAND SPIT LIGHTHOUSE, ST. ANDREW'S HARBOR, N.B.

the several branches of this service, the following comparative statement of expenditure for the Lighthouse and Coast Service for the fiscal years 1896 and 1904 is edifying :

	1896.	1904.
Salaries and allowances of lightkeepers	$199,348 61	$230,179 61
Maintenance and repairs to lights	225,691 07	982,178,34
Construction of lights	17,662 28	572,192 87
Agencies, rents and contingencies	15,372 14	20,866 28
Signal service	5,338 76	7,740 01
Repairs to wharves	2,644 69	1,300 89
Salaries of temporary officials	.....	11,448 10
Total	$466,057 55	$1,226,398 18

An analysis of this statement shows that the cost of the maintenance of the Lighthouse and Coast Service was $448,395.27 in 1896 and $685,723.11 in 1904, while $17,662.28 was spent in the construction of lights in 1896 and no less a sum than $540,675.07 in 1904.

The additions to, and improvements effected in the light and buoy services, are the result of careful consideration of the requirements of navigation, and the merits of scientific investigations and mechanical inventions from year to year. The number and character of the additions made during and since the year 1903 are most noticeable, due to the increased number of applications for lighthouses and fog alarms, inspired by the adoption of a progressive policy by the present administrations.

From 1896 to 1904, inclusive, 183 towers and enclosed lighthouses were built, and 50 pole lights erected, making 233 new lights put in operation. The following comparative statement shows the total number of lights maintained in the Dominion of Canada in the years 1896 and 1904.

	1896.	1904.
Light Stations(*)	616	826
Light Ships	13	15
Pole Lights	136	186
	765	1,027

Two steel lightships completed in 1903 cost no less than $100,000 each and have the most approved equipment and illuminating apparatus, their electric lights being visible thirteen miles from all points of approach. One of these lightships has been placed upon the Lurcher Shoal in the Bay of Fundy, the other stationed on the north-east coast of the Island of Anticosti.

The description of one of these vessels, the one off the Lurcher Shoal, outside of Yarmouth, N.S., whose station is in about thirty-six fathoms of water, will answer for both.

She is a steel steamer, with two masts and no bowsprit. The hull is painted red, with the word "Lurcher" in white letters on each side, and the number of the vessel, "No. 14," on each bow. The circular gallery under the lanterns at each mast head, the smoke stack, and the fog signal between the masts, are all painted red. Three seventh-order lens lanterns encircle each mast head, at an elevation of sixty feet above the water. From them occulting electric lights, showing bright for eight seconds and eclipsed for four seconds, alternately, are exhibited. These should be visible thirteen miles from all points of approach. If from any cause the electric light apparatus should become inoperative, fixed white oil lights, of less intensity, will be shown. A diaphone, operated by compressed air, is used as a fog alarm. This is similar in sound to a siren, but gives a note of great intensity and uniform pitch. It will give blasts of four seconds' duration, with intervals of fifty-six seconds between the blasts. Should it become disabled, blasts of similar duration and frequency will be sounded through a whistle. Should both from any cause become inoperative a bell will be rung by hand. The vessel was built under contract by the Polson Iron Works, of Toronto, their original contract price being $89,975.

In September, 1904, she was fitted with a submarine bell, by the Submarine Signal Co., of Boston, Mass., which bell, during thick weather, will strike the ship's number, 14, every twenty-three seconds, as follows: One stroke, five seconds interval; four strokes at intervals of two seconds; then an interval of ten seconds. There may be slight variations in these intervals, owing to varying pressure of air or steam used to operate the signal.

Vessels equipped with receiving apparatus are expected to be able to hear the bell at five miles, and determine its bearing within a quarter point. Vessels not so equipped should receive a warning signal at from one to two miles, depending on the construction of the ship. This should be audible to an observer below the water line and close to the hull of the vessel.

Instructions were given to have the bell rung on the approach of any vessel within five miles, and masters of vessels were requested to report as to the distance the bell was heard, with any other particulars noted respecting this new aid to navigation.

* The fog-alarm stations operated by machinery are included in this number.

With the object of carrying out the Minister's desire for the improvement of the lighthouse service, and the consideration of all cognate matters, by Order-in-Council of February 26th, 1904, the Lighthouse Board was organized, consisting of the Deputy Minister of Marine and Fisheries as Chairman; the Chief Engineer of the Department, the Commander of the Canadian Marine Service, the Commissioner of Lights, and Mr. Hugh Allan, of Montreal, as representing the shipping interests generally.

The function of the Board are, to consider all applications for the improvement of the Lighthouse Service, the establishment of additional aids to navigation, and such matters as tend to the protection of the life and property of those engaged in the mercantile marine of the Dominion. The Board meets from time to time as necessity arises, and its decisions, if sanctioned by the Minister, are carried into effect. While the Board has only been in existence for a comparatively short time, the work already accomplished through its agency has proved highly satisfactory to the shipping interests and is much appreciated by the travelling public and those engaged in navigation.

During the period between the construction of the Lighthouse Board and January 1st, 1905, ten meetings were held, and the recommendation for improvements in existing aids to navigation, and the establishment of new aids, agreed upon, submitted to the Minister and approved by him, aggregated the estimated sum of $352,588, divided amongst the different provinces as follows :

Quebec (St. Lawrence route)	$184,073
Lights on Newfoundland coast maintained by the Government of Canada	56,000
New Brunswick	45,500
Nova Scotia	32,515
British Columbia	15,300
Ontario	12,200
Prince Edward Island	7,000
Total	$352,588

It will be noticed that of the total amount recommended by the Board to January 1st, for expenditure on lights, etc., nearly two-thirds is intended for the St. Lawrence route, in connection with which the Department is committed to extensive improvements.

Included in this sum of $352,588 is a considerable proportion for new dioptric apparatus for the important sea-coast lights.

During the season of navigation 1903-04 there was brought to the attention of the Department, by the Submarine Signal Company of Boston, Mass., a new aid to navigation in the form of a submarine bell, which invention, upon being reported favorably to the Board, was recommended by the Board for adoption in Canada. In all, thirty-eight of these bells have been located on the St. Lawrence route and the Atlantic Coast, and they promise to be invaluable aids to navigation. This system of submarine signalling consists of the application to the practical requirements of navigation of the well-known property possessed by water, as an exceptionally good conductor of sound, this application being effected by means of a transmitter constructed on the principle of the familiar telephone apparatus. The idea is to transmit warning signals to ships through the water without the use of wires from (1) A lighthouse or other shore station, by means of a bell suspended in the water connected by a cable with the lighthouse or shore station; (2) By means of a bell on a lightship immersed in the water, and rung either automatically by the motion of the lightship, or mechanically or electrically; (3) By means of buoys operating bells in the water.

The warning signals sent out are received by ships equipped with receiving apparatus consisting of transmitters, one on either bow of the ship, the impulses received being transferred electrically to the pilot house of the ship to "receivers."

By means of the receiving apparatus the direction of the signal may be determined within from one-quarter to one point, depending on the skill and practice of the observer, and depending also on the distance from the ringing bell.

The system is in use in United States waters, and the bells used on the United States lightships between New York and Boston, gave a clear unmistakable sound at five miles, and at times were heard by the officers of the Canadian Marine Department sent to investigate from ten to twelve nautical miles.

Captain Koeing, of the D.G.S. Canada, according to a report of Mr. J. U. Gregory, Agent of the Department of Marine and Fisheries at Quebec, dated November 1st, 1904, heard the sub-marine bell on Anticosti Lightship at a distance of eleven miles. In a report, dated March 28th, 1904, Captain Archibald Reid, Port Warden of Montreal and Surveyor to Lloyd's Register, London, reports having satisfactorily tested the system. According to his report: "It was seen that the direction of the sub-marine bell could be obtained within a quarter to a half point invariably, and frequently closer than that.

The use of receiving apparatus enables the direction of the signal to be determined, and very largely increases the radius of warning, but in either wooden or iron ships a general warning sound may be obtained by an observer listening with the ear against the hull of the ship; and whether the signal comes from the port of starboard side, can be determined.

The submarine bell is not destined to replace air fog signals, but to supplement them, although there is no comparison between the reliability of the two signals. It is well known that the sound from a fog alarm may pass over a ship and be audible to a vessel farther away.

The limited range and extreme variability of air transmission of sound, due to differences in the density and temperature of the medium, to the interference of the wind and the smothering effects of snow, the drowning of the signals by other noises, the confusing effect of echoes, and the impossibility of accurately locating the sounds when heard, these, and other facts well known to mariners stamp the ordinary air fog-signal as unreliable. The superior reliability of submarine signals appeals to all, as the water, being a better conductor of sound than air, is also not subject to the same variable conditions. Sea water is of practically uniform density at all depths. The velocity of sound in water is more than four-fold its velocity in air, the distances traversed being about 1,100 feet per second in air and 4,700 feet in water, and the range of signals in the water is correspondingly greater. On the other hand the velocity of the tidal currents in the ocean is very much less than the velocity of the wind above its surface, which in storms frequently reaches thirty miles per hour. Below the surface of the sea there is practically no noise to conflict with the note of the signal bell, and abundant experience has proved that it can be heard and located as well during the most violent storm as in calm weather.

The advantage to shipping of wireless telegraphy has not been lost sight of, and under contract with the Department, the Marconi Company installed and equipped during the season of 1904 a chain of wireless signal stations along the Newfoundland coast, and the shores of the Gulf of St. Lawrence, which have already proved of practical utility to shipping.

During the season of 1904 Marconi stations were established at Fame Point, Quebec; Heath Point, Anticosti; Point Armour, Labrador; Belle Isle, Quebec; Cape Ray, Newfoundland; Cape Race, Newfoundland. They have all been working very successfully since some months before the close of navigation in 1904.

The station at Fame Point was finished on June 25th.

In the official test made by the government, communciation was held 130 miles to the eastward and 101 miles to the westward. The latter distance might have been improved upon, but it was deemed inexpedient to continue the test owing to the fact that the government steamer conducting the same was ordered elsewhere. The Heath Point Station was completed on July 21st. The official test of this station showed it to have an efficient range of about 130 miles, but on several occasions it has heard vessels even further.

The Point Amour station was completed on August 10th. This station in the official test made by one of the government steamers showed a range of 115 miles.

The Belle Isle station which was completed on September 1st is in constant communication with the Point Amour station which is situated some sixty-six miles to the westward, from the time it was opened until the close of navigation.

The station at Cape Ray, Newfoundland, was completed on October 7th. The official test of this station showed it to be entirely satisfactory, having an efficient range of about 100 miles.

The Cape Race station was completed on November 17th, and the official test of this station was also most satisfactory. The range of communication was fully up to that of the Cape Ray station.

All of the above stations have reported shipping and shipping intelligence to Lloyd's agent, at Quebec.

The Belle Isle and Point Amour stations have proved exceptionally valuable in communicating to steamers coming through the straits of Belle Isle news as to weather conditions prevailing in the straits.

In many instances vessels have been in communication with shore stations when enveloped in thick fog, and have found the Marconi system an invaluable supplementary aid to the fog signal services already existing. News of current events have been furnished by the stations to all vessels equipped with the Marconi apparatus. This has not only proved a boon to the passengers, but has undoubtedly tended to popularize the St. Lawrence route with the travelling public.

The important aid to navigation rendered by the Dominion of Canada in the matter of wireless telegraph, has been very greatly appreciated by the Shipping Federation of Canada and the shipping interests generally.

In 1903-04 the sum of $18,847.31 was expended in equipping Marconi stations, and in 1904-05 up to November 30th, $29,276.85 had been expended, including the cost of installing the apparatus on the Dominion Government steamers "Minto," "Stanley," and "Canada." The sum of $55,000 was placed in the estimates of 1905-6 for the new Marconi stations, which had been contracted for at Cape Rich, Newfoundland, and Whitle Rocks and Seal Island and Partridge Island; also increasing from low power to high power stations, to allow communication between Fame Point and Heath Point; Heath Point and Cape Ray; Heath Point and Whittle Rocks; Whittle Rocks and Cape Rich; and Cape Rich and Point Amour, and Seal Island and Partridge Island. Also to allow for a day and night service between said stations.

The work of extending the Dominion Government's Marconi wireless telegraph system along the Atlantic and Gulf Coasts was pushed with extraordinary dispatch during the season of navigation just completed, that of 1905. On January 1st, 1906, there were twelve Marconi

RIVER THAMES (ONT.), BACK RANGE LIGHT

LACHINE, LAKE ST. LOUIS (QUE.), BACK RANGE TOWER, GAS LIGHTED

stations under the control of the Department completed, and one, that at Cape Bear, approaching completion, all being high power stations but three, and providing unbroken intercommunication between all points along both shores of the Gulf of St. Lawrence, all points round Newfoundland, Sable Island, the shores of Nova Scotia and those of New Brunswick.

The complete list of these stations is as follows:

Fame Point, Gaspe.	Cape Whitte, North Shore Gulf.
Heath Point, Anticosti.	Point Amour, North Shore Gulf.
Cape Bear, Prince Edward Island.	Belle Isle, Belle Isle.
St. John, New Brunswick.	Cape Ray, Newfoundland.
Cape Sable, Nova Scotia.	Cape Race, Newfoundland.
Halifax, Nova Scotia.	Sable Island, Sable Island.

A glance at the map will show how well those stations have been selected, and how completely they bring vessels equipped with Marconi apparatus in communication with the land system at any point in the Gulf, as well as off the shores of Newfoundland and those of the maritime provinces, and also Cape Sable.

The station established on the last mentioned barren island, so well-known as the Grave Yard of the Atlantic, is of the greatest international importance, keeping that danger spot not only in communication with Marconi-equipped steamships passing off its dangerous shores, but with the mainland. Hitherto it was often impossible to communicate, even with Sable Island for periods of four or five months in the year. Now, Sable Island, thanks to its Marconi station, is one of the most important links of communication between seaborne traffic and the world at large.

These stations have been thoroughly tested and found in every case to be perfectly satisfactory. The mercantile interests have not been slow to appreciate the importance of this wonderfully perfect means of communicating with the world from far at sea, and the number of vessels engaged in the Atlantic trade equipped with the Marconi apparatus is increasing monthly.

The Department of Marine and Fisheries recognized the success of the system by equipping several more of the Dominion Government ships with the Marconi apparatus during the summer, those now equipped being the "Canada," "Lady Laurier," "Montcalm," "Stanley," "Minto" and "Druid."

The extended coast line of Canada, numerous bays, inlets, rivers, lakes, harbors, and other navigable waters, requires a large number of buoys. Annually the number of buoys has been increased, but in 1903-04 the increase was larger than any previous year.

The districts buoyed to the spring of 1905 numbered about 350, and the buoys numbered about 4,200. A very large number of new buoys have been placed in position during the present season (1905). A large number of whistling, bell and other iron buoys are maintained along the coasts of the several provinces, particularly on the Nova Scotia, New Brunswick and British Columbia coasts. These buoys are called coast buoys to distinguish them from harbor buoys.

In addition to the buoys for marking dangers, 106 buoys are maintained, showing in general occulting lights; twenty-two in the Quebec Agency, on the St. Lawrence River; forty between Portneuf and Montreal; thirty-one between Montreal and Kingston; one in Pelee Passage; one at the mouth of the Detroit River; three in Parry Sound; three in Georgian Bay; two at Port Arthur, and three in Halifax Harbor.

No opportunity is now lost for adopting the latest improvements in buoys, buoy moorings and buoy tenders. A really marvelous change has been effected in the past few years in these particular respects.

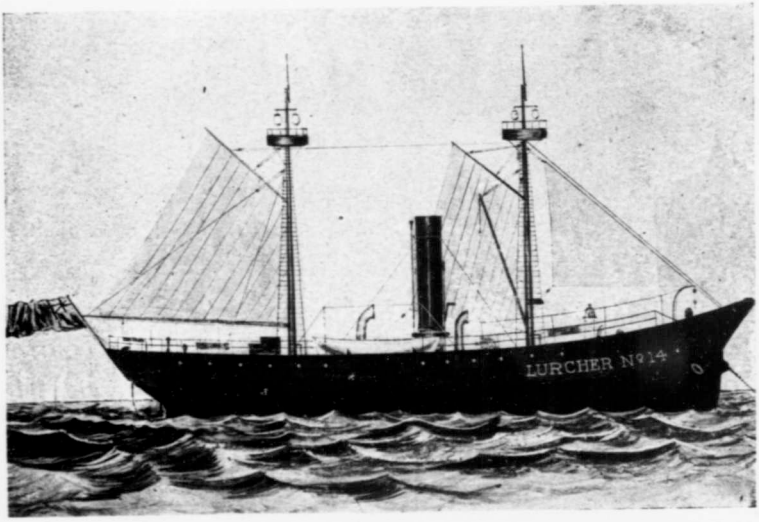
With a view of securing the best illuminant for the gas buoys that had been placed between Montreal and Kingston, experiments were made with acetylene gas. Difficulties had arisen from time to time in transporting pintsch or oil gas from Montreal or Quebec to the buoys, and it was assumed that the use of acetylene gas would enable the department, to a large extent, to increase the gas buoys and supply them with gas more effectively, than from Montreal.

In August, 1902, the experiments were begun, and a new acetylene apparatus designed and put in operation in 1903. The result of the experiments has been to increase the candle power five times, by the substitution of acetylene for oil gas.

A depot has been established at Prescott, a commodious property having been purchased for the purpose. Special apparatus for the light-house service is made at this depot and distributed.

Shortly before the closing of navigation in 1903, twelve gas buoys were placed between Sorel and Montreal, thus permitting night navigation between these points. Previous to that date the St. Lawrence ship channel between Quebec and Montreal was unnavigable at night to all but river craft and the smaller class of sea-going vessels, necessitating many hours' delay. During the shipping season of 1904 the work of lighting the ship channel from Grondines to Port St. Francis proceeded, twenty gas buoys placed at the salient points of the channel, and the necessary notices to mariners issued.

During the season of 1904 the use of acetylene as an illuminant for gas buoys and lighthouses was extended, and it was used in the St. Lawrence Ship Channel gas buoys from Grondines to Port St. Francis, and from Sorel to Montreal, in the Montreal-Kingston division, in the Parry Sound district, Halifax Harbor, and in the vicinity of Port Arthur, Ont. At the opening of navigation in 1905 acetylene buoys replaced



LIGHTSHIP "LURCHER" ON LURRCEH SHOAL, BAY OF FUNDAY

FATHER POINT (QUE.), FOG ALARM BUILDING—EXPERIMENTING WITH TRUMPETS

those using oil gas in the Quebec Agency and the mouth of the Detroit River.

An automatic acetylene buoy which carries its charge of gas in the form of carbide has been invented by Mr. Thomas L. Willson, of Ottawa, and accepted by the Department. The utilization of this buoy will permit an extension of the gas buoy service which before was impracticable on account of the difficulty and expense of transporting gas.

All of the forty-six lighthouses between Montreal and Kingston are now burning compressed acetylene, and also the range lights in the vicinity of Parry Sound.

The large increase in the tonnage and size of vessels on the Great Lakes necessitates a closer supervision and more frequent inspection than has obtained heretofore of the lighthouse and buoy system there. As a first step in this direction, authority has been obtained for the establishment of a buoy depot at a central point in the Georgian Bay, and the creation of the Georgian Bay and North Channel into a separate district will follow. The desirability of acquiring a lighthouse supply steamer for the Upper Lakes is also being considered.

Not merely as an aid to navigation, but by reason of its intimate relationship with the whole population of Canada, the meteorological service maintained by the Department of Marine and Fisheries is one of the most interesting institutions maintained by the Department. It dates from the year 1871.

The want of a properly organized system of meteorological observations in Canada had long been felt, both by men of science and persons interested in marine pursuits, as from meteorological data which might be obtained at different stations in the Dominion, extending over a range of several thousands of miles, properly collected, and reduced to tables and charts, much valuable information could be presented to the public relating to the laws of storms, which it was hoped might, after some experience, be made available for the purpose of indicating the approach, and giving timely warning of the impending danger to mariners and others interested, at the principal seaports of the Dominion. In England the system of giving public notice of approaching storms had previous to 1871 been carried out to a certain extent, and with considerable success, by Admiral Fitzroy, in connection with the Board of Trade, but after his death, a committee of the Royal Society in London, took the meteorological department of the Board of Trade under their charge in 1866, and a liberal grant of money—£10,000 at first—was annually made by the British Parliament for the purpose of carrying on the meteorological duties formerly undertaken by Admiral Fitzroy and for making various and extensive enquiries in connection with this interesting and important subject.

In the United States great progress had been made in the development of this great, important science, and it had become a regularly organized branch of the Public Service at Washington.

Until 1871 no organized Governmental system of taking meteorological observations and tabulating them for publication had been in operation in Canada, although there were some very able scientific men in the Dominion who not only had taken a great interest in this subject as amateurs, but had been devoting much time and attention to it, although their labors had been to a certain extent unavailable for the purpose of ascertaining general results, as local observations only become valuable when they are taken at certain times in conjunction with other stations, and subsequently tabulated and compared with similar observations at other stations throughout a large extent of country.

Some time previous to 1871, Professor Kingston, the director of the Magnetic Observatory at Toronto, a great enthusiast in the study of meteorology, and a gentleman of high scientific attainments, brought this subject prominently under the notice of the Hon. Mr. Mitchell, Minister of Marine and Fisheries, and suggested the advisability of his taking the necessary steps to obtain from the observatories under the Department, and lighthouse keepers at distant stations, such as Sable Island, Saint Paul's Island, Belle Island, Bird Rocks and other exposed places, on the seaboard, as well as at inland lighthouse stations on the lakes, a record at stated times of the state of the weather, rain, winds, etc., and to have them forwarded to him for the purpose of inaugurating a thorough system of meteorological observations, and rendering the data thus obtained useful and valuable, not only to scientific men, but to the commerce and maritime interests of the country. In order to commence the system, however, it was necessary that instruments, books of report, and forms should be procured and some extra assistance provided for, to make the calculations and tables. On the Minister's recommendation the sum of $5,000 was placed in the estimates for this service, and that amount was duly voted by Parliament, and the necessary instruments, records and forms procured and distributed to the stations recommended by Professor Kingston.

Thus was the present meteorological service established, the existing magnetic and astronomical observations becoming the basis of the new service. In 1870 the observatories maintained or aided by the Government of Canada were situated at Toronto, Kingston, Montreal, Quebec and St. John. The magnetic observatory at Toronto originally belonged to the Imperial Government, but in 1855 it was given up along with its valuable collection of instruments to the Provincial Government, and its general supervision had since been entrusted to a committee of the Senate of the University of Toronto. The observatories at Montreal and Kingston were and are attached to the universities there. The observatory at Quebec, which was designed principally

for the purpose of giving correct time to the shipping so that their chronometers could be correctly rated before proceeding to sea, was erected in 1850 and the Lords of the Admiralty nominated Commander Ashe, of the Royal Navy, in the same year as Director, to take charge of it. As it was an observatory established chiefly for marine purposes it was placed after Confederation under the supervision of the Marine Department. The Director had accumulated a good supply of instruments both for general astronomical work and for photographing purposes.

The sum of $1,500 was voted by Parliament for observatories in Nova Scotia and New Brunswick for the financial year ended June 30th, 1869, and a suitable site was thereupon selected at St. John for the erection of an observatory and time ball to give time to the large amount of shipping which was constantly leaving that port for the United Kingdom and other ports beyond seas.

The observatory was erected on the summit of Fort Howe Hill at the head of St. John Harbor, where it can be seen by all the shipping lying inside of Partridge Island. The site was obtained from the War Department, who owned the land, at a nominal rent of £1 5s. per annum.

On July 15th, 1871, the Toronto observatory was placed in connection with the "Signal Office of the War Department of the U.S.A.," for the benefit of commerce, meteorological stations have been established in the North American continent, extending from the Pacific to the Atlantic coast, and from the Gulf of Mexico to the United States boundaries.

By 1887 various additional stations for collecting climatological data had been made, the following being of the most importance: At Kingston readings for the temperature have been taken every two hours, night and day, by the non-commissioned officers of "A Battery." Reports have been received from various stations in the North-West Territories started under the superintendence of the officers and non-commissioned officers of the Mounted Police.

During the summer of 1887, and to the close of navigation, a chart of the weather, with probabilities for the ensuing twenty-four hours, had been issued by the officer at Toronto, at 10 a.m., and furnished daily, Sundays excepted, to the Marine Exchange Board for public inspection. Since October these probabilities had appeared in the Toronto papers, and later they had been furnished to the telegraph companies, and forwarded by them for publication in the various newspapers in Ontario and in Montreal. It was proposed "shortly" to extend these probabilities so as to include the Maritime Provinces. The verification of these probabilities in 1887 was as follows : In October, with two exceptions all were fully verified. In November the number of predictions issued was 130, and of these 108 were fully, 12 partly, and 10 not verified; or 92½ per cent. verified and 83 per cent. completely so. In December the number of predictions issued was 151; of these 128 were fully, 19 partly and four not verified, or 97¼ per cent. verified, and 84¼ per cent. completely so.

During the year 1904 six new stations of the Meteorological Service were established in British Columbia, eight in the North-West Territories and eleven in Manitoba. There were then 340 stations in the Dominion, Newfoundland and Bermuda using instruments supplied by the Canadian Government. At 237 stations, the observations were taken voluntarily, sending regular monthly returns to the central office. At sixty-four stations lying chiefly in the far northern territories of Canada, and at lighthouses in the Gulf of St. Lawrence, small gratuities are allowed observers. At thirty-nine stations distributed at nearly equal intervals throughout the Dominion, three or more observations are taken daily, and the observers are paid salaries. From thirty-four of these stations two reports each day are telegraphed to Toronto, to be used in the preparation of the daily weather chart. Climatological reports are published, each report containing a meteorological summary from nearly 250 stations. An annual meteorological summary is also published for Toronto, a monthly weather review for the Dominion and a monthly weather chart. Forecasts are of the greatest interest to the public, and are now issued for all parts of the Dominion, and storm signals have been hoisted at nearly every port, both on the seaboard and on the Great Lakes. While forecasts and storm warnings working on fairly established lines are given every attention, research work and investigation of magnetic changes and meteorological phenomena are steadily pursued. The forecasts and storm warnings had been maintained during 1904, and 1,305 warnings from Toronto sent, and of these 1,105 or 84.7 per cent. were verified. The storm warnings are appreciated by mariners and the forecasts of weather have been considered valuable by forwarders. The shippers of perishable goods continue to make frequent use of special forecasts given by telegraph and by telephone, and during the winter season the shippers generally consult the central office before hazarding a consignment by rail. Another work undertaken by this office is the despatch of special warnings of snow storms and drift to the various railways of the Dominion. The railway officials most certainly appreciate the endeavors to render service and are saved time and money by being forewarned.

So as to systematize and facilitate the work in connection with the hydrographic surveys, for many years performed by this Department, the administration of this branch of the public service was assigned to the department, under the provisions of 55-56 Vic., Chap. 17, and an Order-in-Council was passed on July 23rd, 1904, transferring the hydrographic work of the Departments of Public Works and of Railways and Canals to the Department of Marine and Fisheries, so

that that Department alone be charged in future with the management and control of such surveys.

The following few tables, compiled from the very latest figures, convey an excellent idea of the tremendous efforts at present being put forth to increase the safety of Canadian water routes, and of what has been already actually accomplished in that direction:

Comparison of the total number of lights in the Dominion in the years 1896 and 1905.

	1896.	1905. Including Pole Lights.
Light Stations	616	1036
Light Ships	13	16
Pole Lights	136	..
	765	1052

Expenditure for Lighthouse and Coast Service for 1896-1905.

	1896.	1905.
Salaries and allowances of lightkeepers	$199,348 61	$237,919 71
Maintenance and repairs to lights	225,691 07	674,264 37
Construction of lights	17,622 28	1,447,202 77
" Lake St. Peter	.....	93,938 90
Agencies, rents and contingencies	15,372 14	24,825 66
Signal service	5,338 76	8,755 44
Repairs to wharves	2,644 69	1,590 61
Salaries of temporary officials	.....	15,881 35
Total	$466,057 55	$2,504,378 81

Additional aids to navigation on the St. Lawrence since 1896.

	Below Quebec.	Quebec to Montreal.	Montreal to Kingston.
Wireless telegraph stations	13	..	..
Submarine signal stations	4	..	..
New light houses and pole lights	12	51	11
New lightships	1	..	..
New fog-signal stations	8	..	..
Old fog-signal sta's refitted	10	..	..
Spar buoys	1	27	..
Steel conical buoys	2	14	..
Steel can buoys	2	23	..
Steel gas buoys	10	39	31

The following table shows the number of new lights established in each district since 1896.

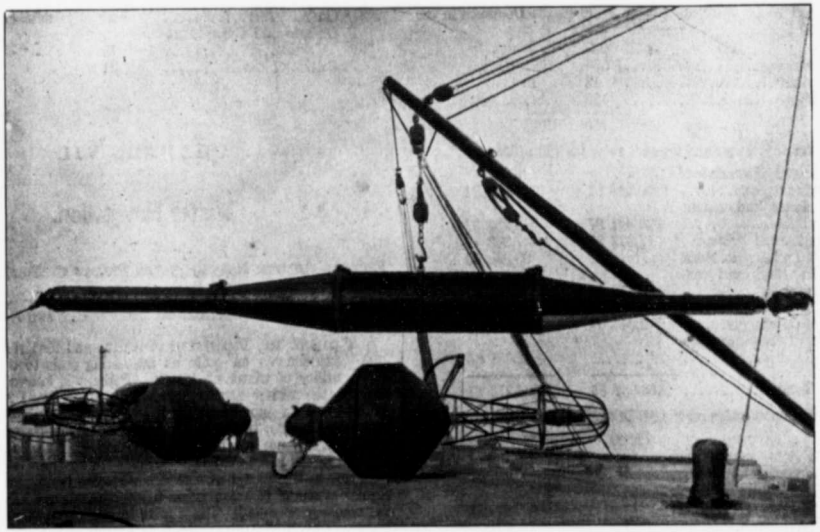
	Light Houses.	Pole Lights.
New Brunswick	23	Included in number of light-houses.
Nova Scotia	58	
Prince Edward Island	15	
Quebec	82	
Ontario and above Montreal	75	
British Columbia	31	

CHAPTER VII.

Winter Navigation.

Fighting Against Nature in the Straits of Northumberland—Interesting Experiments Inaugurated in the St. Lawrence—Expeditions to Hudson Bay and Northward.

At present the Department of Marine and Fisheries is engaged in experiments on quite an interesting scale to demonstrate the utility of winter navigation. Perhaps it is scarcely correct to describe the winter service between Prince Edward Island and the mainland as an experiment, as it is a comparatively long-established steamship service; but it is experimental to this extent, that perfect regularity has not yet been accomplished, and the people of Prince Edward Island insist that their peculiar winter transportation problem shall not be considered as settled until there is an absolutely reliable regular means of communication between the Island and the mainland the whole year round. The efforts to prolong navigation in the St. Lawrence by ice-breakers is in a purely experimental stage. The expeditions to the Hudson Bay and northward are really experimentally interesting as likely to demonstrate the practicability of summer navigation in Canada's northern waters, and may be fairly considered in connection with the winter navigation experiments, as the conditions to be met with and the obstacles to be overcome are approximately the same.



SEA AND ICE GAS BUOYS

When in 1873 Prince Edward Island entered Confederation, one of the provisions of the agreement was that efficient steam communication would be provided by the Dominion for the conveyance of mails and passengers from the island to the mainland and back, at all times, winter and summer.

For about two years, a slight, and perfectly inadequate attempt was made to keep up winter communication between the Island and the mainland by a small steamer called the "Albert." She was a light-powered and quite unsuitable vessel, and was quite unable to cope with the conditions existing in the Straits of Northumberland, in winter, when the ice packs and jams to a depth of fifteen to twenty feet. After a couple of years all thoughts of overcoming the obstacles opposed by nature to the service, with such a steamer, were abandoned, and there intervened two years more before winter navigation in the Straits was attempted.

In April, 1876, a contract was entered into by the Marine and Fisheries Department, with Mr. E. W. Sewell, shipbuilder, Levis, Quebec, for the construction of a suitable steamer to maintain communication during the winter between Prince Edward Island and the mainland, for the sum of $50,000. This vessel, called the "Northern Light," Canada's first ice-breaker, was built at Levis during the following summer season, was fitted out for the proposed service, and despatched on December 4th to Charlottetown. The vessel was built of tamarack, rock elm, green heart and white pine, under the special survey of English Lloyds to Class A for ten years. She was to be high-powered, and was also fitted as an efficient tow-boat to render assistance and towage to stranded or ice-bound vessels during the fall or closing of navigation in the Gulf of St. Lawrence. Her dimensions were as follows : Length, 144 feet; extreme breadth, 25 feet; depth of hold, 16 feet; gross tonnage, 393 tons; registered tonnage, 267 tons. Her engines, which were compound surface-condensing 120 horse-power, were made at Levis by Messrs. Carrier, Laine & Co.

The "Northern Light" proved of some utility, making many trips across the Straits of Northumberland, between Pictou and Georgetown, when any ordinarily built vessel would have been unable to force her way through the ice; but she was quite incapable of surmounting the obstacles to navigation in mid-winter. In the winters of 1877, 1878 and 1879 there were large gaps of months when the "Northern Light" could not run at all. She made daily trips till January 15th of the last-named year, when, owing to the packing of the ice in the straits, she was unable to reach Pictou, and could only make trips occasionally. An effort was made to keep up communication by sending the vessel to Wallace Harbor, and an attempt was made on February 6th to reach that place but it proved unsuccessful, and the vessel returned to Georgetown on February 11th. On February 13th trips to Pictou were resumed, but on the 23rd of that month the vessel got into very heavy ice, and, in working her way out, broke the outer bearing of the shaft, which disabled her for any further service that season.

The earnings of the "Northern Light" during the short period she ran in 1879 amounted to $1,035.25, which did not include anything for carrying the mails; and the cost of repairs and improvements, together with running expenses for the fiscal year ended June 30th, 1879, amounted to $16,333.05.

In 1880 there was a whole month, from March 10th to April 10th, when the "Northern Light" never crossed. The following winter (1881) she ran regularly until January 21st, when she was caught in the ice and did not get back to Georgetown till February 14th. She was then laid up till March 8th, when an attempt was made to break her way out, but she did not get clear till March 25th, from which time until April 18th she made three round trips per week. On April 18th she resumed daily trips and continued to do so until April 29th when the ordinary summer steamers commenced running.

The earnings of the "Northern Light" during this winter season amounted to $5,849.92; and the cost of repairs and running expenses for the fiscal year ended June 30th, 1881, amounted to $15,139.95.

In 1882 the "Northern Light" was unable to run from February 4th, until March 28th.

And so things continued, in spite of the protests of the people of Prince Edward Island that the Government of Canada was not doing its best to carry out the solemn compact made with the province in 1873. Dissatisfaction became so acute that the Provincial Government laid the matter before the Imperial Government, alleging claims for breach of contract against the Dominion Government amounting to $5,000,000. The British Government declined to take any action in the matter beyond referring it to the Dominion Government.

During the winter of 1887 an effort was made to afford the people of Prince Edward relief by supplementing the "Northern Light" with other steamers, the idea being that the additional movement of vessels would prevent the ice packing. The "Northern Light" commenced service on December 21st, 1886, and made twenty-one round trips between Charlottetown and Pictou and Georgetown and Pictou until February 4th, when she was forced by the ice to lay up at Souris. On April 6th she resumed her trips between Georgetown and Pictou and continued till May 5th, making seventeen additional round trips. The earnings of this vessel during the year amounted to $4,951.30.

The steamer "Neptune," a Newfoundland sealer, was chartered by the Department to assist the "Northern Light" in maintaining winter communication with the mainland, and made nineteen round trips

between December 11th and February 4th, 1887, when owing to the condition of the ice, it was found necessary to withdraw her from the service. The sum of $13,187.98 was paid the owners of the "Neptune" for the services of the vessel, and her earnings amounted to $1,250.99.

The Dominion Government steamer "Lansdowne" was also engaged for a short period this year in the winter service between Prince Edward Island and the mainland, but having been found unsuitable, was withdrawn. At the end of the winter of 1887-88 the "Northern Light" was declared to be too badly strained to undertake further winter service.

Upon receiving this report the Government had a powerful, suitable, special ice-breaking steamer built for the service, and in the early part of the following winter the "Stanley" was placed on the route and still continues in commission, doing very good service, but being occasionally compelled to abandon the route during the most rigorous winters. In 1900 a second steamer of the same class, but even more powerful, the "Minto," was also placed upon the route, but even with two steamers engaged in the service, the communication is occasionally interrupted, although much less frequently than previously. Besides the old route between Georgetown and Pictou, an experiment has been made with an alternate route between Summerside, P.E.I., and Cape Tormentine. The distance between Summerside and Cape Tormentine is only fifteen miles, and while there was a winter boat on the line there for one winter, that of 1902, it did very excellent service. The "Stanley" made her first trip on this alternate route on January 3rd, 1902. In twenty-five working days for January she made sixteen round trips and two half trips. In twenty-four working days for February she made ten round trips and five half trips. Twenty-six working days for January she made sixteen round trips and two half trips. In twenty-four days for February she made ten round trips and five half trips. Twenty-six days for March she made twenty-one trips and four half trips. In a total of seventy-five working days, she made forty-seven round trips and eleven half trips. Thus she made 105 half trips, or the kind of trip usually made by the other steamer during winter on the Pictou-Georgetown line, or an average of nearly one and a half trips per day during the whole seventy-five working days.

During the season of 1903, an attempt was again made to have continuous winter communication between Summerside, P.E.I., and Tormentine, N.B., the steamer "Stanley" being placed upon the route on December 16th, and making return trips until the 28th. On that day, however, the ice became very heavy and so badly rafted in Summerside bay that it was impossible to keep up communication any longer on this route. The "Stanley" then entered upon the winter service between Georgetown, P.E.I., and Pictou, N.S., in conjunction with the Dominion Government Steamer "Minto," continuing on that route, until April 20th, when she made one trip to Charlottetown.

The "Minto" commenced the winter mail service on December 19th, 1903, making tri-weekly trips between Charlottetown and Pictou until December 26th, when that route was abandoned and the Pictou-Georgetown route entered upon, continuing thereon until April 12th, 1904, and making tri-weekly trips with the Dominion Government Steamer "Stanley." The "Minto" then returned to the Charlottetown-Pictou route until April 23rd, when the Charlottetown Steam Navigation Company's steamer took up the service and the "Minto" was laid up. In mid-winter the work of the steamers is supplemented by the ice boat service between Cape Traverse on the Island and Cape Tormentine on the New Brunswick shore, a distance of about nine miles. The standard ice boat is about eighteen feet long, five feet wide and two feet two inches deep. Its frame is oaken, it is planked with cedar, and the planks are covered with tin. It has a double keel which serves for runners, and four leather straps are attached to each side. The crews are hardy, powerful and courageous men. The passage usually occupies three and a half hours, but when there is much "lolly" (small particles of ice floating in the water often to the depth of several feet), and when wind and tide are unfavorable, it sometimes requires from five to seven hours.

These small ice-boats are quite incapable of performing the complete duties of this service. During the winter of 1905, a very severe season in the Maritime Provinces and the Atlantic States, the steam service was interrupted from January 27th until late in March. As a result there was a tremendous accumulation of mail and express matter at the continental ports on the Straits of Northumberland. There were on March 6th between two and three thousand bags of mail matter at Cape Tormentine and Pictou. Between that date and March 15th, an attempt was made to take this mail matter across to the island, and its bulk was reduced by something like 1,000 bags, but on March 18th there were still 800 to 1,000 bags of mail at Pictou. Papers and samples of goods had been accumulating there since January 27th, also there was 185 bags at Tormentine.

Notwithstanding this unfortunate interruption it is admitted that since the year 1900, when the second modern ice-breaker was put on the route, the Government has been seriously trying to perform its part of the contract with Prince Edward Island, namely to provide a "continuous efficient steam service for the conveyance of mails and passengers to be established and maintained between the Island and the mainland, winter and summer."

That this had not been the case before 1900 was admitted by the Dominion Parliament itself, when during the session of 1901, a bill, introduced by the Hon. Mr. Fielding, for the Government, was adopted,

providing that from and after January 1st, 1901, there should be paid to the Province of Prince Edward Island, in addition to all sums up to then authorized by law, an annual allowance of $30,000, on account of the alleged non-fulfillment of the terms of union between the Dominion and the said province as respects the maintenance of efficient steam communication between the island and the mainland.

During the winter of 1905 a series of most interesting experiments was inaugurated to ascertain how the season of navigation in the St. Lawrence could be prolonged spring and autumn and to establish how far winter navigation could be conducted in the Lower St. Lawrence and the gulf.

It is a well-established fact that the formation of a jam or ice bridge at Cap Rouge particularly, but also at one or two other points to a less extent, causes the St. Lawrence above Quebec to be unnavigable some weeks earlier each winter than would be the case did these blockades not occur. Similarly, in the spring, these jams hold back the ice for some weeks when the river would otherwise be open to navigation. In view of what has been accomplished by ice-breakers of the most powerful class in Russia, the Straits of Mackinac, and elsewhere, many merchants and others interested in the navigation of the St. Lawrence have for long been urging that it was worth while to spend money to ascertain if it would not be possible, with the aid of ice-breaking vessels, to prevent the formation of the ice-bridges so early in November and December, and to facilitate the breaking up of the ice in the spring. It was urged that this last object could be accomplished by keeping the ice about Cap Rouge narrows broken up during the winter. There are even those sanguine enough to predict that with the judicious use of specially-built vessels the winter navigation of the St. Lawrence as far as Quebec, and even as far as Montreal, may yet be accomplished.

The present Minister of Marine and Fisheries is one of those who has for some time thought it was well worth while to ascertain how far modern ice-breakers may be made useful in prolonging the season of practicable navigation on the St. Lawrence, and in establishing winter navigation in the Lower St. Lawrence and gulf.

In 1904-05 two ice-breakers were built to the order of the Department of Marine and Fisheries by Messrs. Fleming and Ferguson of Paisley, Scotland. The "Champlain," one of the two, is a small vessel, and her work is principally confined to keeping navigation open between River Ouelle and the north shore of the St. Lawrence both winter and summer. The "Montcalm" is a very powerful and large ice-breaker. She is also intended to act as a lighthouse and buoy ship during the summer season. Her principal duties are to endeavor to keep the ice-bridge from forming at Cap Rouge, River St. Lawrence. Both are steel steamers, propelled with screws. The specifications of the "Montcalm" are length over all 252 feet; breadth outside 40.65 feet; depth, bottom of keel to top of deck 19.05 feet; displacement 2,130 tons; two sets of triple expansion engines, speed 13½ knots, with four Babcock & Wilcox Water tube boilers; gross tonnage, 1,432 tons, indicated horse-power 3,600. Her cost was $300,000.

The "Champlain" length over all 132 feet; breadth outside, 30 feet 3 inches; depth from top of deck to bottom of keel 11 feet 3 inches; displacement 550 tons; indicated horse-power 850; her speed at trial 10½ knots; she is fitted with one simple compound, surface condensing engine, and one multitubular Scotch boiler.

The experience of both vessels during their first season afford reason to hope that the experiment will result in a considerable measure of success.

Mr. P. W. St. George, the well-known and capable Montreal engineer had an opportunity of seeing the "Montcalm" at work during the hardest part of the winter of 1905. As a result he reported as follows to the Minister :

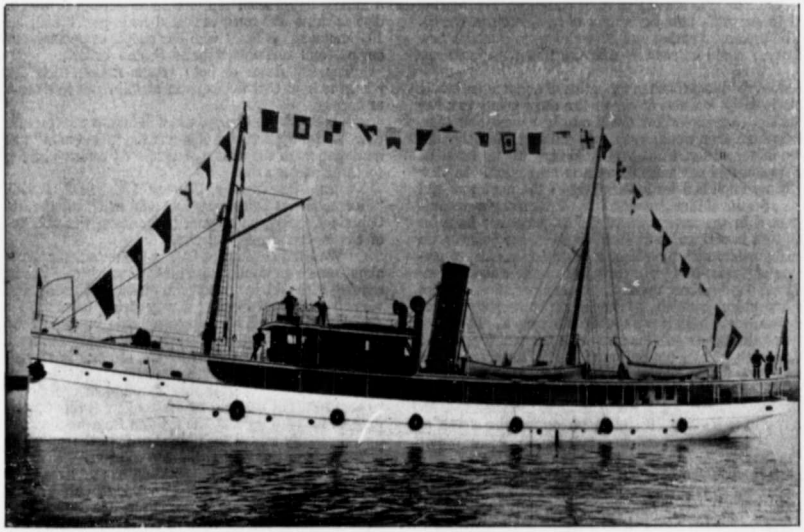
"Sir,—On Tuesday, January 17th, 1905, I visited the steamer "Montcalm" at Quebec at 6.30 a.m. and with the kind permission of Captain Koening, under your instructions, was able to see the working of the ice-breaker "Montcalm.'

"We left the wharf at 6.30 in the morning, going up to Cap Rouge about one-quarter mile above the Quebec bridge. The ice was very thick, ranging I should judge between fifteen and twenty feet thick, piled up very strongly and forming a very strong barrier. The way in which the captain handled his ship on approaching the ice was very masterly as he did not overstrain his ship in charging the ice too directly.

"The work being done by the steamer is marvelous, considering the immense thickness of the ice and the enormous power to contend against. I feel confident that the captain is doing all in his power to break the ice, and will by constant work this winter, if nothing happens to his ship prevent the ice jam from forming in the spring. By breaking daily up the ice which has formed very strongly since the ice began to form this winter, the ship will be able to hold her own. Work can only be done during the ebb tide, so that a small portion of the day can be used. If I may suggest anything I would recommend that after this season, that another steamer be used in conjunction with the 'Montcalm' so that two steamers would work jointly together, one either side of the channel, which would more than double the work.

"As to the steamer herself, she is a beauty in strength and beauty combined.

"I remain, Sir,
Your obedient servant,
"(Signed) Percival W. St. George."



HYDROGRAPHIC SURVEYING STEAMER "BAYFIELD"

Besides the actual work of ice-breaking, the "Montcalm" is intended as a sort of early and late-season patrol, being sent down to Belle Isle in early spring, and held available at a moment's notice in the early part of winter, to assist any vessels which might chance to be embarrassed by the ice. The security thus afforded to early and late vessels is alone expected to result in an extension of the seasons of navigation, as, alarmed by past disasters, before there was any ice breaker to release ice-bound vessels, shipping has been taken off the route earlier in the winter than was generally necessary, and the river channel is often open for many days each spring before the inauguration of the season's shipping operations.

That these efforts of the Department to make the St. Lawrence route as safe as it could be made, not only during the recognized shipping season, but as early and as late as possible in the season is appreciated by the shipping community is proved by a resolution passed at a meeting of the Shipping Confederation of Canada held at Montreal, December 27th, 1904. This resolution read as follows:—

"Be it resolved, whereas the present year is drawing to a close, the members of this federation unanimously desire to record a vote of thanks to the government for the many improvements and aids to navigation, which have resulted in the lowering of insurance rates, and may lead to further advantages in this direction, when the entire system of improvements are completed.

"Be it further resolved, that it is gratifying to the public at large, as well as the federation, to know that there is some prospect of navigation being prolonged, and it is to be hoped that the enterprise of the government, in providing two ice-breakers, will meet with the success it so well deserves. It is to the credit of the Minister of Marine that the latest methods and devices have been tried, as by extending the period of navigation even for a few weeks will be a national benefit, besides instilling hope in the breast of all Canadians that the day may not be far distant when the St. Lawrence waterway will be open to navigation during the entire year.

"And be it further resolved, that the president sign a copy of this resolution which is to be forwarded to the Premier, Sir Wilfrid Laurier, and the Minister of Marine and Fisheries, the Honourable Raymond Prefontaine.

(Sgd.) HUGH A. ALLAN,

"PRESIDENT."

In 1884 the Dominion Government despatched an expedition to Arctic waters in the chartered sealer "Neptune," under command of Lieut. A. R. Gordon, R.N., commanding the Fishery Protection Service, to roughly explore the outlying lands to the far north of the Dominion of Canada, to make some test of the practicability of navigation in Hudson's Straits, and to establish some observation posts.

In 1885 the Department secured from the Admiralty H.M.S. "Alert," which had been specially rebuilt for the Arctic expedition of Sir George Nares in 1876, and she was placed in command of Lieut. Gordon, R.N., for another voyage to the north.

The "Alert" was a screw steamship, barque-rigged, of about 700 gross tons, and was so constructed as to be capable of resisting great ice pressure, and her engines being only fifty horse-power nominal, the screw was small, and struck, when the ship was at her load line, several feet below the water, so that in every way she was well adapted for the work of the expedition.

On May 27th, the "Alert" sailed from Halifax, leaving the harbor in company with the Dominion steamship "Lansdowne."

The following were the names and positions held by members of the expedition and officers of the ship:—Officers of the ship, Andrew Robertson Gordon, commanding Dominion steamship "Alert," Hudson's Bay Expedition; John James Barrie, first officer; Edward Watts, second officer; David Mooney, chief engineer; J. E. Esdaile, second engineer; W. F. Yeadon, carpenter.

The members of the expedition were:—Dr. E. Bell, F.R.S.C., medical officer, geologist, etc.; Mr. James McNaughton, assistant geologist; Mr. Frank F. Payne, Mr. James Tyrell, Mr. John McKenzie, Mr. Percy Woodworth, and Mr. Gilbert Shaw, observers.

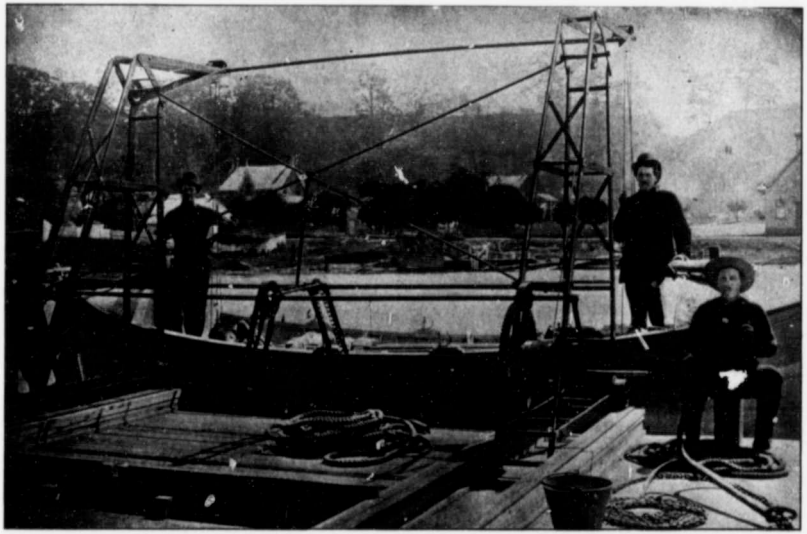
Besides the above mentioned, Mr. D. G. Beaton, editor of the *Winnipeg Times*, accompanied the expedition as the representative of the company, who were interested in the constructions of the railway from Winnipeg to Hudson's Bay, making a total of fifty-two persons in all on board at date of sailing.

The expedition returned safely to Halifax, October 18th, 1885, bringing back the station observers left in the far north the previous year.

In his report to the Minister on the expedition Lieutenant Gordon wrote:—

"Apart altogether from the question of the navigability of the Straits as a practicable commercial route for the transport of produce from the Northwest Territories of Canada, the resources of the Bay and Straits are well worthy of attention, and will, in my opinion, amply repay those who undertake their development. In my report of last year I drew attention to the fact, that the whole of the fishing and trading done in the Hudson's Bay region is at present in the hands of the Hudson's Bay Company and the New England whalers.

"The salmon and trout fisheries continue to be prosecuted by the Hudson's Bay Company; their refrigerator vessel, the 'Diana,' taking



DOMINION GOVERNMENT LIFE-BOAT STATION AT PORT STANLEY, ONT.—LIFE-BOAT HOISTING GEAR

home this year upwards of thirty tons of fresh salmon and several tons of trout. The Company have evidently in view the development of this branch of their trade, inasmuch as they have this year brought out a small vessel, of some twenty tons, to carry on the coasting trade between their stations in Ungava Bay.

"The mineral resources of the Bay, as well as the natural history, have been treated of by Dr. Bell, who has both years accompanied the expedition as medical officer and geologist, and who had also, on previous years, visited both the east and west coasts of the Bay. Dr. Bell's report shows the extent of these resources, and if any railway communication were established with any part of the Bay, it would be possible to prosecute the whale fishery, porpoise fishing, salmon fishing, and walrus hunting much more advantageously than can at present be done. Suitable vessels, such as strongly built schooners, could winter in the Bay, and the crews be sent up in the spring of each year.

"Every United States whaler which goes into Hudson's Bay is also an unlicensed trader, competing with the Hudson's Bay Company for the trade with the Esquimaux, the Company paying full duty on all articles imported for trade, whilst their competitors from New England take, duty free, goods from bonded stores or goods manufactured in the United States as best suits their business."

During 1886 the "Alert," again under Lieutenant Gordon, made another trip to northern waters. The instructions issued to the commander of the expedition by the Hon. George E. Foster, Minister of Marine and Fisheries, dated at Ottawa, June 22nd, 1886, included the following:—

"It is desirable that you should proceed to the mouth of the Hudson's Straits with as little delay as possible, so as to avail yourself of the very best feasible opportunity to make the passage through. If you are prevented from at once entering the Straits, you will occupy your time in taking accurate observations of the extent and condition of the ice, the prevailing winds and currents at its mouth. At the earliest possible period, consistent with the safety of the expedition, you will push through the Straits in order to demonstrate the earliest date of the opening of navigation, and the time required to pass through the ice. * * * *

"After having made your way through the Straits and taking all necessary observations, it will be advisable for you, to push forward to the western coast of the bay, employing the time at your disposal, with carefully examining Churchill Harbour and the mouth of the Nelson River, taking all necessary soundings, and observing the lead of the river up to Seal Island, with a view to ascertaining the suitability of those harbors for the reception and security of vessels and the purposes of trade.

"In addition to this, any information, hydrographical, geological or with reference to the fisheries of that region which you can gather, should be as carefully and completely collected as opportunity permits.

"It would be well to delay your homeward voyage through the Straits to as late a period as is consistent with safety and the labor involved in gathering the men and plant of the observing stations, in order to gain whatever data you can as to the conditions of the Straits at the latest period of navigation. * * * *

"You will bear in mind that it is the wish of the department to demonstrate as far as possible the navigability of the Straits for purposes of commerce, in point of time and facility." * * * *

Captain Markham, R.N., accompanied this expedition as the representative of the Winnipeg and Hudson's Bay Railway Company.

Lieutenant Gordon, in his report on this expedition, wrote:—

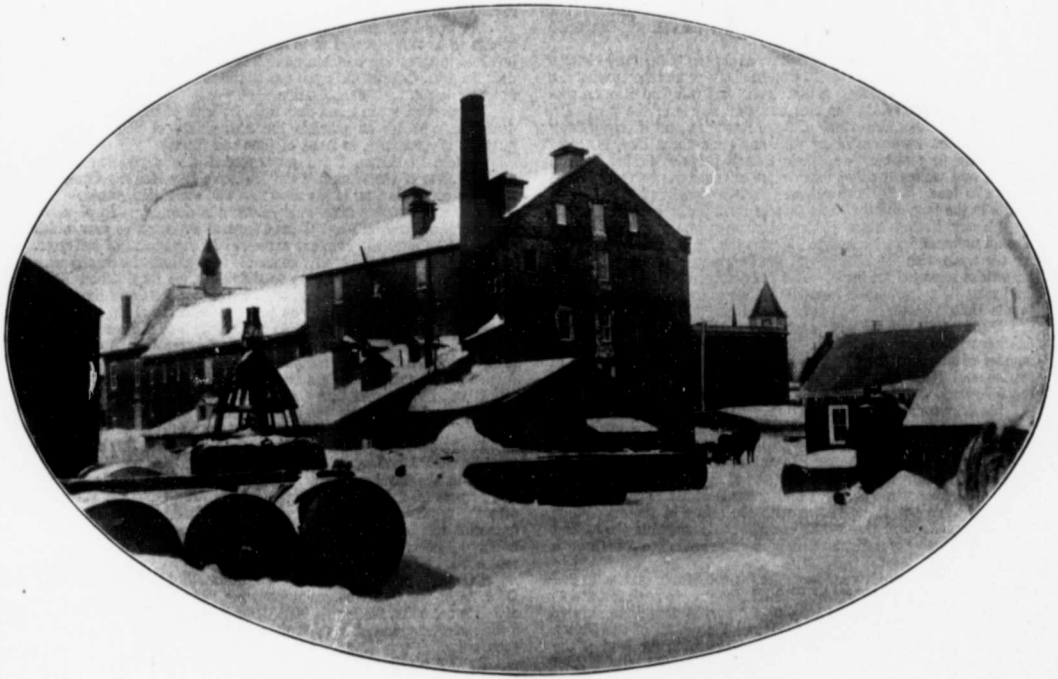
"In regard to the main question for the determination of which the expedition was sent out, I have learned nothing this year which causes me to alter the opinions expressed in my report of last year. For the purposes of practical commercial navigation, the Straits were certainly not open this year up to July 20th, so that although the Labrador ice passed away a month earler than last year, and the harbor ice in Hudson's Straits also went out much earlier, I do not think there would be any great difference in the length of the season, therefore we may say that the months for navigation are July, August, September and October with delays in July and difficulties in October. August and September are the two clear months."

It will be observed that the main object of these Hudson's Bay expeditions of the eighties was to ascertain the practicability of establishing a commercial route to the far west by northern waters.

The Dominion Government's expeditions to Hudson Bay and northward since 1903, and extending up to the present time, mark a new departure in the development of Canada, being undertaken largely for the purpose of displaying the flag, and asserting Canadian authority over the northern coasts and islands. Incidentally much scientific information has been obtained as to the natural resources of the most northern portion of Canada, and as to the practicability of commercial routes via Hudson Bay.

To provide for the first of these expeditions, the Marine and Fisheries Department chartered the sealing steamer "Neptune" from the firm of Job Bros. & Co., St. John's, Nfld. She is the largest and best of the sealing steamers, and although built in 1876, has always been kept in good order.

By Order-in-Council of August 13th, 1903, Mr. A. P. Low of the Geological Survey, Ottawa, was appointed to be officer in charge of the expedition via the "Neptune," and she sailed from Halifax, August



DOMINION LIGHTHOUSE DEPOT AT PRESCOTT, ONT., IN WINTER

23rd, 1903. They first touched at Nachback, on the Labrador coast, thence to Cumberland Gulf and Baffin's Land. They spent the winter north of Chesterfield Inlet, and made a number of sledge expeditions of investigation. The expedition returned to Halifax, October 11th, 1904, having been absent a year and 51 days.

The "Neptune," from Halifax until her return to that port, steamed 10,000 miles. Of this 9,100 miles was through water, and 900 miles through heavy ice. The distance steamed through ice is at least twice that of the course, owing to the number of turns and twists required to work through the ice. In consequence the actual ice-mileage should be given as 1,800 miles; and the total 10,900 miles. This is probably the greatest ice-mileage ever made in one season by any ship. The following surveys were made :

Log and compass surveys of coast-line, checked by astronomical observations; previously unsurveyed, or roughly sketched-in by sailing vessels, 1,175 miles.

Numerous astronomical observations, for the position of Fullerton, and accurate chain and micrometer surveys of the harbor and environments of Fullerton, ninety-one miles.

Four hundred and thirty-three soundings, taken through six feet of ice, in the harbor and approach to Fullerton.

During the time that the "Neptune" was at winter quarters at Fullerton, the western coast of Hudson Bay was geologically examined, from the head of Chesterfield Inlet to the head of Wager Inlet, and track surveys made of that distance, 610 miles.

While the "Neptune" was fast in winter quarters, a boat trip was made to Southamption island, and a track survey and geological examination made a part of its western shore, seventy miles.

During the absence of the "Neptune" to the northward, a boat survey of the east side of Ungava Bay, resulted in the geological examination of ninety-five miles.

Total mileage of surveys, 2,041 miles.

Besides the work mentioned above, geological examinations were made at every place touched at by the "Neptune"; and a considerable amount of information was obtained about the rocks and glaciers of the north.

Large collections of rocks and fossils were made.

The diseases of the natives were studied and reported upon. A census of all the natives of Baffin Island, the southern side of Hudson Strait and the western side of Hudson Bay was made.

A number of skins and skeletons of the northern animals, including a group of six musk oxen, were prepared for museum purposes.

Several fishes of the northern seas and fresh waters were obtained, and specimens preserved in formaline.

The use of the dredge, secured important collections of marine invertebrates; while those of the ponds were taken in nets.

A fine collection of Arctic plants was made at the several places called at, and a number of interesting insect specimens secured at the same time.

A great amount of information concerning the habits and distribution of the important animals including the whales and seals was obtained at all places visited.

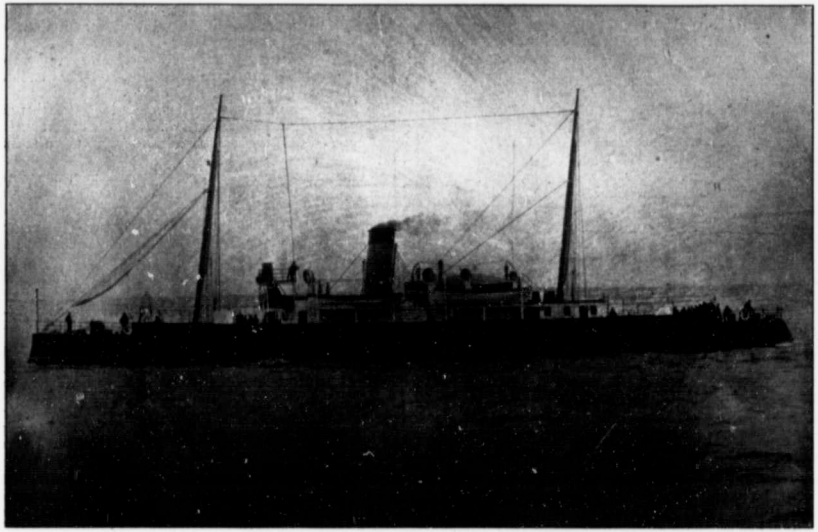
Weather observations, including readings of thermometers, barometer, rain and wind gauges, were taken daily throughout the voyage. During the winter months observations were taken at intervals of four hours.

An interesting series of weekly measurements were made of the thickness of the ice in the harbor.

While in the ice, continuous notes were kept of the character, thickness, extent, and kind of ice met with. These observations are particularly important in regard to the coming commercial navigation of Hudson Bay and Strait.

In connection with this question all the information possible was collected concerning the tides and currents of these waters, and also of the ice-laden currents of Baffin Bay and Davis Strait.

In July, 1904, the Government decided to send another expedition to Hudson Straits and north thereof, and for this purpose the German Antarctic steamer "Gauss" was purchased, and renamed the "Arctic." This vessel with a detachment of Royal North-West Mounted Police on board, under the command of Superintendent Moodie, officer in charge of the expedition, and with Captain Bernier as Sailing Master, left Quebec in September, 1904, met the "Neptune" on her return voyage at Port Burwell, and proceeded through the Hudson Straits and wintered at Fullerton, on the south shore of Baffin's land. The Government having decided to investigate, thoroughly explore, and establish police stations in these far northern parts of Canada, it was decided to again charter the "Neptune" which proceeded north last summer, (1905) relieving the "Arctic," which is being refitted at the ship-yard of the Department with the object of proceeding to the far north again in 1906.



CANADIAN ARMED CRUISER "CANADA"

SPEED, TWENTY-TWO MILES AN HOUR; ARMAMENT, FOUR AUTOMATIC QUICK-FIRING GUNS

CHAPTER VIII.

The Dominion Government Fleet.

History and Description of the Nucleus of the Canadian Navy —The Origin and Development of the Fisheries Protection Service—Marine Schools.—The Officers and Men Who Serve Under the Blue Ensign and Pennant.

ALL vessels belonging to the Department of Marine and Fisheries, and, in fact, all Dominion Government vessels, by specially accorded right, fly the blue ensign, the distinguishing flag of the Royal Navy Reserve, with the addition of the badge of the Dominion in the centre of the fly. In addition to the Blue ensign of Canada, the armed cruisers of Canada have the privilege of flying the Long Blue Pennant from the main truck. Such Canadian yacht clubs as have been officially granted the privilege of using the designation "Royal" such as the Royal Canadian Yacht Club of Toronto, and the Royal St. Lawrence Yacht Club, Montreal, also have the privilege to fly the blue ensign, but not the blue pennant.

In 1865 when Colonial navies were first established, the vessels of war maintained by the local governments were authorized to use the blue ensign with the seal or badge of the colony in the centre of the fly. (Colonial Defences Act, 28 Victoria, Chap. 14.)

When the question of the flags to be used in the Dominion came up, shortly after Confederation, a doubt rose as to whether the vessels belonging to the Marine and Fisheries Department could fly the blue ensign as they were not war vessels.

On September 14th, 1869, Earl Granville addressed His Excellency the Governor-General on the subject of flags for the Governors of British Colonies, and enclosed an order of Her Majesty in Council approving a memorial of the Lords of the Admiralty with reference to the flags to be used by the different branches of Her Majesty's service. In that memorial it was recommended that the flag to be used by the Governor of a Colony should be the Union Jack with the arms or badge of the Colony emblazoned on the centre thereof. Her Majesty's Secretary of State also requested that he might be furnished with a drawing of the badge with which it was proposed to distinguish the flag of the Dominion.

On these papers being referred to the Minister of Marine and Fisheries by Council, he recommended that the badge for the Governor-General to be emblazoned on a shield in the centre of the Union Jack should be the arms of the Dominion of Canada, which were simply the arms of each of the then four Provinces, combined in one shield, the shield to be surrounded with a garland or wreath of maple leaves surmounted by a crown resting on the wreath; and for the Lieutenant-Governors of each of the four Provinces, the Union Jack with the arms of the respective Provinces on a shield in the centre, surrounded by a wreath of maple leaves. Drawings of these proposed flags were duly furnished for the information of Her Majesty's Government.

The Minister took the precaution to advise, in addition, that the flag to be used by the vessels belonging to the Dominion Government should be the blue ensign, with the arms of the Dominion on the fly thereof.

These recommendations were approved by His Excellency in Council, forwarded to England and adopted, and as a result, on the fishery protection cruisers of Canada, and all other vessels which were owned by the Dominion Government, the blue ensign was carried, with the arms of Canada on the fly. (Marine Report for 1870.)

The national escutcheon on the Canadian flag being subject to enlargement and rearrangement as each new province entered Confederation, the Canadian ensign which has obtained for the past twenty-five years does not by any means answer the description of the original one as submitted to the Imperial Goverment by the Hon. Peter Mitchell, and the regularity of the existing flag was for long questioned on that account. A question was also raised as to the regularity of the procedure by which the original authorization of the Canadian blue ensign was obtained. All questions of this kind were set at rest, when, on February 2nd, 1892, at the suggestion of the Department of Marine and Fisheries, an Admiralty Warrant was issued, not only granting to Dominion Government vessels the right to fly the blue ensign of Canada, but also officially recognizing and authorizing the Canadian red ensign.

As a matter of fact the Dominion Government vessels flew the blue Canadian ensign many years before a distinctive Canadian ensign was allotted to the mercantile marine of the Dominion.

According to the "Merchant Shipping (Colors) Act," 1889, the right of wearing together with the red ensign, an additional flag on which might be shown the distinguishing badge of their colony, was accorded to colonial merchant shipping. Canada had adopted no special colonial flag, and as her merchant ships flew the plain red ensign, they could not be recognized amidst those of the Mother Country. In 1892, to meet this requirement, the Lords Commissioners of the Admiralty, on the suggestion of the Canadian Department of Marine and

Fisheries, in the warrant of February 2nd that year, permitted the badge of the arms of Canada to be inserted in the fly of the red ensign, as well as in the blue, and this new combined red ensign was empowered to be used by all citizens of Canada.

The armed cruisers of Canada have flown the long blue pennant ever since taking over the full charge of the fishery protection service from the Royal Navy. Long pennants, or pendants (also known as "mast-head pendants" and "mast-head pennants"), were introduced into the Royal Navy after the historical defeats of the Dutch squadrons to signalize the whipping administered to Britain's great naval enemy, and as a species of retort to the Dutch Admiral Van Tromp, who in the days of temporary success, had boastfully had brooms hoisted at the mast heads of his ships in token of his determination and supposed ability to sweep the British fleets off the seas. The long pennant, has since been adopted by the United States and other foreign navies. In the Royal Navy at present, white mast-head pennants, with the St. George's Cross at the head, are worn by all of His Majesty's ships in Commission, when not distinguished by a flag officer's flag, or by a Broad Pennant. They vary in length from 9 to 60 feet, in width from 2½ to 4 inches. The Long Blue Pennant, which is of similar dimensions, is white only at the head, where the St. George's Cross is shown as in the white pennant, the remaining length or fly being all blue. The Long Blue Pennant is regarded as so important a distinguishing mark of Canada's Armed Cruisers, that any seizure of a vessel effected by a Cruiser not flying the Blue Pennant is not considered to be regular.

Ever since the Department has existed it has owned and maintained a fleet of vessels for departmental work in connection with the lighthouse, the buoy, the fisheries and the surveying services, etc. The strength of this originally small fleet has gradually increased as vessels were acquired for special purposes—the maintenance of winter navigation in ice-infested waters for instance. The vessels now comprised in the fleet flying the Canadian blue ensign are as follows: "Canada," "Vigilant," "Montcalm," "Arctic," "Champlain," "Lady Laurier," "Lansdowne," "Minto," "Petrel," "Druid," "Constance," "Kingfisher," "Stanley," "Brant," "Kestrel," "Quadra," "Scout," "Gulmore," "Bayfield," "La Canadienne," "Falcon," "Maisonneuve," "Frontenac," "Shamrock," "Reserve," "Aberdeen," "Osprey," "Curlew." It should be remembered here, that several of these vessels: the "Druid," "Bayfield," "La Canadienne," etc., are the second of their respective names in the services.

These vessels are divided into two classes, designated, "The Dominion Steamer " fleet and "The Dominion Cruiser" fleet. Included in the latter classification are the "Canada," "Vigilant," "Kingfisher," "Osprey," "Falcon," "La Canadienne," "Petrel," "Curlew," "Constance," and "Kestrel." The vessels of the steamer fleet are employed almost exclusively in lighthouse and buoy works; the cruisers being engaged chiefly in the fishery protection and customs preventative services.

There are also in the service of the department the following steam tugs: "Champlain," "Swan," "De Levis," "St. Francis," "Montcalm," "James Howden," "Cartier," "Amelia," "Georgia," "Eureka," "Jessie Hume," "Lac St. Pierre" and "Jean Iberville."

A few figures indicate what a marked increase there has been in the fleet of the Marine Department during the past few years. In 1884 the cost of maintaining the Dominion Government steamers of all classes was $122,816.25, which sum in 1894, ten years later, had grown to $142,487.42. In 1899 this account had only risen to $145,270.75 During the past five years the figures have been as follows: (1900), $180,975.45; (1901), $195,484.75; (1902), $241,060.98; (1903), $279,-348.06; (1904), $306,171.07.

Significant of the recent expansion of the fleet flying the Canadian blue ensign as these figures are, they convey no idea of a remarkable change which has been effected during the past couple of years in the character of the little squadron. The most recent additions have been vessels of a type vastly superior to the older ones, and the two latest additions, the "Canada" and the "Vigilant" commissioned in 1904, are armed third-class cruisers, as smart and as naval-like in their appearance as any ships of their class in the Royal Navy.

They have been described, in fact, and not inaptly, as the nucleus of Canada's Navy. True, the older cruisers of the Department, having had guns aboard, and with their crews uniformed and disciplined somewhat after the naval system, may claim that distinction, but they were, after all, with the exception, perhaps, of the "Constance" and Curlew," but armed yachts or merchant vessels. The "Canada" and "Vigilant," with their ram bows, raking masts and funnels, powerful searchlights, and permanent gun mountings, are unmistakeable warships; small, no doubt, but efficient cruisers for their size.

The "Canada" was built by Vickers, Sons & Maxim, at Barrow in Furness, England, is armed with four 1½-pounder quick firing automatic mark 3, 1904 guns; two forward and two aft. She carries a crew of 75 officers and men all told, and is fitted with the Marconi apparatus. Her dimensions are as follows: 200 feet long, 25 feet beam, and 10 feet 6 inches draft of water. A number of the officers and crew have been through a course of instruction and received first-class certificates in gunnery. This vessel is also armed in the way of small arms, with the new pattern Ross rifle, and the new Service D. A., Colt's revolvers.

The "Vigilant" is a steel, twin-screw, small third-class cruiser,

built by the Polson Iron Works, Toronto. This vessel on her steam trial made a speed of twenty-one and a half miles an hour. She is 175 feet long, 22 feet beam, and draws 10 feet of water She carries the same guns and the same small arms as the "Canada," and is intended for the protection of the fisheries on the great lakes. This vessel is the first of her class ever built in Canada, and is a credit in every way to the Polson firm of Toronto. She carries a crew of officers and men all told, of fifty-three.

The sister cruisers "Constance," "Curlew" and "Petral," specially built for the service, and first commissioned in 1892, marked a stage of transition between the cruisers of "La Canadienne" class and the pure naval type exemplified in the "Canada" and "Vigilant." The "Constance" was built for service in the river St. Lawrence and Gulf, more particularly for the purpose of putting a stop to the smuggling which had been going on for some time between St. Pierre-Miquelon, and the river parishes; and the "Curlew" for purely fisheries service in the Bay of Fundy. The dimensions and speed of these vessels are exactly alike. The "Marine Review," of Cleveland, Ohio, in describing the "Constance," at the time of her launch, said:—

"The 'Constance' and sister ships are far superior to the boats maintained on the Lakes by the United States Revenue Department. In case they were ever needed for such purpose they would make very formidable lake commerce destroyers. The entire vessel, hull, engines, boiler and equipment were built by the Polson Company from their own designs. One feature of the construction of the 'Constance,' is a novelty in our fresh water designs, and is taken from the plans usually followed in the British navy. The ram bow is a formidable weapon, and in the 'Constance' it is constructed with a view to severe service. The stem forging is very heavy and is reinforced with heavy plates and angles, making it almost solid for some seven or eight feet back."

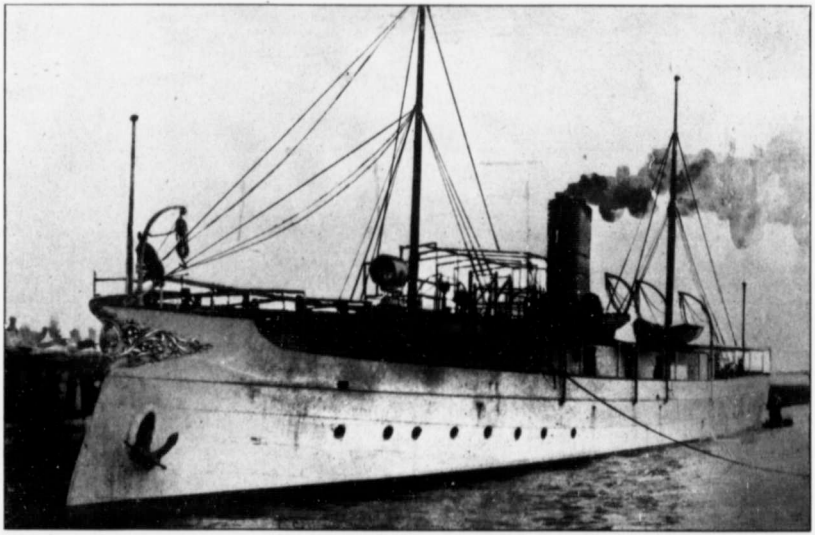
To trace the services and development of the smart Canadian fisheries protection fleet, it is necessary to refer to some of the salient points of the long-standing disputes with the United States regarding the Canadian shore fisheries.

In the Treaty of 1783, which recognized the independence of the United States, and which was negotiated during the ascendancy of the British political party, which had always been friendly to the revolutionary party in the old American Colonies, had been opposed to the war, and which on attaining power was anxious to obliterate all existing ill-feeling; it was provided that the people of the United States should enjoy unmolested the right to take fish of every kind on the Grand Bank and all the other banks of Newfoundland, and also in the Gulf of St. Lawrence, and at all other places in the sea where the inhabitants of both countries used at any time before to fish, and also that the inhabitants of the United States should have liberty to take fish of every kind on such parts of the coast of Newfoundland as British fishermen used (but not to dry or cure the same on that island), and also on the coasts, bays and creeks of all other of His Britannic Majesty's dominions in America; and also that the United States fishermen should have liberty to dry and cure fish in any of the unsettled bays, harbors and creeks of Nova Scotia, so long as the same remained unsettled. This stipulation gave the United States fishermen the right of practising their calling in the deep sea fisheries, but conveyed to them liberty to take and cure fish only on certain defined portions of the British North American coasts under expressed limitations.

This treaty continued to be in the United States fishermen's charter until it was annulled by the War of 1812. The Commissioners of Ghent, in 1814, discussed the question whether the fishing liberties had been forfeited by the United States by the War of 1812. Mr. Adams suggested to his associates, and Mr Clay embodied in a proposition to be presented to the British Commissioners, the principle that the United States held their rights of fishing by the same tenure that they held their independence; that, unlike another class of treaties, the Treaty of 1783 should be regarded as perpetual, and of the nature of a deed in which the fisheries are an appurtenant of the soil conveyed or parted with, and that therefore no stipulation was necessary or desirable to secure the perpetuity of the appendage more than of the territory itself. The British Commissioners bluntly refused to deal with the United States on that basis, holding that complete forfeiture of the rights and liberties, under the Treaty of 1783, resulted from the War of 1812, which was declared by the United States with the avowed object of conquering and annexing Canada, at a time when Great Britain, practically alone, was confronting the world in arms. In the Treaty of Ghent, therefore, nothing is said about the fishery question.

After the peace, an American vessel was warned off the Coast of Nova Scotia by an armed British ship in June, 1815, when about forty-five miles from Cape Sable, and her papers were endorsed "warned off the coast, and not to come within sixty miles." Eleven or twelve United States fishing vessels were seized in Nova Scotia on June 8th, 1817, in consequence of their frequenting some of the harbors of that Province. In 1818 the fishing vessels "Nabby" and "Washington" were seized and condemned for entering and harboring in British American waters. These proceedings led to protest and discussions, which ended in the treaty of 1818. This treaty was a compromise between the extreme views of both parties.

By the terms of this convention United States fishermen have secured to them forever the liberty, 1st, to take fish (*a*) on the southern coast of Newfoundland from Cape Ray to the Rameau Islands; (*b*)



CANADIAN ARMED CRUISER "VIGILANT"

SPEED, TWENTY-TWO MILES AN HOUR; ARMAMENT, FOUR AUTOMATIC QUICK-FIRING GUNS

on the western and northern coasts of Newfoundland, and from Cape Ray to Quirpon Islands; (*c*) on the shores of the Magdalen Islands, and (*d*) on the southern coast of Labrador from Mount Joly to and through the Straits of Belle Isle, and thence northwardly indefinitely along the coast. 2nd. To dry and cure fish in any of the unsettled bays, harbors and creeks of the southern coast of Newfoundland and the coast of Labrador as described in the Treaty. 3rd. To be admitted to the bays and harbors of His Britannic Majesty's dominions in America, for the purpose of (*a*) shelter, (*b*) repairing damages, (*c*) purchasing wood, and (*d*) obtaining water, and for no other purpose whatever.

The distinguished features of this article, as compared with the stipulation of 1783, are: (1) That the Americans gave up the catching along certain shores, and (2) secured increased facilities for drying and curing their catch. In effect they surrendered the inshore fisheries, except on certain shores, and secured the deep sea fisheries.

Shortly after this treaty was negotiated, the fishermen of Nova Scotia complained that notwithstanding this prohibition, those of the States purchased bait from the inhabitants, set their nets in the harbors of the Province, and in other respects violated the convention. In the spring of 1819 a United States fishing vessel, the "J. H. Nickerson" was seized for having purchased bait within three marine miles of the Nova Scotia shore, and condemned by the judgment of Sir William Young, Chief Justice of Nova Scotia, and Judge of the Court of Vice-Admiralty.

Violations of the treaty steadily increased. In 1837 loud complaints were made by the fishermen of Nova Scotia against the infringement of existing treaties by the citizens of other nations—particularly those of the United States and France. Representations were made by the Assembly to His Majesty's Government on the subject, and $500 was voted for the purpose of arming small vessels, to protect the fishing interests of the Province.

This was the first step towards the establishment of a Canadian fisheries protection service. After a few years, a more far-reaching advance in the same direction was made.

In 1839 the "Java," "Independence," "Magnolia" and "Hart" were seized and confiscated, the principal charge being that they were within British American waters without legal cause. In 1840 the "Papineau" and "Mary" were seized and sold for purchasing bait.

By 1851 the encroachments upon the inshore fisheries of Nova Scotia, New Brunswick and Lower Canada had become so numerous that the colonial governments determined to take effective means to protect the fisheries. A convention of colonial delegates was held in Toronto, and an agreement signed on June 21st, 1851, by which Canada, Nova Scotia and New Brunswick joined in the policy of protecting their fisheries by means of fast sailing schooners, the Imperial Government agreeing to coöperate.

The United States Government was informed of the concert, and Daniel Webster, the then Secretary of State, drew up a paper in which he said "it would appear that by a strict and rigid construction of Article 1 of the Treaty of 1818, fishing vessels of the United States are precluded from entering the bays or harbors of the British Provinces, except for the purposes of shelter, repairing damages and obtaining wood and water."

Dr. Pierre Fortin, who had been in the quarantine service, was in 1852 appointed Stipendary Magistrate for the Lower St. Lawrence and Gulf, and in that capacity, organized the service for the protection of the sea and river fisheries in those parts. He was head of that service from 1852 until Confederation, when he resigned. He first had under him the armed steamer "Doris" and afterwards the armed schooner, "La Canadienne," built specially for the purpose. While on duty in 1861, Dr. Fortin, locally known as "The Commodore," was shipwrecked on the north coast of the Gulf during a violent snow storm. Dr. Fortin, after resigning from the Fishery Protection Service, became well known in public service, serving for many years in the Quebec Provincial Legislature and the Dominion House of Commons. He was eventually called to the Dominion Senate, May 13th, 1887, and introduced to that Honourable Body, May 18th, the same year. He died June 15th, 1888, aged sixty-five.

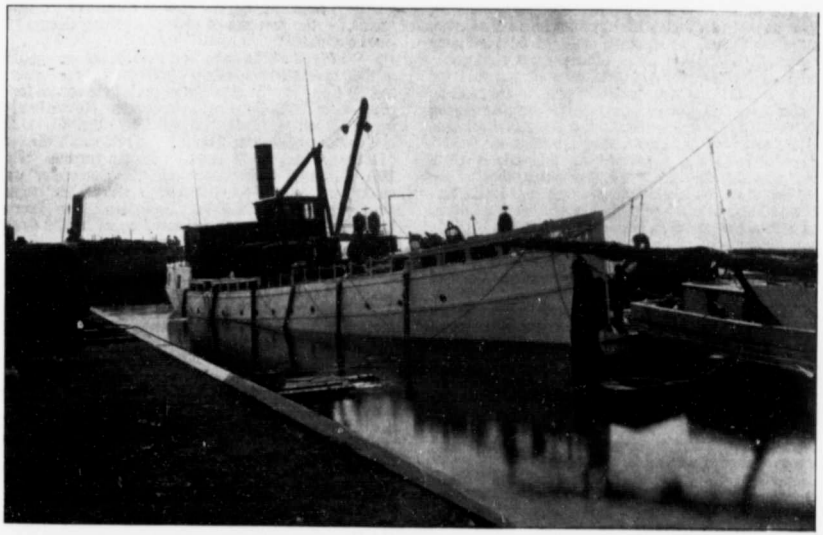
The treaty of 1854 put an end to the quarrels, and to the fisheries protection fleet called into existence thereby, and American fishing vessels entered British North America ports on the same terms as British fishing vessels, in exchange for a reciprocal trade arrangement.

The United States Government having given notice of intention to abrogate the Treaty of 1854, delegates from the British North American Provinces went to Washington in January, 1866, to hold a conference with the authorities there on the subject, but were obliged to leave without any settlement, for the future, of the questions that would be revived on the expiry of the Treaty.

In the meantime, in deference to the wishes expressed by Her Majesty's Government, a temporary expedient of issuing season licenses to United States fishing vessels at a nominal tonnage rate was adopted. This system was maintained for four years. In 1866, 365 vessels were licensed, $19,877.50 being collected in fees; in 1867, 270 vessels, $13,929; in 1868, fifty-six vessels, $5,573.73; in 1869, twenty-five vessels, $2,041.61.

Such was the situation while the Department of Marine and Fisheries was in course of organization in 1867 and following years.

The fleet transferred to the Department of Marine and Fisheries by the provinces at Confederation included the smart schooner "La



DOMINION GOVERNMENT STEAMER "SCOUT," EMPLOYED IN GAS BUOY SERVICE ON ST. LAWRENCE RIVER

Canadienne" whose name is historical in connection with the Canadian fisheries protection service. She was specially built in 1855 for the service, and designed for speed. Her model, still preserved in the Library of Parliament, shows a hull which would do credit to a modern yacht designer. Her length was 92 feet, beam, 23 feet, 10 inches; depth, 10 feet, 6 inches. After Confederation she was retained in the same service and performed satisfactory duty for several years longer.

The provincial steamers transferred to the Department upon its organization were the "Napoleon III." "Lady Head," and "Advance" at Quebec; the steamer "Richelieu" at Montreal, and the steamer "Druid" at Halifax. It was considered advisable to dispose of the steamer "Advance," as she was reported unfit for service, without a large outlay for repairs, and the Government decided to sell her, and a sale was subsequently effected for $4,050 cash.

The "Napoleon III." and "Lady Head" were both described as powerful, efficient iron screw steamers, and were employed on Trinity House Service, such as supplying the lighthouses, laying down and taking up buoys, taking the pilot apprentices down the river, towing wrecked or disabled vessels, rendering assistance to shipping coming up the St. Lawrence when necessary, and assisting to remove obstructions in the river, and on such other services as might be required of them. The "Napoleon III." measured 211.98 tons register, and 300 horse-power. The "Lady Head" measured 168.06 tons register, and 150 horse-power.

The steamer "Druid" at Halifax was described as a good strong side wheel iron steamer, but when handed over to the Dominion Government required heavy repairs, which were made in the spring of 1868, being then in thorough working order. She measured 165.63 tons register, was 170 horse-power, and was employed in 1867 in supplying lighthouses and other coast service. It was proposed to employ her in future in the protection of the fisheries as well as the lighthouse service.

The amount voted by Parliament for the maintenance of the steamers at Quebec, for the year ended June 30th, 1868, was $75,000, and the amount expended was $69,026.73.

The amount voted for the maintenance and repairs of the steamer "Druid" for that year was $20,000, and the amount expended was $18,857.46.

The Government schooner "Daring," which was formerly employed in the lighthouse and other coast service, was lost at Herring Cove, some miles below Halifax Harbor, in December, 1867, during a heavy snow storm, and another schooner was chartered to take her place in the Sable Island service, and deliver supplies until the "Druid" was repaired.

Prince Edward Island was not in the original Confederation, and the United States hoped to take advantage of that fact. In 1868 a committee of the United States House of Representatives proceeded to Prince Edward Island to effect an exceptional arrangement by legislative enactment by virtue of which United States' fishermen should obtain fishing and other privileges from the Island Province that would enable them to do without such privileges in the other Provinces. All the propositions made by the Committee took it for granted that the Convention of 1818 regulated the fisheries.

Through Lord Monck, the Governor-General, an effort was made to secure the coöperation of the vessels of the Royal Navy in Canadian waters in enforcing the licensing system already referred to, but without complete success. June 8th, 1868, Vice-Admiral Mundy wrote from his flagship "Royal Alfred" from Halifax to Lord Monck:

"I regret that I am unable to comply with the suggestions offered by Mr. Mitchell, Minister of Marine and Fisheries, that the captains in command of Her Majesty's ships employed in the Gulf of St. Lawrence for the protection of the fisheries, should take charge of and issue licenses to any fishing vessels which they may fall in with, and find unprovided with them.

"It is not within the province of the duties of a ship of war to undertake this service, more especially as it would appear from the last paragraph of Mr. Mitchell's letter, that the money which the master of the fishing vessel might be provided to pay would be received by the captain of Her Majesty's ships, and subsequently paid over to the credit of the Receiver-General."

The Admiral arranged, however, that the officers in command of the cruisers would be furnished with the list of the places named by the Minister of Marine and Fisheries at which licenses were to be issued to United States vessels, and when the boarding officer found that the vessel he had visited had not the required license, he would indicate the stations where these might be procured, acquainting the master at the same time that he would be liable to detention if he should again be met within British limits unprovided with a license.

March 15th, 1869, Vice-Admiral Mundy, writing from his flagship at Bermuda to Sir John Young, Bart., Governor-General, stated:

"I have the honor to acquaint your Excellency that I have directed Commodore Phillimore, the Senior Officer at Jamaica, to send to Bermuda, the "Niobe," "Royalist," "Dart" and "Mullet," which vessels I propose to employ in the ensuing summer for the protection of the Fisheries in Newfoundland and the Gulf of St. Lawrence.

"I have also ordered the "Phoebe," Frigate, Captain Bytheseed, to rejoin my flag to this Island from Barbadoes, and she will be ready to proceed to Quebec on the opening of the navigation, should the

Lord Commissioners of Admiralty desire me to afford a vessel of war of her class to that part of my command.

"The 'Minstrel' Gunboat will also be stationed on the Northern Division.

"The 'Britomart' Gunboat now employed in the West Indies, might come to the northward if actually necessary, though her services, on account of the disturbed state of Hayti and Cuba, are useful in the South."

In his annual report of the operations of his Department for 1869 the Hon. Peter Mitchell wrote:

"The continued admission of foreign fishing vessels and fishermen to participate in our valuable coast fisheries, on paying a nominal license fee, as authorized by the Act of last session of Parliament, has not operated satisfactorily; the payment of the fee being in most cases altogether evaded. American vessels have boldly entered into our bays, creeks and harbors, and have actually crowded out the native fishermen, and fished without any regard to treaty obligations. The crews of these vessels have, in several instances, created serious disturbances, and committed outrages against the persons and property of fishermen and settlers. Measures are now in course of adoption to prevent the continuance of these vexatious and illegal intrusions; the system of licensing foreign fishing vessels has been discontinued, and a force of Marine Police is now formed to protect our inshore fisheries and to guard British fishermen against molestation.

"The very liberal and conciliatory means which were devised by Canada on the termination of the Reciprocity Treaty, in order to obviate the entire exclusion of Americans from our inshore fishing grounds, have not met with the slightest appreciation; but on the contrary, the United States Government, have not, so far as I am aware, taken any special steps to promote compliance with the licensing system, while United States fishermen have done all in their power to defeat and evade its chief conditions. Indeed it seems to be viewed as strengthening the popular belief in the validity of their own extravagant and untenable claims, and the assumed weakness of Canadian jurisdiction. It is, therefore, fast degenerating into a virtual abandonment of all national rights of fishery on our own coasts. The time has arrived when we must either abandon this authoritive right, or assert and maintain it on the basis of treaties existing between Great Britain and the United States."

During 1869 the Dominion Government Steamer "Druid" was employed in the Fisheries Protection and Lighthouse service of Nova Scotia, Commander P. A. Scott, R.N., being appointed to her command and assuming charge on May 12th. Commander Scott lost no time in equipping the "Druid," and victualing and preparing for the work in which she would be employed. As soon as gun ports could be cut, gun carriages made, small arms and ammunition received from the Government stores, etc., he left for Sable Island arriving there on June 3rd.

In his report to the Minister at the end of the season Commander Scott wrote:

"It will be seen that the Americans are in the habit of fishing inshore, contrary to law, during the absence of the cruisers, and seem determined not to take licenses. Now, as they are not liable to capture without warning being given, they find many opportunities of evading it. I would most respectfully suggest that in future they should be liable to capture when found fishing within the limits, without any previous warning."

The failure of the license system being apparent it became necessary to adopt further measures for the efficient enforcement of British rights, and by an Order-in-Council of the Dominion Government dated January 8th, 1870, it was decided to abolish the system of licenses and to equip a sufficient force for the protection of the coasts. It was decided to place the force of cruising schooners employed on this service under the command of Commander Scott.

The "Druid," the flagship of the previous season, having been found unsuitable for sea-work it was arranged to exchange her for the "Lady Head," which had been on service at Quebec. The "Druid" was built in Glasgow in 1856 for a river boat. It was proposed in 1870 to sell her if a reasonable offer could be obtained for her, and for that purpose she was moved up to Quebec where there was a larger market and a better opportunity of inspecting her than at Halifax, and until a sale could be effected was to be there employed in the light and buoy service.

Besides the "Lady Head" (the new flagship), the Canadian fisheries protective fleet during the season 1870 included the schooners "England," Commander G. V. Storey (late lieuentant R.N.); the "Water Lily," Commander Ewen, R.N.R.; the "Ella G. McLean," Commander Betts, R.N.R.; "La Canadienne," Capt. M. Lavoie; "Ida E.," Capt. J. A. Tory; "Sweepstake," Capt. J. C. Carmichael; "Stella Marie," Capt. L. H. Lachance These vessels appear to have performed efficient service. In addition to these Canadian cruisers, a number of the vessels of the Royal Navy were engaged to patrol the fishing grounds.

Changes in the command of the North Atlantic Squadron of the Royal Navy appear to have been very frequent about this time. September 27th, 1870, being then on the point of relinquishing the command, Vice-Admiral George S. Wellesley writing from the "Royal Alfred," at Halifax, to His Excellency Sir John Young, stated:

"I cannot refrain from bringing to Your Excellency's notice that

the few Colonial schooners which have been employed on the Fisheries this year have been of great use in preventing American fishermen from violating the law by fishing within the three mile limit, and it is my opinion that it would be most advisable to increase this force next year to at least two schooners on each fishing station, so that one might always be in company with the respective fleets of fishing vessels."

Vice-Admiral E. G. Fanshawe, who succeeded Vice-Admiral Wellesley, in a report to the Governor-General at the end of the year 1870 wrote as follows :

"It must be evident that the number of the United States fishermen who frequent the Fisheries is too large, and their determination to trespass upon Colonial Coast Fisheries too general, to admit of the law being maintained, without the adoption of vigorous repressive measures.

"I am of the opinion that the three objects of—1st. Protection to the Colonial Fisheries—2nd. Unrestricted commerce for the Colonial Traders—3rd. Avoidance of all reasonable ground of irritation in the United States, may best be accomplished by an adequate Colonial Preventive Force, systematically organized, in which the stationary Civil Officers, and the Commanders of the vessels should be furnished with sufficient powers, and with well-defined instructions.

"This would certainly involve a considerable extension of the Colonial means now employed, and a corresponding increase of expense; but I apprehend that the latter would be more than compensated, by efficient protection to the Colonial Fishermen on their own grounds, and by unrestricted liberty of Commerce to the Traders.

"I think also that proceedings at law would be more simple, and more readily brought to a termination, where the captor was a Colonial Officer, acting under Colonial law.

"The presence of ships of war is necessary so long as ships of war of the United States are stationed off the Coasts, and they are always useful as auxiliaries when so employed, but they are not suited for the general requirements of the preventive service, which should mainly be carried on by vessels similar in appearance and rig to the fishing vessels."

The vessels of the Royal Navy engaged in the Fisheries Protection service during the season 1870, besides the flagship "Royal Alfred," included Her Majesty's gunboats, "Britomart," "Cherub" and "Royalist," all of which had been some years before on service on the Upper St. Lawrence and Lakes, besides H.M.S. "Plover," "H.M.S. "Lapwing," H.M.S. "Philomel," H.M.S. "Sphinx," H.M.S. "Valorous." These vessels were all assigned to certain well-defined patrol stations.

Notwithstanding the presence of such a considerable fisheries protection fleet, United States fishermen did their best to evade the law, and during the season no less than fifteen United States fishing vessels were seized, and most of them condemned by the Vice-Admiralty Court and sold. Two of the condemned vessels, the "S. G. Marshall," seized by H.M.S. "Valorous," and the larger schooner "J. H. Nickerson," seized by the "Ida E.," were purchased by the Department and added to the Fisheries protection fleet.

The object of the conference held at Washington in 1871, and which resulted in the negotiation of the Washington Treaty, was primarily to devise means to put a period to the ill feeling developing between the two countries as a result of the trouble about the Canadian fisheries. Although the Washington Treaty was negotiated in 1871 the "Fishery Articles" thereof only came formally into operation on July 1st, 1873, by proclamation of a conference at Washington between Her Majesty's Minister and the United States Secretary of State on June 7th, 1873. The protocol recited the several Acts passed respectively by the Parliament of Canada on June 14th, 1872, the Legislature of Prince Edward Island on June 29th, 1872, and the United States Congress on March 1st, 1873. In the case of Canada it was deemed advisable to admit United States fishermen to the practical use of the specified privileges in advance of this formal completion of the treaty stipulations. An official communication to such effect was made early in the springtime of 1873, and under a "Circular" from the United States Treasury Department, dated April 1st, 1873, United States fishermen at once availed themselves of the freedom of Canada's inshore waters. It was fully acknowledged, through the United States Secretary of State, as a "courteous and liberal act" on the part of the Dominion Government.

Owing to the delay in passing the necessary measures to give effect to the Articles of the Treaty of Washington affecting the fisheries, the Marine and Fisheries Department was required to maintain up to the end of the fishing season of 1872 the full Fisheries Protection Service or "Marine Police Force," as it came to be called.

During the season of 1871 eight vessels, most of them chartered vessels, were employed on this duty. They were as follows :

Steamer "Lady Head," Capt. P. A. Scott, R.N., in general command; schooner "New England," D. M. Browne, Esq., R.N., commander; schooner "Sweepstake," J. A. Tory, Esq., commander ; schooner "S. J. Marshall," G. W. Creighton, Esq., commander; schooner "Water Lily," G. V. Story, Esq., R.N., commander; schooner "Ella G. McLean," H. E. Betts, Esq., commander; schooner "Stella Marie," L. H. Lachance, Esq., commander.

Schooner "La Canadienne," N. Lavoie, Esq., commander, was incidentally engaged in the same service.

Three United States fishing vessels found trespassing on the inshore fishing grounds were seized. These were the "Samuel Gilbert," the "Franklin S. Schenck," and the "E. A. Horton." The first two named were condemned in the Court of Vice-Admiralty at Quebec; and the third was stolen, by or on behalf of her former owners, from the custody of the Customs Collector at Guysboro, N.S., while the judicial proceedings instituted against her were in actual progress.

During the season of 1872, the vessels employed as cruisers were the following :

The steamer "Lady Head," Capt. P. A. Scott, R.N., in general command; the schooner "Peter Mitchell," D. M. Browne, Esq., R.N., commander; the schooner "J. W. Dunscombe," J. A. Tory, Esq., commander; the schooner "S. G. Marshall," J. A. Nickerson, Esq., commander; the schooner "New England," W. T. Frost, Esq., commander; the schooner "Katie," G. Matson, Esq., commander; the schooner "Stella Marie," L. H. Lachance, Esq., commander; schooner "J. H. Nickerson," Capt. J. N. Purdy.

The schooner "La Canadienne," N. Lavoie, Esq., commander, was occasionally employed in cruising.

Only two United States fishing vessels, found committing trespass, were captured during the year; they were the "Enola C.," and "James Bliss," both of Gloucester, Mass. The first was detected trawling for halibut at Trinity Bay, near the Point des Monts lighthouse, on the north shore of the River St. Lawrence. The second was found fishing with trawlines, also for halibut, near the East Point lighthouse, on the island of Anticosti. Both captures were brought to Quebec, and libelled in the Vice-Admiralty Court. They were subsequently released under bonds, which sureties were subsequently discharged by the Government.

During the year 1871 a new name appears among the list of steamers of the Marine and Fisheries Department. The steamer "Sir James Douglas" stationed at Victoria, British Columbia, was handed over to the Department when that colony joined the Confederation of the Dominion, on July 20th, 1871. She was built of wood in Victoria Harbor, in 1864, for the Government of Vancouver's Island, and was launched on January 1st, 1865.

She was originally built for the purpose of assisting in the dredging of Victoria Harbor, in connection with a dredger and large mud punts, and was employed in that service during 1865, when it was found to be too expensive for the finances of the colony, and after a short trial in that year it was decided to abandon all idea of dredging the harbor, and she was then left without employment, except occasionally visiting the two lighthouses, the lightship and the buoys. When it was found that she was unemployed in 1866, the government of the colony, on a requisition being made to it by the settlers on the east coast of Vancouver's Island, placed her on the route between Victoria and Comox once a fortnight, a distance of 150 miles.

About the time the "Sir James Douglas" was handed over to the Department, another steamer was placed by private enterprise on the route previously occupied by her, and she was withdrawn "as it is only the policy of the Department to employ any of the steamers under its charge in competition with private interests." (Annual Report). She was thenceforth employed only in attending on the lighthouses, lightships, buoys and other Government work which may be required.

The six steamers belonging to the Department at the beginning of the year 1873 were the "Napoleon III.," the "Druid," and the small Police Steamer "Dolphin," at Quebec; the Trinity House of Montreal Steamer "Richelieu," at Montreal; the "Lady Head," at Halifax; and the "Sir James Douglas," in British Columbia.

During 1875 two additional steamers were added to the Department's fleet, the "Newfield" and the "Glendon."

The steamer "Newfield" was an iron screw steamer, which was bought by the Minister, at London, in August, 1875, for the purpose of carrying coals to the steam fog-whistles and the coal depots of the Department at Quebec, Gaspe, Whitehead, in Nova Scotia and Halifax, and also for carrying oil and other supplies to the lighthouses.

Her dimensions were as follows: Length, 206 4-10 feet; breadth, 29 1-10 feet; depth, 16 8-10 feet, and her tonnage was 784 91-100 tons gross, and 508 82-100 tons register; she was schooner rigged, and strong and substantially built, with between-deck beams, was double-rivetted throughout; and classed in British Lloyds 90 A1, to carry dry and perishable cargoes to and from all parts of the world, subject to periodical survey. She was built in Sunderland in 1870, by Mr. R. Thompson, jr., and commenced running in 1871, and was placed in the dry-dock and re-surveyed in the spring of 1875.

The "Glendon" was purchased to replace the old historical schooner "La Canadienne," which had remained in continuous service in the fisheries protection service in the Gulf of St. Lawrence for twenty years. In 1875 the old cruiser was reported to be too old and worn out to be safe for service in the Gulf, where heavy weather prevails in the fall of the year, and it was decided to withdraw her from that service and send her to Halifax, to be kept there for the purpose of attending to the laying of the buoys at the entrance of that harbor, or for occasional lighthouse service. She was accordingly sent down there in the spring, but, unfortunately, was wrecked at St. Paul's Island, while delivering supplies there on August 20th the same year. At the time she was wrecked she was under the charge of Captain Browne, an officer of the Department at Halifax, and Navigating Lieutenant of the Royal Navy.

It was considered by the Department that instead of procuring a sailing vessel for the protection of the fisheries on the Labrador Coast and the Gulf of St. Lawrence in place of "La Canadienne" that it would be more advantageous to the public service to employ an auxiliary screw steamer, so as she could keep moving about from place to place during calm weather when a sailing vessel would have to remain stationary, and enquiries were made relative to the screw stenmer "Glendon," of St. John, New Brunswick, which was offered for sale to the Department for the sum of $26,000. As this vessel was built for carrying freight, of which she could carry 300 tons, in addition to 30 tons of coal in her bunkers, it was considered by the Department that she would be suitable either for the fisheries protection service or the lighthouse service, where a high rate of speed was not required. She was consequently purchased for $20,000, about two-thirds of her original cost, and was fitted up at Quebec for the fisheries service.

It was ascertained when she was on service, during the summer, that while she could steam as much as ten or eleven knots an hour with a fair wind; in some kinds of weather with a head wind, she could not steam over five or six knots an hour, and in heavy gales, with head wind, she could scarcely make headway. It was consequently decided that she was not sufficiently powerful for the service in the Gulf in the protection of the fisheries, but would suit very well for the bouy service and for supplying coal, oil, and supplies to the steam fog whistles and lighthouses to the west of Halifax, and in the Bay of Fundy, and she was subsequently employed on that service, the "Lady Head" being employed on the fisheries protection service in the Gulf until 1878, when she was wrecked near Fox River.

Then followed a few years during which the fisheries protection, and even inspection, services were much neglected for want of suitable vessels, the fisheries officers being unable to visit many important stations, as the steamers "Druid," "Napoleon III.," "Glendon," "Newfield," etc., were employed on lighthouse and other duties.

W. Wakeham, M.D., Fishery Officer in charge of the fisheries protection service in the Gulf and Lower St. Lawrence, during the season 1879, in his annual report wrote :

"I trust that next season I may be in a position to say that I have visited the entire coast; it will be impossible to do this unless the Department sees fit to furnish me with a suitable vessel to replace the one lost in 1878. It is absolutely necessary that some kind of a vessel be furnished for this service, especially on the lower part of the North Shore, where a great number of vessels from the United States, Newfoundland and the Maritime Provinces, congregate for the cod fishery. As these vessels almost all use cod seines they are constantly getting into trouble with our band and seine fishermen, and it is utterly impossible for the local officers to carry out the law, isolated as they are, and utterly unsupported by any force to carry it out. * * * In former years, in addition to our own vessel, there were always one or two English gunboats cruising on the Gulf coast; during the last few year, these vessels even, have been withdrawn. There is a widespread feeling on the coast among those who fish, and those who have large sums invested in the fish trade, that they are not furnished with that amount of protection that they have a right to expect."

In the early part of the year 1881 a steamer was bought in England to replace the "Lady Head" in the fisheries protection service. This was "La Canadienne," formerly called the "Foxhound," and the price paid for her was £8,000 sterling. "La Canadienne" is an iron screw steamer, built in 1880 by Robert Duncan & Co., of Port Glasgow, and is of sixty horse-power. Her dimensions are as follows, viz.: length, 154.3 feet; breadth, 22.7 feet; depth of hold, 10.9 feet; net tonnage, 227 tons; gross tonnage, 372 tons. She was employed during the season of 1881 in attending to the protection of the fisheries; but was unfortunately wrecked on White Island Reef in the Lower St. Lawrence on November 4th while in charge of a pilot, but was floated off and brought to Quebec in a very damaged condition. The expenses of floating off and repairing was very heavy, but she has done good service ever since.

Activity in the Fisheries Protection Service developed materially as a result of the abrogation of the Fishery clauses of the Treaty of Washington (1871). This treaty was abrogated as to its fishing clauses by the Congress of the United States, and ceased to be an operative instrument on July 1st, 1885, the President, by proclamation, dated January 1st, 1885, announcing that articles 18, 19, 20, 21, 22, 24, 25, 30, and 32 would terminate on that date.

Since that date the Americans have set up the plea that the Treaty of 1818 was modified by "the understanding and agreement of 1830," contending that "the Arrangement of 1830" is the charter of American vessels for trading purposes, the United States Government authorized the issue of Touch and Trade permits to their fishing vessels, and Article XXIX. of the Treaty of 1871 being retained among the non-abrogated clauses, they believed that they had successfully evaded one great source of loss to their fishermen, viz., the necessity of bearing away to a port in the United States to discharge their cargoes of fish. The Canadian Parliament passed in 1886 an Act regulating fishing by foreign vessels, under which vessels found in Canadian waters for any purpose not permitted by Treaty or Convention should be forfeited. This Act, assented to by the Queen, interpreted the Order-in-Council of 1830, so as to make it plain that fishing vessels were not included in the category.

It had better be stated here, probably, as a matter of record, that a

Fishery Commission under Articles 22 and 23 of the Washington Treaty of 1871, first met in Halifax June 15th, 1877. The result of their investigations was the award (dated November 23rd, 1877) to Canada and Newfoundland of $5,500,000 as a return for privileges granted the United States, under Article 18 of the Treaty. The amount was paid by the United States in December, 1878, Canada obtaining as her share $4,490,882. It is interesting to recall that the counsel employed by the United States to present their case before this Commission advanced the claim that the Canadian fisheries belonged to the United States in common with British subjects, on the ground that Massachusetts had helped to wrest the Maritime Provinces from the French. This claim was met by the counsel for the Canadian side, showing that the Massachusetts Legislature presented their bill for services rendered at Louisburg and that the British Parliament voted, and the British Government paid, £15,000 for the same. He suggested that if the United States would pay back the £15,000, with twenty-five years' interest (compounded) his clients would be fully satisfied to allow the United States claim. They did not accept this offer.

During the years the Washington Treaty was in operation, between 1873 and 1885, there were no disputes and no seizures of United States fishing schooners. Upon the termination of the Treaty, there was no other course left the Canadian Government but to adopt means for the protection of its rights as secured by the Convention of 1818. Steps were, in consequence, immediately taken for the equipment of a Fisheries Protection Force, and the following vessels were put in commission in the spring of 1886, and continued to cruise on their respective stations until the close of the fishing season, except the flagship, which was relieved about the middle of September by the new Dominion Government Steamers: "Acadia," 484 tons, purchased in August at a cost of $40,000; "Lansdowne," Capt. P. A. Scott, R.N.; "La Canadienne," Capt. Wm. Wakeham; schooners, "L. Houlett," Capt. C. M. Lorway; "Terror," Capt. Thos. Quigley; "General Middleton," Capt. James McLean; "F. E. Conrad," Capt. M. Smeltzer; "Critic," Capt. Wm. McLaren; "Lizzie Lindsay," Capt. L. Poulhiot.

Three United States fishing vessels were seized during the season for violation of the Treaty rights, viz.: Schooners "D. J. Adams," "Ella M. Doughty," and "Highland Light." The latter vessel, a large and fast-sailing craft, being condemned before the Vice-Admiralty Court of Charlottetown, was purchased by the Marine and Fisheries Department, and, for many years subsequently, under the name "Vigilant," rendered useful service therein.

The following cruisers were employed during the season of 1887 in the fisheries protection service: Dominion Government Steamers: "Acadia," Lieut. A. R. Gordon, R.N.; "La Canadienne," Capt. W. Wakeham; schooners, "Vigilant," Capt. C. M. Lorway; "Gen. Middleton," Capt. James McLean; "L. Houlett," Capt. Thos. Quigley; "Triumph," Capt. C. M. Lorway; "Advance," Capt. C. T. Knowlton; "Critic," Capt. W. M. McLaren; "A. C. Moore," Capt. L. Pouliot; steam yacht "Intrepid," Capt. J. H. Pratt; steam yacht "Dream," Capt. W. H. Kent.

The "General Middleton" was employed until February 7th, cruising in Passamaquoddy Bay. The steam yacht "Intrepid" was replaced by the "Dream" about the beginning of the autumn. The only seizure effected during the season for fishing within the prescribed limit was made by the cruiser "Critic" of the boat and seines of the United States schooners "Argonaut" and "Col. J. H. French." The vessels escaped. The number of official visits to United States fishing vessels by the Dominion cruisers during the season of 1887 amounted to 1,345.

The steamer "Lansdowne" was also employed the greater portion of the season in the fisheries protection service in the Bay of Fundy, commencing duty on March 15th last and continuing until October 6th. She also rendered service occasionally in connection with lighthouses and buoys.

In this same year, 1887, Great Britain and the United States, by the Queen and President, named plenipotentiaries to negotiate a treaty with the object of removing the difficulties that had arisen concerning the interpretation of Article 1 of the Convention of 1818. This treaty, February 1888, fell through, the United States Senate refusing to ratify it.

During the season of 1888 the Fisheries Protection Fleet in the Gulf of St. Lawrence and the Atlantic consisted of the following: Dominion Government Steamers: "Acadia," Lieut. Andrew R. Gordon, R.N.; "La Canadienne," Commander Wakeham; "Dream," Capt. Pratt; Schooners, "Advance," Capt. Knowlton; "Critic," Capt. McLaren; "C. H. Tupper," Capt. Quigley; "C. J. Brydges," Capt. Poulhiot; "Vigilant," Capt. Lorway.

This same year the steamer "Cruiser" was purchased by the Department at a cost of $5,000 to perform fisheries protection duties on the Great Lakes, United States fishing vessels being in the habit of poaching in Canadian inland waters.

One of the pioneers of the Dominion Government fleet, the D.G.S., "Napoleon III.," passed off the list at the end of 1890, being wrecked October 18th of that year on a flat rock at the entrance to Little Glace Bay, during a heavy gale.

During the years 1888 and 1889 the prolonged tension over the sea coast fisheries became much relieved, and the duties of the fishery protection fleet lessened, by the adoption of the modus-vivendi, which has remained in force ever since.

February 15th, 1888, the draft of a new Fishery Treaty was signed at Washington by representatives of the Governments of Great Britain and the United States, and at the same time an arrangement was made to provide for a modus-vivendi, which was to operate for a limited period pending the final ratification or refection of the treaty.

Under this modus-vivendi fishing vessels of the United States were allowed to purchase bait, ice, seines, lines, and all other supplies and outfits, to tranship their catch, and to ship crews in ports of Canada and Newfoundland upon the payment of the fee of $1.50 per ton of the vessels' registered tonnage.

During 1888, thirty-six of these licenses were granted, the charge being $3,831.; in 1889, seventy-eight, costing $9,589; in 1890, 119, costing $14,461; in 1891, ninety-eight, costing $11,098; in 1892, 108, costing $13,410 and in 1893, seventy-one, costing $9,131. During the year 1903 ninety-three United States fishing vessels, which paid fees aggregating $10,365.40, were licensed; and during 1904, eighty licenses were issued, the fees thereon amounting to $9,205.50.

In 1889 the officers of the fisheries protective service cruisers were authorized to issue the licenses to United States vessels, thus saving the latter the trouble of putting into port. The fleet this year consisted of the Dominion Government Steamers: "Acadia," Lieut. Gordon, R.N.; "La Canadienne," Commander Wakeham; "Stanley," Capt. McLaren; "Cruiser," Capt. Holmes; Steamer "Dream," (chartered), Capt. H. J. H. Pratt; Schooner "Vigilant," Capt. C. F. Knowlton; Schooner "Critic," (chartered), Capt. J. H. Poulhiot.

It will be observed that this year, the fleet consisted of a large majority of steam vessels, only two sailing cruisers being in commission. And so it has remained. In 1903 the fisheries protection fleet consisted of the following, the whole under the command of Commander O. G. V. Spain, R.N.: Dominion Government Steamers: "La Canadienne," Commander W. Wakeham; "Curlew," Capt. J. H. Pratt; "Lady Laurier," Capt. Johnson; "Constance," Capt. G. M. May; "Petrel," Capt. E. Dunn (Lake Erie); "Kestrel," Capt. H. Newcombe (British Columbia); Schooners, "Osprey," Capt. C. T. Knowlton; "Kingfisher," Capt. W. H. Kent.

In addition to the above vessels, four steam patrol launches were used in the protection of our coastal waters. These patrol boats were manned and directed by the crews of the "Curlew," "Kingfisher" and "Osprey." One of them, the "Brant," was specially engaged around the Prince Edward Island coast at the disposal of the Marine and Fisheries officers at Charlottetown. The other patrols rendered valuable services to the larger cruisers in the Bay of Fundy and elsewhere, often surprising poachers where bigger vessels would have attracted notice.

During 1905 the fisheries protection fleet consisted of the Dominion Government Steamers: "Canada," Capt. C. T. Knowlton; "Vigilant," Capt. Dunn (Lake Erie); "La Canadienne," Commander Wakeham; "Curlew," Capt. J. H. Pratt; "Kestrel," Capt. H. Newcombe (British Columbia); "Constance," Capt. May; "Petrel," Capt. Kent.

Of the above vessels the "Constance," although maintained by the Department of Marine and Fisheries, is, and has been for some years, in the customs preventative service. She has had some stirring escapades on this service, particularly in breaking up the trade in liquors smuggled into the St. Lawrence from the French Islands of St. Pierre Miquelon. In July, 1892, she for twenty days carried a detachment of B. Battery R.C.A., under an officer, in addition to her crew. From August 9th, until October the same year, she carried a smaller detachment from the same corps.

The increase in the Dominion Government steam fleet during the past nine years has been quite considerable, the additions since 1896 being as follows: "Minto," built in 1898, winter service; "Brant," built in 1898, lighthouse and buoy service; "Druid," to replace the old "Druid," built in 1901-02, buoy service below Quebec on St. Lawrence River; "Lady Laurier," to replace the "Newfield" (wrecked), built 1901-02, lighthouse and coast service, Nova Scotia; "Shamrock," bought 1899, buoy service between Montreal and Quebec on the St. Lawrence River; "Scout," rebuilt 1902, buoy service between Montreal and Kingston; "Kestrel," built in 1901, fishery protection service, British Columbia; "Georgia," built in 1901, fishery protection service, British Columbia; "Bayfield," (formerly the "Lord Stanley") bought 1901, hydrographic survey, Lake Superior; "Gulnare," bought 1902, tidal survey, Gulf St. Lawrence; "Victor," bought 1903, lighthouse and buoy service, St. Lawrence River; "Maisonneuve," bought 1903, patrol steamer, St. Lawrence River; "Reserve," bought 1903, for sweeping channel above Montreal, and buoy service; "Arctic," bought 1904, Hudson Bay Service; "Canada," built 1904, fishery protection service; "Vigilant," built 1904, (Lake Erie); "Montcalm," ice service, built 1904; "Champlain," ice service, built 1904.

In the year 1883-84 the cost of maintaining the Dominion steamers of the Marine Branch was $122,816.25; in 1893-94, $142,487.42; in 1898-99, $145,270.75; in 1903-04, $306,171.01.

For a short time a vessel of the Royal Navy was borne upon the list of the Dominion Government fleet. In the Speech from the Throne at the opening of the Parliamentary session of 1881, His Excellency the Governor-General announced :

"I have the gratification of informing you that Her Majesty's Government has generously presented to Canada for training school

purposes the steam corvette 'Charybdis," lately returned from service in the Chinese seas."

The Department of Marine and Fisheries shortly afterwards sent a navigating crew to England to bring the "Charybdis" to Canada, and she arrived safely at St. John, N.B., where she was moored. She was a steam, wooden corvette of seventeen guns and 1,500 tons, her engines developing 400 nominal horse-power. The government had no developed plan as to the organization of a training service, she became a white elephant on the hands of the Department and the butt o much ironical criticism. Eventually permission was obtained to dispose of her and she was broken up. For many years the question of providing technical instruction for the youth of Canada desirous of taking up nautical careers remained in abeyance; but a practical start towards the accomplishment of this object has been made by the present Minister of Marine and Fisheries.

During the winter 1902-03, a Marine School was established in the Monument National, at Montreal, through local enterprise The method of tuition and the success met with were so gratifying that the government granted a subsidy of $500, towards the maintenance of that school In that amount the professor's salary was included, also rent of room, lighting, heating and the supplies of various articles necessary for demonstration and instruction.

In 1903-04, the Honourable Mr. Prefontaine authorized the opening of four other schools at Halifax, St. John, Yarmouth and Victoria under the direct supervision of the Department. The examiners of masters and mates at the above cities were appointed professors of those schools at a salary of $250 per annum. A superintendent was also appointed at a similar salary, whose work was to prepare lectures and issue general instructions as to the method of tuition.

In Parliament during the session of 1905, in connection with a debate on a vote of $7,000 for these schools, the Minister stated that he would like to have more of these schools, because we lack marine officers for our shipping. In the inland waters we have sufficient mariners, but for sea-going vessels we have not the number of qualified officers we should have, and it was to induce our young men to embrace this profession that these schools were established. The Minister proceeded to explain that the course at these schools consists more of a series of public lectures than a regular course. The Department had not yet reached the point of making these schools a regular course of study. They are a preparatory course to encourage young men who desire to learn the first principles of the profession that they intend to embrace. Then, when they get a chance, they take positions on board steamers or sailing vessels, which positions they are able to fill, with the knowledge they have gathered in these schools, which are established on the same principle as the night schools for the laboring classes. If the men attending these schools are found by the professors to be good scholars and have talents for navigation, the professors aid them to get places on vessels.

The Minister intimated that when the organization of a Naval Reserve or Militia comes to be taken up, the question of establishing these schools on a more efficient basis will be considered.

The commanders of the Dominion Fisheries Protection Fleet up to the present have been as follows:—

Commander P. A. Scott, R.N., appointed November, 1869, superannuated September 25th, 1888.

Lieutenant Andrew R. Gordon, R.N., appointed October 14th, 1891, died March 24th, 1893. Lieutenant Gordon also held an appointment in the Meteorological Department from August 1st, 1880, to October 14th, 1891.

Commander O. G. V. Spain, R.N., appointed in June, 1893. The present commander.

Commander Spain, besides commanding the Fisheries Protection Fleet, has had conferred upon him the title, "Commanding the Marine Service of Canada," so that he has the whole Dominion Government fleet under his command. He is also Wreck Commissioner for Canada.

For several years prior to assuming command of the Fisheries Protection Fleet, Commander Spain (then Lieutenant) had command of the cruiser "Acadia," the flagship of the fleet. Lieutenant Gordon, the commanding officer, at this period issued his instructions from his office at Ottawa, the directions as to their immediate execution being issued at first by Commander Wakeham, and later by his successor, Lieutenant Spain, from on board the "Acadia."

All captains of the Fisheries Protection Service are also fishery officers, with power of a justice of the peace for all purposes of the Fisheries Act. For the year 1892 they were as follows:—Lieutenant O. V. Spain, R.N., of the "Acadia;" Captain S. Belanger, of the "La Canadienne;" Captain A. Finlayson, of the "Stanley;" Captain J. H. Pratt, of the "Curlew;" Captain Geo. M. May, of the "Constance;" Captain C. T. Knowlton, of the schooner "Vigilant," and Captain W. H. Kent, of the schooner, "Kingfisher."

Besides the above named the following were also appointed fishery officers:—Captain Charles Koeing, of the "Alert," for Province of Quebec; Captain Caleb A. Atkins, of the "Newfield," for Province of Nova Scotia; Capt. Chas. T. Daykin, of the "Landsdowne," for Province of New Brunswick; Captain Alex. M. Macgregor, of the "Bayfield," for Province of Ontario.

Up to the end of 1893 there were always some chartered vessels in the Fisheries Protection Fleet, the last chartered cruiser, the schooner

"Kingfisher," being purchased by the Department at the time mentioned, so that Commander Spain is the first commanding officer of the Canadian fleet to have a purely government-owned squadron under his command.

From his experience in the service before assuming the responsible command, Commander Spain obtained an intimate knowledge of the circumstances of the officers of the government ships which he has been able to turn to the practical advantage of the service.

At the conclusion of the first year of his command the Government agreed to grant half pay during the winter months to the officers. In his report for the year (1893) Commander Spain expressed his gratitude for this provision, and asked that something be done for the men, writing:

"The granting of half-pay to the officers of the Fisheries Protection Service during the winter months, when the vessels have to be laid up, has proved very beneficial to the service. Instead of probably getting nearly all new officers every year, the old ones, who are beginning to understand the necessary drill and discipline requisite on board an armed government vessel, return. The liberality of the government was very much appreciated by these officers.

"Good men are also extremely difficult to get about June, when most of the vessels commission. If some system could be adopted whereby three or four of the best men, at any rate, in each ship could be retained during the winter, it would be a great benefit to the service. At the present time, at the end of the commission, the men are all beginning to get really smart and well set up, and well-drilled in the various exercises with the rifle and the cutlass, and the movements on the march. Then we lose them all, and have to begin with nearly all green hands in the following spring, whereas if three or four of the best hands were retained from each ship, and they distributed in the spring, they would be of immence assistance in getting the remainder of the men into proper order."

In his report for 1894 Commander Spain explained that a provision had been made to encourage men to enlist for a second year and ventured to draw attention to the possibility of using the crews of the fleet as the nucleus for a naval reserve or militia. He wrote upon this occasion:—

"In former reports I have respectfully drawn attention to the fact of the great importance of retaining our good men, more especially as the service is regularly accepted everywhere as of vital necessity to the well-being of our fishermen. This year I have been enabled to draft a certain number of men into the Government ships which remain in commission, and consequently I hope to be enabled to start with a few old and more or less experienced men next spring. In former years we have been very much handicapped for the reason that just as they are getting accustomed to the absolutely necessary strict discipline on board an armed government vessel, the time for paying off comes. The men, however, much they would wish to come back themselves, are unable to remain idle all the winter, and, consequently, we seldom see any of them in the following spring.

"I have instituted a plan that helps me considerably, that is, to allow fifty cents a month more, in addition to their regular wages, to the second period men. The men themselves are capital. They are, as a rule, smart, active fellows, regular sailors; were brought up to the life since they were seven or eight years old, and we have the material round our coast for building up a grand naval reserve if the opportunity could be given. This force of men would be of invaluable assistance in time of necessity."

Commander Spain has always been enthusiastic in his praise of the seaman-like qualities of the men under his command. In his report of the operations of the Fishery Protection Fleet during the season 1895 he wrote:—

"I have to tender my thanks to the captains, officers and men of the Protection Service for the great help they have afforded me in protecting our shores against depredations by foreign poachers, a work of constant worry, and requiring the most careful watching, and level-headed consideration. The men are splendid, and, as I have before pointed out make the best sailors in the world, and if it could be possible to arrive at some scheme by which these men could go through a course of drill in the winter time, when our climate forbids them carrying on their occupations of fishermen, I am sure it would be invaluable for us to have these men to fall back upon in time of dire necessity."

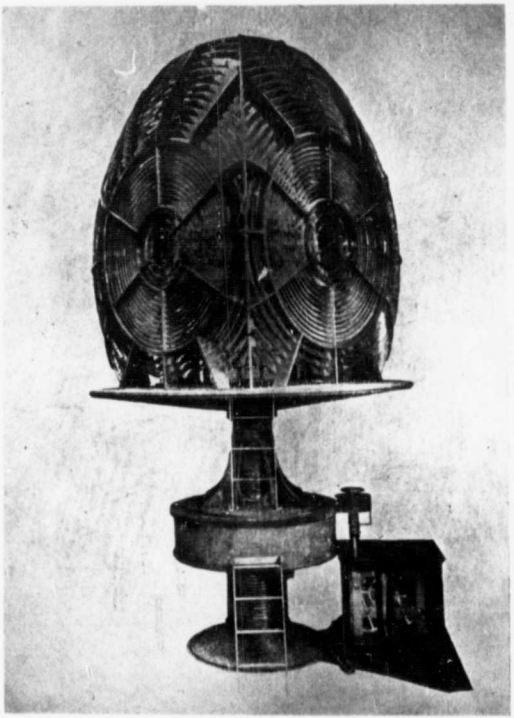
CHAPTER IX.

A Canadian Naval Militia.

THE NECESSITY FOR SUCH AN INSTITUTION.—PREVIOUS NAVAL MILITIA ORGANIZATIONS, AND THEIR SERVICES TO THE COUNTRY IN TIMES OF PERIL.

FEW, if any, of the works undertaken by the present administration of the Dominion, promise to be of greater national importance than the organization of a Naval Militia, which subject has been engaging the attention of the Minister of Marine and Fisheries

BREAKWATER LIGHTHOUSE, PORT COLBORNE, ONT.



FIRST ORDER QUICK FLASHING LIGHT

TYPE OF MODERN HIGH-POWER LIGHTHOUSE APPARATUS NOW BEING INSTALLED

and the specially interested officials of his department, for the last two years.

Except while laboring under the actual stress of war and turmoil, the people of Canada have been too much engrossed with commercial affairs and the development of the natural resources of their vast country to devote any attention to the question of national defence. In the past, the maintenance of the Active Militia has depended upon the personal sacrifices of a few enthusiasts. Attempts to attract general public attention to the subject have generally produced more or less irritation. Latterly more general attention has been devoted to the subject, and the once prevalent idea that commercial pre-eminence meant national security is now generally abandoned, and the palpable fact realized that the increase of the commerce and wealth of a country increases it vulnerability, excites cupidity, and invites attack. In short the world now-a-days appreciates the depth of Virgil's sound philosophy when he penned the line: "The wolf cares not how large the flock is," and likewise that of Solon, who, when, addressing Cræsus, who was displaying to him his treasure, remarked: "Yes, sir, but if another should come with better iron than you he would be master of all this gold."

The shrewdest, coolest-headed business men of the world to-day, realize that the best way to preserve peace is to keep well-prepared for war, and the commercial nations are in the van in the matter of national defence, knowing from the experience of history, that peace rather than war, is the result of physical power.

With her vast shipping interests and large maritime population, it is only possible to account for Canada's neglect to develop her own naval resources by her absolute dependence upon the preponderating power and continued efficiency of the Royal Navy. But that truly splendid organization, even at the time of its very greatest superiority, namely in 1812, had such tremendous claims upon it that it was unable to maintain the most efficient classes of vessels in American waters, and it was then glad to draw recruits for its crews on the ocean from the sailors and fishermen of Nova Scotia, New Brunswick, Quebec and Prince Edward Island.

Such demands may be made upon our sea-faring population in case of emergency again, and if Canada can in future, provide, instead of raw material, men trained to some extent in gunnery, and other naval duties, so much the better for the Royal Navy and the coasts it assists to protect.

Perhaps the most important duty of a Canadian naval militia force would be to assist in the defence of the Great Lakes, the canals and other inland water-ways. Conditions of navigation in Canada's inland waterways are peculiar, requiring much local knowledge and special experience. Militia companies of steamboatmen, raftsmen, lumbermen, fishermen, yachtsmen and bargemen, with enough training to give them a good idea of gunnery and marksmanship, and besides some knowledge of discipline, signalling and other elementary naval duties, would be found invaluable aids in the defence of Canada against either border marauders or regular invasion.

In reading the reports of the Confederation debates one can hardly fail being struck with the importance there attached to the value of the Confederation of the Provinces from the point of view of national defence. And the formation of a powerful naval militia in Canada was anticipated by the Fathers of Confederation.

For instance we find the Hon. George E. (later Sir George) Cartier, in the course of his speech at Quebec, remarking:

"In the event of the Lower Provinces being threatened, we can send the large militia forces of Upper Canada to their rescue. Should we have to fight on our lakes against a foreign foe, we will have the hardy seamen of the Lower Provinces coming to our assistance and manning our vessels."

And the Honorable George Brown in the course of his great speech during the same debate remarked:

"By the census of 1861, it appears that the numbers of sailors and fishermen were then: In Canada, 5,958; in Nova Scotia, 19,637; in New Brunswick, 2,765, and in Prince Edward Island, 38,578; total, 68,256.

"Whether regarded merely as a lucrative branch of industry, or as affecting our maritime position before the world, or as a bulwark of defence in time of need, this one fact that British America will have a combined force of seventy thousand seamen, appears to me an immense argument in favour of the Union." (Hear, Hear.)

According to the convention of 1817 between Great Britain and the United States merely a nominal armed force can be kept afloat on the Great Lakes, but that has not prevented the United States Government from acting with prudence and forethought, and making provision for the naval training of their lake-faring population, and very efficient naval militia corps have been established, and are well maintained, at Buffalo, Detroit, Cleveland, Chicago and other lake ports.

Canada has been doing nothing in this respect notwithstanding the fact that many eminent authorities have expressed their opinion as to the vital importance of the command of the lakes in any scheme of national defence. For instance the great Duke of Wellington in a letter to Sir George Murray, December 22nd, 1814, wrote:

"I have told Ministers repeatedly that a naval superiority on the Lakes is a sine-qua-non of success in war on the frontiers of

Canada, even if our object should be wholly defensive." (Gurwood XIV., 244.)

Sir Archibald Allison (History of Europe, Chap. XCI.) referring to the war of 1812-14 wrote:

"The last war has clearly demonstrated that the command of the lakes is decisive of a campaign on the Canadian frontier, and that, without it, the best-laid plans of defence may fail; and Wellington has recorded his decided opinion, that on a due ascendancy on the inland waters, the success of every contest between the British and Americans in that quarter is entirely dependent. The two great discomfitures sustained at land in our North American possession—the defeat of Proctor at the Moravian village, and the retreat of Prevost from Plattsburg—were the immediate consequences of the disasters on Lake Erie and Lake Champlain. The movement of Chauncey (from Sackett's Harbor in 1813) gained the ascendancy on Lake Ontario. Toronto was taken; and a serious invasion, which was arrested only by the heroism at Chippewa, was commenced. Knowing then, where the danger lies, and where the means of averting it are to be found, it is the duty of the British Government to be at all times prepared for hostilities, and in an especial manner ready at a moment's warning to equip or prepare a formidable naval force alike on Champlain, Erie and Ontario. * * *.

"In consequence, preparation and foresight are more imperatively required on the English than on the American part. And let it be recollected that early success, important in all wars, will probably prove decisive in the next contest with America, from the ardent passion which it will awaken in their democratic community, and the wide extent of defenceless shores which a superiority on the lakes will at once expose to their incursions."

Dr. W. H. Russell, the famous war correspondent, while in Canada at the time of the "Trent Affair" was impressed with the importance of defending the waterways, and he wrote in his volume: "Canada, its Defences, Resources, etc:"—

"Some steps should be taken to develop naval and marine companies in the passes along the shores of the lakes. The importance of having trained sailors and gunners stationed just where they are wanted cannot be exaggerated, but it is not very likely that Brigade Majors will look after such a force."

This last reference was of course to the plan then, and until a few months ago followed, of entrusting the development of the Dominion's naval resources to the Militia Department.

Dr. Russell, proceeding to a review of the defensible condition of Canada, pointed out that "the best guarantee against invasion would be complete naval supremacy on the lakes and rivers, because they constitute the most accessible roads for the invaders, and the most serviceable barriers for defenders if they have the proper means of defence. To give any chance of successful resistance, some equality of naval force on the part of the invaded, is almost indispensable. * * * To prevent the enemy clearing all before them on the lakes by an energetic naval sortie from their ports, it would be necessary to have the means of furnishing a flotilla as soon as hostilities became imminent, and to watch every point, particularly such as that of Sorel, where communication from the Richelieu to the St. Lawrence might be interrupted. * * * Gunboats on Lake St. Louis would prove most valuable in defending Montreal."

The convention of 1817 is responsible for the absence of a naval force on the lakes; it cannot altogether account for the the failure to provide, along the lake shore, a force of trained men, ready to man a lake flotilla in case of emergency, and the utter neglect of the naval training of the hardy sea-going population of the maritime provinces.

The continued disregard by Canada of her naval resources is remarkable when it is recalled that the Provincial Marine forces of the colony in its infancy were the pioneers of the country's flourishing mercantile marine, particularly inland. And this neglect seems all the more singular when there is called to mind the invaluable services rendered to the country by previous Canadian naval organizations in times of war and national peril.

An excellent account of the first vessels which traversed Lake Ontario a hundred and forty years ago may be found in M. Pouchot's "Memoir upon the late war in North America between the French and English, 1755-60," which was translated and edited by F. B. Hough and published at Roxbury, Mass. In it we find that when the French troops arrived in Canada they were transported "in batteaux for Montreal." (Vol. 1, p. 36) these batteaux were the boats used for transportation in those early days. In the carriage of freight they would take about three tons, and in conveying troops would probably accommodate about twenty-five or thirty men. Pouchot writes:

"The batteaux used for the navigation of this upper part of this river carry 6,000 pounds, and are of peculiar form to enable them to resist the efforts made to take them up the rapids. Those that the English built at the latter place (Montreal) were larger and lighter, but could not endure this navigation after the first voyages. They were always filled with water by the efforts made to keep them up, and those of the French did much better service. The English did not furnish their batteaux with sails, which are very essential on good occasions, but they provided good oars, while the French used those

of pine, which were poor, badly made, and used up in great numbers."

He further states that in 1755 the regiments of Guienne and Bearn left on July 19th for Frontenac (now Kingston). They embarked at Lachine in batteaux laden with provisions.

When it was determined by the British, in connection with their general campaign of the same year, to attack Fort Niagara, it was resolved that the officer in command of the force "should receive a sufficient number of batteaux to transport his troops and artillery by way of Lake Ontario."

The troops referred to arrived at Oswego, but sickness "prevented the execution of their designs," so that awaiting further movements they also "undertook to build vessels to form a fleet upon the lake."

The fleet fitted out by the English at Oswego in 1775 consisted of a decked sloop of eight four-pounders and thirty swivels, a decked schooner of eighty four-pounders and twenty-eight swivels, an undecked schooner of fourteen swivels and fourteen oars, and another of twelve swivels and fourteen oars. All of these were unrigged and laid up early in the fall. The undecked schooner described as carrying fourteen swivels was the first large vessel flying the British flag ever afloat on Lake Ontario. She had a forty foot keel, and was made to row when necessary.

At the surrender of Oswego in August, 1756, the French found quite a large ship-building yard "with nine vessels of war, of which one, carrying eighteen guns, was finished. The others were upon the stocks and all their rigging was in the magazines."

During the spring of 1757 a party of French soldiers descended on Fort George "to surprise it, but being discovered they contented themselves with burning a saw mill and some batteaux." A foot note says there were 159 batteaux, with four brigantines and two galleys, each of fifty oars, "without reckoning much wood for construction," and at Fort William Henry on March 18th, the French destroyed 350 batteaux and four armed brigantines." Mante states that store houses were burned, with "all the huts of the Rangers and a sloop on the stocks," and on the side of the enemy, Volf, a German officer, came to burn a vessel upon the stocks near Fort Niagara."

The principal object the British commanders had in view in 1758, when Col. Bradstreet was despatched to Frontenac, was to destroy the entrepot of the French marine on Lake Ontario, there located. The victors, after the reduction of the place, captured, besides a quantity of military stores, nine armed barques, including the vessels taken at Oswego. Before withdrawing across the lakes, Bradstreet submitted seven of the captured vessels to the flames. So much was this expedition, by destroying the naval depot at Frontenac, considered to imperil the superiority of the French in Upper Canada, that a general call to arms was ordered throughout New France. The reduction of Fort Niagara at the upper end of Lake Ontario was thereafter a foregone conclusion. Early the following spring Captain Pouchot was despatched to Niagara with reinforcements and some war vessels, including two corvettes of ten guns each, which were built during the winter at Fort Presentation (Ogdensburg). But it was impossible to repair the loss sustained at Frontenac and Niagara.

In writing of the attack on Oswego in 1760 Pouchot says: "The English had built five great batteaux, of thirteen oars on each side with a cannon at the end," and an Indian reported that while fishing in the Bay of Cataracoui he saw two English vessels, which were anchored near Little Cataracoui," and that "the great vessel had three decks and ten guns on each side."

Cataracoui was Kingston harbor. The "Iroquois" and the "Outaouaise" were the names of two armed vessels which did great service for the French on Lake Ontario, but finally fell into the hands of the English. Two other vessels were the "Seneca," of twenty-two cannon, and the "Oneida," of eighteen cannon. These vessels were named by Knox, the historian, the "Onondaga" and the "Mohawk."

On a map in the British Museum it is stated that the French had on the St. Lawrence and Lake Ontario in 1757 four government vessels, "La Marquise de Vaudreuil," "La Louise," "Le Victort" and "La Huzalt." The "Marquise de Vaudreuil," and "Huzalt" were top-sail schooners of sixteen and fourteen guns respectively, the "Louise" a schooner of ten guns and the "Victort" a sloop of eight guns.

According to the same authority the British flotilla on Lake Ontario and the Upper St. Lawrence at the same time included the following vessels: "Montcalm" (captured from the French), "George," "Lively," "Vigilant," "Ontario," and another, the name of which is unrecognizable. Judging from the pictures on the map mentioned, the "Montcalm" was a brig of twenty guns, the "George" one of eighteen, the vessel with the undistinguishable name, a top-sail schooner of twelve; the "Vigilant," a sloop of twelve guns, the "Ontario" one of ten guns.

During the years immediately following the conquest, the vessels afloat in the Canadian inland waters were all armed as a protection against the Indians, and maintained as a part of the Colonial military establishment. During the years preceeing the revolutionary war, this provincial marine force was strengthened to some extent.

Montgomery's force captured several of the government vessels in the Richelieu and the St. Lawrence.

Carleton, after driving the Continentals from the frontiers of Canada

in 1776, judging that the next important step to be taken was to secure British mastery on Lake Champlain, set about launching a flotilla on it for that purpose. Three armed vessels, the parts of which were sent from England, were put together; while twenty gunboats and other small craft, were collected or built, and the whole put in charge of Captain Pringle of the Royal Navy. The Continentals, on their part, armed two corvettes, two brigantines and a dozen smaller vessels, which were put in charge of Benedict Arnold, with directions to obtain control of the lake if he could. The two flotillas met October 11th, Arnold losing two vessels in the encounter, and being then inferior to the British, he decided to take shelter under the guns of Crown Point. But intercepted on his way thither, two days afterwards, by the British flotilla, a second action took place, when he was completely defeated, and all his vessels taken or destroyed but four. The British flotilla included the "Inflexible," flagship, a ship of 300 tons, eighteen guns; schooner "Maria," fourteen guns; schooner "Carleton," twelve guns; floating battery "Thunderer," eighteen guns; a row galley of seven guns and twenty gun boats of one gun each. A large proportion of the crews were drafted from the British men-of-war at Quebec, the remainder consisting of Canadians, chiefly officers and men of the provincial marine. The Continental land force, thereby left unprotected at Crown Point, blew up the fort, and retreated up the lake.

In the collections of Carleton and Haldimand papers in the Dominion Archives are many documents showing the great value placed upon the lake armaments by the early British governors of Canada.

June 21st, 1778, during the war of the American Revolution, General Haldimand wrote to Captain Douglas of the Royal Navy, commanding on this station, asking that Messrs. Schank, Brownell, Chambers and Blacket of the Royal Navy may receive permission to serve on the lakes to replace officers who were leaving. The same day the Governor wrote to Lord Sandwich recommending Lieutenants Schank and Chambers[1] and other officers for promotion, as an inducement for them to serve on the lakes, as the want of such inducement would prevent suitable officers giving their services on this important duty.

It appears to have been as difficult to procure satisfactory seamen to man the lake marine in those days as it was to obtain qualified officers. September 7th, 1778, the Governor wrote Lieut.-Governor Cramahe to sound Captain Laforce, who was engaged in the Colonial mercantile marine, to ascertain if he and Canadian crews would serve on Lake Champlain. Meantime instructions were given to engage as many British seamen as possible.

Captain Laforce appears to have been ready to accept government employ, for shortly afterwards his name appeared among those of the officers of the Provincial Marine.

September 17th, 1778, Secretary Foy, writing to Captain Chambers commanding the flotilla on Lake Champlain, gave him permission to examine into the report that there were a large number of idle seamen at Montreal, and if correct to impress them for service on the lakes. Captain Chambers was instructed to place soldiers on his advanced vessels, and to refuse to recognize any orders from the officers of the Royal Navy on the seaboard, for the return of any of their sailors serving on the lakes, to their ships.

At this time friction appears to have developed between the naval officers serving on His Majesty's ships on the seaboard, and the military authorities, respecting the lake marine, which was really an adjunct of the military establishment. Captain Pearson, R.N., who in the autumn of 1778 had refused to leave a naval force in the St. Lawrence for the winter, as requested by Governor Haldimand, wrote to the naval officers on the lakes for returns regarding the forces under their command. October 12th, Governor Haldimand wrote from Sorel to Captain Chambers that no returns were to be made to Captain Pearson relative to vessels on the lakes. November 30th, the Governor again wrote to Captain Chambers to the effect that "returns of the seamen from the Royal Navy serving on Lake Champlain may be sent to the naval officer in the St. Lawrence." (Dominion Archives.)

Upon the conclusion of peace the "Naval Department" or lake marine was greatly reduced, and what was left of personel and stores transferred to the Quartermaster-General.

While the details of the "Constitutional Act" were under discussion, Governor Carleton, in 1790, urged the British Government to provide for the better regulation of the Canadian militia. A memorandum

(1) John Schank was born in Scotland in 1740 and went to sea in the Royal Navy when young. In the war of the revolution he built and commanded the "Inflexible" of eighteen guns and fought her on Lake Champlain in October, 1776. Many of her timbers had been growing in the forests only ten days before the battle. His experience on the lakes impressed his mind with the importance of designing shallow draught vessels which would work to windward under sail. He appears to have been the inventor of the centre board, for in 1793 he published a "treatise on a method invented by him of navigating sailing vessels in shallow water by means of sliding keels." He died an admiral.

Thomas Chambers belonged to the old English family of that name, a branch of which has for several generations resided in Scotland. He was born in Warwickshire and served in Admiral Saunder's fleet at the siege and capture of Quebec in 1759. He participated with great distinction in all the fighting on Lake Champlain during the Revolutionary War, and in June 1778, was appointed to the command of the flotilla on that lake, retaining the command up to the termination of the war. He died a rear-admiral.

on the subject by Carleton contained a series of six requirements, the last of the series being as follows:

"Note 6,—The establishment of Regulations for the punishment of offences committed by the officers and crews of the King's vessels, navigating the lakes, including such as may navigate the River and Gulf of St. Lawrence, under Provincial Commissions.

"For the want of such Regulations the Ringleaders of a Conspiracy to desert entirely from one of the King's vessels, have escaped punishment and only been dismissed the service.

"See No. 90 to Lord Sydney of the 4th November, 1788."

The Colonial Secretary returned an observation on this note in the following terms:

"This must be submitted to the Admiralty as far as it affects their jurisdiction, who may in consequence constitute an Admiralty Court for the Trial of Offences committed on what shall be deemed the High Seas. All others come under the Supreme Court of the Province.

"I have communicated the subject of Your Lordship's 6th suggestion to the Lords Commissioners of the Admiralty, as all offences committed on what may be deemed the High Seas are cognizable only by a Court of Admiralty, constituted by their Lordships. All other offences will be subject to the jurisdiction of the Supreme Court constituted in the manner I have already alluded to.

"The want of due discipline with respect to the provincial naval department noted by Your Lordship in the 6th suggestion has been likewise mentioned to me by Lieut.-Governor Simcoe in his letter of the 4th of November last, an Extract of which, as far as it relates to that subject, I now enclose to Your Lordship. It is certainly highly necessary that some coercive regulations should be adopted with respect to so important a portion of the strength of the country as the naval force upon the Lakes and in the River and Gulph of St. Lawrence.

"With this view it seems advisable that Your Lordship should consult the several Judges and also the Crown Lawyers of the Provinces of Upper and Lower Canada, as to the mode by which in their judgment such Regulations may be enforced as Your Lordship shall upon communication with Lieut.-Governor Simcoe think it expedient to admit and transmit for the information of His Majesty their opinion of the mode which it might be best to adopt for legalizing and enforcing such regulations. In the meanwhile I have no doubt but that the orders and directions which will be given by Your Lordship, with the prompt and vigilant attention of Lieut.-Governor Simcoe to the conduct of both the men and officers in the naval Department in Upper Canada, will check the evil now complained of until those persons shall be made more decidedly amenable to Military Discipline."

According to the Military Register of the two provinces of Upper and Lower Canada of 1779, there was attached to the General staff in Canada united "Deputy Quarter Master Generals and Marine Departments." The personel of these departments was given together in the army lists as follows:

"Deputy Quarter-Master Generals and Marine Departments. Lieut.-Col. John Barnes, Deputy Quarter-Master General; Lieut. John Bromhead, Asst.-Deputy Quarter-Master General. Superintending the Transport, the Sub-Officer comdg. at Fort Chipewa; Masters and commanders, Alex. Grant, Senior Officer; J. B. Bouchette[2] do; Lieuts. David Cowan; P. M. Fortier, Lieuts. and Mates, Thos. Paxton, and James Fleet."

The British authorities showed considerable activity in constructing and maintaining a flotilla on the Upper St. Lawrence and Lake Ontario during the Revolutionary War, a dock yard being established at Carleton Island. Of the vessels built there at this period one of the largest appears to have been the "Ontario," which was pierced for and carried twenty-two guns. She was under the command of Capt. Andrews, of the Royal Navy. This officer was also the first commissioner at the dock yard, besides being the commodore of the small fleet, which was maintained upon the lake, principally for the conveyance of troops and stores for their use. Some time between the years 1780 and 1783 —there was some dispute as to the exact year, but the former date

2 Captain Jean Baptiste Bouchette acquired very considerable celebrity during the "Continental" invasion of Canada in 1775, being fortunate enough to contribute in a marked way towards the preservation of Canada to the British Crown. In November, when the Continental army entered Montreal, Bouchette was in command of a brigantine named "Gaspe" then lying in the harbor. Sir Guy Carleton, who had escaped from Montreal before the surrender, was a fugitive, and in momentary danger of falling into the hands of the enemy. Quebec, poorly provisioned, and with a feeble garrison, was the only place which could hope to resist the invaders, and there was little hope of saving this last foothold of British power in the province without some ammunition saved from Montreal could be got there, and without the Governor could reach there to organize and conduct the defence. His capture would have meant disaster. The revolutionists, however, were masters of the St. Lawrence and the neighboring parishes as far down as Lake St. Peter, and that was the only route open to Quebec. In this contingency Captain Bouchette, brave, determined and full of resource, offered to conduct the Governor safely to Quebec. Carleton assumed the disguise of a canoeman, a light bark canoe was secured, the pair, accompanied by the Chevalier de Niverville, started on their perilous journey down the river, and managed to pass by, in the dark of night, with muffled paddles, the American vessels which were patrolling the river. After many adventures and hair-breadth escapes, the Governor and his escort reached Quebec in safety, but barely in time to make hasty preparations to defend the place and to revive the courage of the despondent citizens and of the small garrison. Thanks to Bouchette's arrangements the much-needed ammunition was also safely transported through the revolutionary forces to Quebec.

FOG ALARM STATION, LOUISBURG, N.S.

appears the more probable—whilst the "Ontario" was proceeding from Niagara to Oswego, having on board, in addition to her crew, a detachment of the King's Regiment under the command of Colonel Burton, she encountered a fearful storm, and her gallant commander and all under his charge were lost. No less than one hundred and seventy-two persons perished on this occasion.

In 1788 a survey of all the lake marine force was made by Deputy Surveyor General Collins, acting under instructions received from Lord Dorchestor, the then Governor of Canada.

The Government at this time had ship-building yards at Murney's and at Navy Points. Among the vessels constructed there was the "Speedy" schooner, besides the "Mohawk," "Mississaga" and "Duke of Kent," all vessels whose names are still remembered about Lake Ontario.

Most of the early commanders of ships plying upon the lakes belonged to the Royal Navy or Provincial Marine. Among them were Captains Earle, Fortiche, McKenzie, Richardson, Steele and Paxton. Captain J. B. Bouchette had in 1793 the entire command of the naval force on Lake Ontario.

In June, 1795, General Simcoe, the pioneer governor of Upper Canada was at Navy Hall, Newark, and there was visited by the famous French traveler, the Duke of Rochefoucault de Liancourt. In the published diary of that nobleman he remarks:

"Captain Bouchette commands the naval force of Lake Ontario, and is at the head of all the marine establishments, yet without the least power in money matters. This gentleman possesses the confidence both of Lord Dorchester and Governor Simcoe; he is a Canadian by birth, but entered the British service when Canada fell into the power of England. * * * In regard to the pay of the Royal Marine force on Lake Ontario, a captain has ten shillings a day, a lieutennat six, and a second lieutenant three shillings and six pence. The seamen's wages are eight dollars per month. The masters of merchantmen have twenty-five dollars and the sailors from nine to ten dollars a month."

The government at this period appears to have kept itself systematically informed of the condition of the mercantile shipping on the lakes, and the vessels were surveyed with a view to utilizing them in case of emergency as auxiliaries to the regular force of armed vessels of the provincial marine, a sort of naval militia scheme. The following return for 1780 is interesting, not alone as showing the extent of the Canadian lake mercantile marine at the close of the last century, but as indicating the steps taken to extend the naval militia force upon the lakes in case of emergency:

Lakes.	Name and Build.	Owner.	Tons.	No. of Guns They Carry If Armed. Four Pounders.	Swivels.
	Sch. Nancy	G. Smith & Co.	67	6	6
	Sloop Sagima	Aikin, Nelldum & Part	67	4	6
Huron	Sloop Detroit	ditto	65	4	6
Erie and	Sloop Beaver	N.W.Co.	45	4	6
Michigan	Sloop Industry	N.W. Co.	25	4	4
	Sloop Speedwell	Jas. Baby	24	4	6
	Sc. Weagel	J. Aikin	16	4	4
	Sc. Swan	J. May	30	4	4
	Sloop Arabaska	N.W. Co.	40	4	6
Superior	Sloop Otter	N.W. Co.	75	..	..
	Sch. Gov. Simcoe		87	8	8
	Sch. Lady Dorchester		87	8	8
Ontario	Sch. York		86	5	6
	Sloop building near Kingston			..	40
	The Polly bldg. near Bay of Quinte		..	..	20

The Provincial Marine proper appears to have deteriorated considerably during the period of peace succeeding the Revolutionary War, and in view of his certainty as to the prospective war with the United States, its unsatisfactory condition early attracted the attention of Colonel (later Major-General) Brock, while stationed at Quebec, and in command of the troops in Canada. He acted promptly, and in November, 1806, Colonel Brock directed that Lieutenant-Colonel Pye, the Deputy Quarter-Master, should have the entire superintendence of the marine department, including the batteaux for the lakes and rivers of the Canadas, the building and outfit of the vessels, their repairs and navigating, and the issue and expenditure of the necessary stores, with the exception only of the batteaux at Lachine. Colonel Brock further directed that an assistant quarter-master general should be

stationed, one at Amherstburg and another at Kingston; the former to superintend the marine service on Lake Erie and its dependencies; and the latter on Lake Ontario and its dependencies; to whom the log books, journals, and all communications were to be transmitted. By the same order, the following number of boats was to be kept in constant repair at the several posts for military services, independent of those required for the commissariat, viz.: Quebec, six; Three Rivers, two; William Henry, one; Montreal, seven; St. Johns, two; Kingston, four; Fort George, twelve; York, three; and Amherstburg, four. Total, forty-one.

Although it may appear strange that a military officer should be nominated to the command in chief of the Canadian navy, yet it would seem that this act of Colonel Brock, together with the wholesome regulations which he issued at the same time and place for the guidance of the deputy quarter-master general, was the principal cause of the British supremacy on the lakes when the war broke out in the year 1812.

Among the Dominion Archives is a trenchant letter from Colonel Brock dated Quebec, June 28th, 1807, addressed to Brevet Major McKenzie of the 41st Regiment at Kingston. This document, as indicating the state of disorganization of the "marine department," and the importance Brock attached to the efficiency of this service, is instructive. He wrote in part :

"When I directed you to assemble a court of inquiry to investigate the causes which had prevented the payment of the marine department, by which it became seven months in arrears, you were furnished with such documents as I considered made it impossible for you to err; but the result of your proceedings is so very unsatisfactory, and gives, throughout, such an appearance of inattention, that I feel myself compelled to desire the court to revive its inquiry, and at the same time to conform strictly to the directions herein contained.

"Captain Frend, in his capacity of assistant deputy quarter-master general, reported officially, on the 2nd of April, that the Marine Department at Kingston was seven months in arrears, and that Mr. Commissary Ross assigned the want of cash as the reason.

"Surprised at such a declaration, and wishing to establish the fact in a regular manner, I directed his last account with Mr. Deputy Commissary-General Gragie, ending the 24th September, 1806, at which time a balance of £160, 2s., 7½d. stood to his credit, to be transmitted to me.

"A list of bills was likewise forwarded, which Mr. Commissary Ross had subsequently drawn up to the 2nd of April, amounting together to £1,327 10s. 6½d.; deducting therefrom the sum of £160 2s. 7½d.; due to Mr. Ross; there remained a balance of £1,167 7s. 10¾d. and I requested he might be called upon to state specifically before the court, in what manner that amount had been applied, so as to leave no money in his hands, with which to pay the marine department. * * *

"Great discontent existed, during my stay in Upper Canada, among the marine department; and now that I possess the power, I am determined, as far as I can, to do it away. This act of justice cannot, however, be accomplished unless the officers in command will give their aid, and report everything of the kind that occurs within their observation.

"Captain Frend is stationed at Kingston for that particular purpose, and much is expected from his intelligence and exertions."

After assuming command in Upper Canada, on the near approach of war, Brock again showed that he appreciated the vital importance of attempting to assure the naval supremacy of the lakes. Writing from York December 2nd, 1811, to Lieut.-General Sir George Prevost, Bart., at Quebec, he said :

"From Amherstburg to Fort Erie, my chief dependence must rest on a naval force for the protection of that extensive coast, but, considering the state to which it is reduced, extraordinary exertions and great expense will be required before it can be rendered efficient. At present, it consists only of a ship and a small schooner,[3] the latter of a bad construction, old, and in want of many repairs; yet she is the only King's vessel able to navigate Lake Huron, whilst the Americans have a sloop, and a fine brig[4] capable of carrying twelve guns, both in perfect readiness for any service. If, consequently, the garrison of St. Joseph's is to be maintained, and an attack on Michilimackinac undertaken, it will be expedient to hire, or purchase from the merchants as many vessels as may be necessary for the purpose. The Americans can resort to the same means, and the construction and number of their vessels for trade will give them great advantage—besides, their small craft, or boats, in which troops could be easily transported, exceed ours considerably; indeed, we have very few of that description. I therefore leave it to Your Excellency's superior judgment to determine whether a sufficient number of gunboats for both lakes, so constructed as to draw little water, ought not to be added to our means of offence and defence. It is worthy of remark, that the only American national vessel on Lake Ontario, built two years ago, and now lying in Sackett's Harbour, remained without seamen until within the last fortnight, when the officers began to enter men as fast as possible. A lieutenant with a party came to Buffalo, a tolerably large village opposite Fort Erie, and procured several hands, but, not satisfied, a petty officer

3 The ship "Queen Charlotte" and schooner "Hunter."
4 This brig was the "Adams," captured at Detroit.

was sent to our side to inveigle others. The magistrates, hearing of this sent to apprehend him; but he escaped with difficulty."

Ever since the Revolutionary War the Provincial Marine service had been regarded more as a means of military, and even civil, transport, rather than as a naval force likely to be called upon to assist in the armed defence of the country. There were a few of the old naval officers still remaining, but most of those in authority were civilians taken into the service from the mercantile marine. There were a few old men-of-war's among the sailors, but the larger proportion of the crews had never been under real naval discipline. So it happened that there was a great lack of discipline and naval training in the Provincial Marine, and no wonder Brock was anxious about the lakes when he regarded the ominous gathering of the war cloud.

The war of 1812-14 abundantly justified Brock's ideas as to the importance of establishing and maintaining a naval superiority on the inland seas which form such a lengthy stretch of the international boundary.

The naval war on the lakes may be said to have antedated the declaration of war, for the Act of Congress declaring war upon Great Britain was passed by the United States Congress on June 18th, 1812.

On June 5th, 1812, the schooner "Lord Nelson" belonging to and owned by James and William Crooks of Niagara, freighted with flour and a general cargo, sailed from that place for Kingston. Being found in United States waters, she was captured by the "Oneida" under the command of Lieut. Woolsey, a capable and gallant officer, and condemned as a prize under the provisions of the Embargo Act. Two other schooners, namely, the "Ontario" and the "Niagara," were in the same month also taken by the Americans. The former was speedily released but the latter was sold by her captors. These acts naturally led to retaliatory tactics being adopted by the Canadians. When the news of the declaration of war reached Ogdensburg on the St. Lawrence there were lying there eight United States trading schooners. They naturally endeavored to escape to the open waters of Lake Ontario, but a company of volunteers, about 50 in number, commanded by an enthusiastic Canadian named Jones, chased them in open boats. They succeeded in capturing two of the fugitive vessels, named the "Sophia" and "Island Queen," and after taking possession of their contents burnt them. This took place near Brockville at the foot of the Thousand Isles. On July 29th, an attempt was made by the British fleet on the lakes to recapture the "Lord Nelson," which was lying under charge of the United States war vessel the "Oneida," in Sackett's Harbor. The attacking forces sailed from Kingston under command of Commodore Earle, who had formerly commanded a government vessel known as the "Toronto Yacht." It consisted of the following vessels: "Royal George," twenty-six guns; "Prince Regent," twenty-six; "Earl of Moira,' twenty; "Simcoe," twelve, and "Seneca," four. The expedition was not successful and was attended by some loss of life and not a little damage to the Canadian ships.

The result was hardly to be wondered at considering the character of the force, for the Canadian vessels were in point of equipment and crews little more than transports, while the "Oneida," although a slow sailor, was a sound and heavily armed man-of-war commanded by as good officers as could be found in the United States Navy and with a thoroughly trained and disciplined crew.

The complete list of the vessels of the Canadian Provincial Marine force at the outbreak of the war appears to have been as follows :

On Lake Ontario, "Royal George," twenty-two guns; "Prince Regent," sixteen; "Earl of Moira," fourteen; "Gloucester," ten; "Seneca,"eight; "Simcoe," eight.

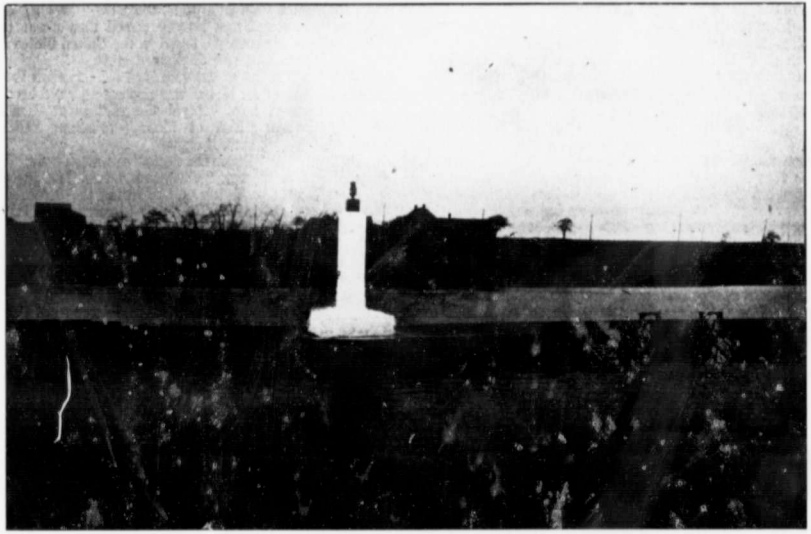
On Lake Erie, "Queen Charlotte," seventeen guns; "Lady Prevost," thirteen; "Hunter," ten; "Little Belt," two; "Chippewa," two.

Immediately preceding and following the declaration of war the United States authorities took active measures to assure themselves the control of Lake Ontario, naval officers and men and a large force of ship builders and riggers being sent to Sackett's Harbor. Several of the captured merchant vessels were taken in hand and armed, others were purchased, and a good makeshift fighting fleet soon produced. Meantime the keels of regular war vessels were laid down. The British also began a building programme, but did not meet with as much success as the enemy. One of the first things done was to add to the armaments of the vessels afloat.

On Lake Erie the United States at first had no naval force, but the military authorities fitted out one vessel as a warship, and named her the "Adams."

In the earlier stages of the war the United States forces on Lake Ontario certainly showed more enterprise than the Canadian, but they were not always successful. On September 16th, 1812, a brigade of boats under convoy of two companies of the Newfoundland Regiment and a detachment of the 49th and Veterans, were attacked by the Americans, about twelve miles below Johnstown. This attack, it seems, did not terminate to the advantage of the assailants, for they lost to the Canadians one of their Durham boats and had more than twenty men killed and wounded.

The Canadian marine service had its share in Brock's glorious achievement at Detroit, August 16th, 1812, the "Queen Charlotte" covering Brock's right when it advanced against the fort, and detachments of both officers and men from the other Provincial Marine ships on Lake Erie asslsted to man Brock's four field guns.



NORTH CHANNEL DYKE LIGHT

TYPE OF PERMANENT STEEL AND CONCRETE GAS LIGHT, MONTREAL–KINGSTON DIVISION

The United States brig "Adams" formed part of the spoils of this victory, was rechristened the "Detroit" and taken on the strength of the Provincial Marine. She was not destined to fly the British flag very long.

On October 9th, the "Detroit" and the North-West Company's brig "Caledonia," of about 100 tons, having arrived the preceding day from Detroit, were surprised, boarded and carried opposite Fort Erie, before the dawn of day, by Lieutenant Elliott of the United States navy, with 100 seamen and soldiers in two large boats. This officer was at this time at Black Rock, superintending the equipment of some schooners, lately purchased for the service of Lake Erie. But for the defensive measures to which Major-General Brock was at this time, by orders, restricted, he would probably have destroyed these very schooners, for whose equipment, as vessels of war, Lieutenant Elliott and fifty seamen had been sent from New York. The two British brigs contained forty prisoners, some cannon and small arms, captured at Detroit, exclusive of a valuable quantity of furs in the "Caledonia." Joined by the prisoners the Americans who boarded numbered 140, and the crews of the two brigs, consisting of militia and Canadian seamen, amounted to sixty-eight. After the capture Lieutenant Elliott succeeded in getting the "Caledonia" close under the batteries at Black Rock, but he was compelled by a few well-directed shots from the Canadian shore and from the "Lady Prevost" to run the "Detroit" upon Squaw Island. Here she was boarded by a subaltern's detachment of H.M. 49th Regiment from Fort Erie, and the Americans, soon after, completed her destruction by setting her on fire.

The United States naval establishments at Sackett' Harbor in the meantime increased with celerity, and the ascendancy of their fleet on Lake Ontario was, by the indefatigable exertions of Commodore Chauncey, now almost established.

With anxieties accumulating on every hand Brock wrote:

"The enemy is making exertion to gain a naval superiority on both lakes, which, if they accomplish it, I do not see how we can possibly retain the country."

A few days later the gallant general met his death on the glorious heights of Queenston.

On November 9th, 1812, a naval encounter between the United States and Canadian fleets took place near Kingston, Commodore Chauncey, of the U.S. Navy, on board the "Oneida," with several other vessels, lying off the "Ducks," on the evening of the previous day, hoping to intercept the Canadian fleet, composed of the "Royal George" of six guns, under the command of Captain Popham, "the Duke of Gloucester," of fourteen guns, and the "Prince Regent," of twenty-two guns, which were returning from Niagara. These vessels reached the Bay of Quinte safely during the night of November 8th, and were proceeding on the following morning on their voyage to Kingston, when Chauncey encountered them. A battle in which the forts participated, and which lasted for more than two hours, ensued, and ended by the Americans retreating to Sackett's Harbor. On their way thitherwards the "Oneida" fell in with the British vessel, the "Earl of Moira," acting as an escort to a sloop which had on board General Brock's plate, books and other private effects. These were all captured, but subsequently, to the honor of Chauncey, restored to the general's representatives. As the United States vessels were returning to Sackett's Harbor they discovered the schooner "Simcoe," under the command of Captain Richardson, trying to make her way into Kingston. They promptly fired into her. Richardson tried first of all to run his vessel on to Amherst Isle; that failed. He then essayed to get into port, but almost as he reached safety, a 32-pounder struck the ship and she sank, the crew firing their only musket as she went down. She was afterwards raised, and sailed for some years longer.

The exertions on the part of the United States to create a powerful fleet on Lake Ontario were redoubled during the winter of 1812-13, and in this effort they were assisted by the turn of affairs in the naval conflict on the ocean. During the earlier stages of the war, the heavily-armed and well-manned frigates of the United States had been unexpectedly successful in single combats with the lighter-armed and, comparatively speaking, inefficiently manned, cruisers of the Royal Navy in American waters. As a result the British Admiralty, stung into activity, by the early reverses, had despatched to the coast of America vessels of a class, and in such strength, as to sweep the sea of the United States cruisers, and compel the best and bravest of their ships and officers to take refuge in their own harbors. In February, 1813, Sir John Borlase Warren, having established a vigilant blockade of the American coasts, intercepted their carrying and coasting trade, and ruined their commerce. The public revenue sank from $24,000,000 to $8,000,000. The Bays of the Chesapeake and Delaware were scoured by Admiral Cockburn and a light squadron: great damage was inflicted on naval stores and arsenals, and the towns on the coast kept in a continual state of harassment.[5]

5 The foreign trade of the United States, anterior to the estrangement from Great Britain so flourishing as to amount to £22,000,000 sterling of exports and £28,000,000 sterling of imports, carried on in 1,300,000 tons of shipping, was, literally speaking, and by no figure of speech, annihilated; for the official returns show that the former had sunk in 1814 to £1,400,000, or little more than an eighteenth part of their former amount, the latter to less than three millions. The capture of no less than 1,400 United States vessels of war and merchandise appeared in the London *Gazette* during the two years and a half of the struggle, besides there was probably an equal number captured which were too inconsiderable to enter that register; and although, no doubt, the Americans retaliated actively and effectively by their ships of war and privateers on British commerce, yet the number of these was too small to produce any considerable set-off to such immense losses.

The United States frigates being confined to their harbors, and the mercantile marine of the country practically destroyed, the Washington Government had abundance of excellent material at their disposal to equip and man their fleets on the inland waters. The lake naval establishments at Sackett's Harbor on Lake Ontario, and Presqu'isle on Lake Erie, were supplied with comparative facility from New York, and Philadelphia, and a naval force, created with great rapidity, very superior to any which Great Britain, engaged in every sea and so distant from her colonies, could produce. The British Ministry, it may be believed, did their best, but at great disadvantage. Thronged and beset by difficulties, it is unnatural that they should still have temporized, still have indulged in a lingering hope that more pacific counsels might yet prevail, or that the chapter of accidents would open at a leaf propitious to the fortunes of Britain. (Col. W. F. Coffin's Chronicles of the War of 1812.)

Sir George Prevost, the Governor and Commander-in-Chief reached Kingston February 23rd, 1813, and animated by his presence the exertions made to restore the equality of the British with that of the United States naval armament on Lake Ontario. One ship of war had been laid down at York, now Toronto, in the preceding year; and another, the "Wolfe," of twenty-four guns, was in an advanced stage at Kingston, but men and stores were both wanting. The United States shipwrights at Sackett's Harbor, through the energy of their government, forereached, hand in hand, those in the British ship yards.

The naval armament of Great Britain on the ocean at this time had attained tremendous proportions, including no less than a thousand ships of war. The strain upon the country was such that it was impossible to provide sufficient trained officers and seamen for the British ships, and they were generally dangerously undermanned. Under the circumstances it appeared hopeless to look for much assistance from the Mother Country for the Provincial Marine. But something was done. In March, 1813, a small naval detachment was forwarded overland from Halifax to Quebec and thence despatched to Kingston. The detachment included Captains Barclay, Pring and Finnis of the Royal Navy, with five lieutenants and a few seamen. Upon arrival in Kingston they took the little Canadian fleet there in hand, and laid themselves out, sturdily, to the work of fitting and equipment. In May they were joined by Commodore Sir James L. Yeo, who had been despatched from England to assume command of the fleet on Lake Ontario. He was accompanied by four captains, eight lieutenants, twenty-four midshipmen and some 450 British sailors.

Up to this period the attempt to hold the naval command of the upper lakes had devolved wholly upon the Canadian Provincial Marine, which it must be remembered, was really a species of permanently embodied naval militia, equipped and maintained by the army authorities rather for the military transport service than for purposes of naval warfare. Its work had perhaps not been very brilliant, but brilliant daring was scarcely called for in an unprepared militia force suddenly confronted by a small but well-disciplined and well-equipped regular one, and with the military operations ashore absolutely depending upon its preservation. During the critical months of warfare in 1812, the Canadian Marine Militia on the lakes afforded pretty fair security for the army's water transport, and that was a great deal to accomplish. It probably saved Upper Canada.

With the arrival of the naval reinforcements from the seaboard, the Canadian Provincial Marine assumed a secondary role, in fact, practically went out of existence. Officers of the Royal Navy assumed command of ships and shipyards and naval petty-officers and seamen were assigned to most of the non-commissioned ratings, and distributed through all of the ships. The balance of the crews were made up from the Provincial Marine, the officers of that force who cared to remain being generally assigned to such ratings as sailing master, master's mate pilot, etc. Several, however, who had distinguished themselves, or had had previous naval experience were kept on duty as lieutenants. Several of the old officers of the Provincial Marine disappeared from view altogether or joined the militia ashore. The services of the Provincial Marine officers and men aboard the fleet proved very useful. for the navigation of the lakes is very different from that of the sea. Being nearer to the seaboard the naval force on Lake Champlain was from the first under regular naval control.

The naval officers as soon as they arrived at Kingston set themselves at work to evolve a fighting fleet out of the material they found at their hands.

Meantime the United States fleet held undisputed command of Lake Ontario but did not take full advantage of it.

The whole coast of Lake Ontario was open and exposed to attack. A descent on Kingston had been planned and was executed. The United States armed fleet consisted of six fine schooners and a ship, mounting together seventy-two guns, all admirably appointed and manned by choice seamen, disposable for an invasion at any point.

The situation of the British troops, both on the Niagara and Detroit, was one of much anxiety, as had the enemy possessed sufficient enterprise to embark a strong land force on board their squadron, and to debark it on the Canadian shore in the rear of Sir Roger Sheaffe's division, the latter might not only have been taken in reverse, but placed between two fires, and the retreat of Colonel Proctor's little army have been equally endangered or cut off.

Then at York there was the much-needed unfinished warship on

the stocks liable to be destroyed at any time by a couple of boat's crews. This ship had been laid down in the preceding year, when the Canadian squadron had the command on the lake, and expected to keep it.

Now that the enemy had been permitted to gain the ascendancy, the ship could not be taken to pieces, nor, in the winter, be disembedded from the ice. All that could be done under the circumstances was to push on the work as a happy-go-lucky experiment—to complete and save her, if it might so chance; and, if not, to destroy her.

Commodore Chauncey, and General Dearborn, the United States General-in-Chief, after due deliberation, preferred a cheap predatory certainty at York to a glorious uncertainty at Kingston; and on April 25th, at a period of the season when the lower St. Lawrence was barred by rugged piles of rotting ice—when roads and rivers were impassable —the United States squadron left Sackett's Harbor, sixteen sail of vessels, conveying a land force of 2,500 men.

How York was captured and the unfinished warship and the public buildings destroyed (April 27th) is a subject of general history. And it is equally unnecessary to pursue further the account of the naval war on the lakes, (for the British lake marine was now in charge of the Royal Navy), except to mention a few facts.

The strength of the British squadrons on the lakes has been misunderstood owing to changes of names, made by wholesale occasionally, and particularly during the winter of 1813-14. Thus the ship "Wolfe," built at Kingston in 1813, became the "Montreal;" the "Royal George," the "Niagara;" the "Melville," the "Star;" the "Moira," the "Charwell;" the "Beresford," the "Netley;" the "Sydney Smith," the "Magnet."

Officers and men of the Canadian Provincial Marine who continued to serve on the lake fleets rendered good account of themselves in all of the actions which followed. For instance at the disastrous but glorious battle of Put-in-Bay or Lake Erie, where the British fleet, completely overmatched by Perry's squadron, was annihilated, Lieutenant Rolette,[6] and Lieutenant Irvine, two of the dashing heroes of the old Provincial Marine greatly distinguished themselves. And out of 470 men on the British ships, between 80 and 100 were Canadian sailors. No less than 240 were soldiers from the 41st and Newfoundland Fencible Regiments.

In view of the part taken by the Canadian sailors in this action, and the boasting over the national victory indulged in by nearly all United States historians, it is interesting to know the opinion of a truly great and representative citizen of the United States, and a skilful and discriminating authority on naval matters at that, on this subject. Theodore Roosevelt (now President of the United States) in his delightfully impartial book "The Naval War of 1812" says (page 274):

"In short our victory was due to our heavy metal. As regards the honor of the affair, in spite of the amount of boasting it has given rise to, I should say it was a battle to be looked upon as in an equally high degree creditable to both sides. Indeed, if it were not for the fact that the victory was so complete, it might be said that the length of the contest and the trifling disparity in loss reflected rather the most credit on the British."

The defeat of Captain Barclay's poorly and lightly-armed little squadron demonstrated how important to the military operations was the command of the lake. Major-General Proctor's army was deprived by the disastrous defeat, of every prospect of obtaining its necessary supplies through Lake Erie, and a speedy retreat towards the head of Lake Ontario became inevitable, thus precipitating the worst

6 Frederic Rolette, who has been called the French Nelson of the Lake Provincial Marine, was born at Quebec in 1783, son of Joseph Rolette an old officer of the Militia of the Quebec district who fought against Wolfe in 1759 and against the Continentals under Arnold and Montgomery in 1775-76.

Was educated at the Quebec Seminary, and when a mere lad, entered the Royal Navy. He saw much active service and received no less than five wounds at the battles of Aboukir and Trafalgar. He returned to Canada in 1807 and shortly afterwards was appointed to the Provincial Marine. By commission of October 4th, 1808, he was nominated 2nd Lieutenant in His Majesty's Provincial Marine.

April 25th, 1812, Rolette received promotion to the rank of 1st Lieutenant in H. M. Provincial Marine, and was given command of the brig "General Hunter," commissioned to cruise on Lake Erie.

During the early days of Hull's invasion of Upper Canada in 1812, the "General Hunter" was in Amherstburg harbor when Rolette espied a United States vessel approach, and put out towards her in a boat with eight armed men. Boarding the stranger he was surprised but not alarmed apparently, to find himself on the deck of a government vessel, the "Cayuga Packet" with four officers and forty men of the United States army on board besides her own crew. His pluck and presence of mind did not desert him. Placing one of his sailors as a sentry over the arm-chest, and others at the companion ways he issued orders in a loud voice to shoot down the first man who showed any disposition to resist. For a time his boldness had the desired effect, but, before long, some of the United States officers, chagrined at their position, began to make menacing demonstrations. At this time the prize was approaching a point on which stood an old stone wind-mill surrounded by a stone fence having the appearance of military works. Rolette in a menacing voice ordered the "Cayuga" to be run in under the guns of the battery. This quelled all idea of an uprising on the part of the Americans, and reinforcements conveniently arriving, the prize, which proved to be of great value was secured. Rolette served ashore with distinction under Brock at the capture of Detroit and in the operations with Proctor on the River Raisin, being seriously wounded while commanding a naval gun detachment at Frenchtown. During the war he served successively on the schooner "Chippewa," the sloop "Little Belt" and the nineteen gun ship "Detroit." In the action on Lake Erie at Put-in-Bay, September 10th, 1813, he assumed command, though wounded, of the "Lady Prevost" after her captain was killed, and was again very dangerously wounded when the magazines blew up. He was taken prisoner of war and held in captivity for several months. Upon his return to Canada he was presented with a sword of honor by his classmates of the Quebec Seminary.

series of disasters sustained by the armies which fought for the independence of Canada during the war.

And so all through the campaign.

The naval campaign on Lake Ontario was largely one of ship-building: a contest between the ship-yard at Kingston and that at Sackett's Harbor. As soon as one fleet secured the preponderence of power it put to sea, and the other sought the protection of its harbor, remaining there until the shipwrights on its side had given it the advantage, when it put to sea and the other brought to under the protection of its land batteries, and remained there until a new ship restored to it the balance of power. Such excessive caution is not customary with the naval leaders of either Great Britain or the United States, but the fleets on the lakes were after all only auxiliaries to the armies, and their preservation was vitally important.

It is highly significant that the disasters on the Canadian side of the lake occurred while the United States squadrons could safely leave their harbors, while the national victories ashore were scored at the times the British squadrons held the command of the lakes. They held the command for a longer period than the United States fleets, British land victories were more considerable in number and effect than the United States ones, and Canada was saved.

During the last summer of the campaign (1814) the losses of men and ships on the lakes were heaviest on the British side; but as Sir James Yeo held command of Lake Ontario for more than four months as against a period of barely two and a half months during which Commodore Chauncey's squadron held the ascendancy, the balance of success for the season is acknowledged to have been in favour of the British.

During the war of 1812-14, the shores of Nova Scotia, New Brunswick and Prince Edward Island were kept free from violation by the Royal Navy. Halifax was the chief naval base of the navy in America, and many maritime province seamen were recruited into the Royal Navy at that and other seaports in the Maritime Provinces. Many Lower Province seamen participated in the war of retaliation waged upon United States ocean commerce. Letters of marque and commissions to privateers were issued by the Governor of Nova Scotia, Sir John Coape Sherbrooke, and numerous captures were made under these at sea, many prizes being taken into Halifax, where trade was temporarily increased by the war.

The war was terminated by the Treaty of Ghent signed Christmas Eve, 1814, and an immediate reduction of the naval and military establishments in Canada followed. The dock yards and naval forces on the lakes remained in charge of the Royal Navy, the old Canadian Provincial Marine practically ceasing to exist.

The following notice appeared in the London *Gazette* of August 21st, 1815:

"In order to secure to us the possession of Canada in case of a rupture with the United States, the Government has given orders to build upon the lakes new vessels and gun-boats suitable for the navigation of those waters. Everything necessary for the arming and equipment of those vessels is preparing in England."

After the restoration of peace several dangerous sources of disagreement between the two countries were found to exist in the restless and even hostile spirit of the Indians on the frontier, in the impressment of seamen for the Royal Navy, in commercial intercourse, in the positive and successful refusal by Great Britain to allow the incorporation in the Treaty of Ghent of any sort of a provision for the continuance of the enjoyment of common rights of fishery on the Nova Scotian and Newfoundland coasts, as she maintained that the United States, by their precipitation of an improvoked and unsuccessful war of conquest had forfeited the special privilege in this respect, up to that time accorded, and in the maintenance of the armanents on the Great Lakes. All of these matters were the occasion of frequent instructions by Mr. Munroe, then United States Secretary of State, to Mr. John Quiney Adams, U.S. Minister at London, looking to their adjustment by conventional arrangements.

The first reference to the matter appears to have been made during the summer of 1815, when Mr. Adams, under the date of August 29th, transmitted to the U. S. Department of State, some British newspapers in which it was announced that His Majesty's cabinet had determined not only to maintain but to augment its armed naval force on the Great Lakes. Mr. Munroe thereupon proposed a mutual restriction of the naval force to be maintained on the lakes by both parties, in an instruction addressed to Mr. Adams, dated November 16th, 1815, containing the following :

"It is evident, if each party augments its force there, (the lakes), with a view to obtain the ascendancy over the other, that vast expense will be incurred and the danger of collision augmented in like degree. The President is sincerely desirous to prevent an evil which it is presumed is equally to be deprecated by both governments. He therefore authorized you to propose to the British Government such an arrangement respecting the naval force to be kept on the lakes by both governments as will demonstrate their pacific policy and secure their peace. He is willing to confine it, on each side, to a certain moderate number of armed vessels, and the smaller the number the more agreeable to him; or to abstain altogether from an armed force beyond that used for revenue. You will bring this subject under the consideration of the British Government immediately after the receipt of this letter."

In a conference with Lord Castlereagh on January 25th, 1816 Mr. Adams submitted the proposal and briefly mentioned having done so in a despatch written to Mr. Munroe, January 31st, 1816, in which he said :

"I can only now state in a summary manner that I think the proposal for mutually disarming on the lakes of Canada, which I made conformably to your instructions, will not be accepted."

On February 8th, however, Mr. Adams wrote to Mr. Munroe more fully, reporting his presentation of the proposal and the views of Lord Castlereagh thereon. Mr. Adams wrote that Lord Castlereagh "replied that we had so much the advantage over them by our position that a mutual stipulation against arming during the peace, would be unequal and disadvantageous in its operation to Great Britain. For as the hands of both parties would, by such an engagement, be tied until war should have commenced, the Americans, by their proximity, would be able to prepare armaments for attack much sooner than those of the British could be prepared for defence. I urged that as at all events the state of the armaments during peace, on one side, must be the measure of those on the other, this advantage of proximity must be nearly the same whether they are great or small."

Mr. Adams again wrote to Mr. Munroe, April 15th, 1816, in the course of this letter stating :

"At the request of Lord Castlereagh I called upon him last Tuesday, when he informed me that the British Government were prepared to make an arrangement of the questions relating to the fisheries, and to meet that of the Government of the United States relative to naval armaments, on the North American lakes, so far as to avoid everything like a contention between the two parties which should have the strongest force there. He asked me if I considered my power adequate and if I had instructions that would authorize me now to conclude an agreement upon these points. I told him that I did not consider my power as extending to the first, and should not feel warranted in concluding an article upon the second without further instructions."

The British Plenipotentiary at Washington, the Hon. Charles Bagot wrote to Mr. Munroe, July 26th, 1816 :

"Mr. Adams having intimated to His Majesty's Government that it was the wish of the Government of the United States that some understanding should be had, or agreement entered into, between the two countries, in regard to their naval armaments upon the lakes, which, while it tended to diminish the expenses of each country, might diminish also the chances of collision and prevent any feelings of jealousy, I have the honor to acquaint you that I have received Lord Castlereagh's instructions to assure you that His Royal Highness the Prince Regent will cheerfully adopt, in the spirit of Mr. Adam's suggestion, any reasonable system which may contribute to the attainment of objects so desirable to both states."

Some enquiries from Mr. Munroe to Mr. Adams regarding his instructions followed, and Mr. Bagot replied the next day, August 13th, 1816, practically closing the provisional arrangements to suspend the further increase of the forces on the lakes, by saying :

"I am not in possession of a correct statement of His Majesty's naval force now in command upon the lakes, but I will take the earliest means of procuring and communicating to you the most accurate information upon this point, and I can in the meantime give you the assurance that all further augmentation of it will be immediately suspended."

On April 5th, 1817, a list is given in the *Upper Canada Gazette* of the following ships being commissioned upon the lakes of Canada: "Kingston," 56, Commodore, Sir Robert Hall; "Burlington," 42, Captain N. Lockyer; "Charwell," 50, Captain Montresor; for Lake Ontario. "Champlain," 32, Captain Duell, for Lake Champlain. "Confiance," 32, Captain D. Pring for Lake Erie.

Mr. Munroe's proposition of August 2nd, 1816, for a specific and equal limitation of the respective naval forces on the lakes did not take definite shape until the spring of the ensuing year, when a formal agreement was entered into by means of the diplomatic device known as an exchange of notes, on April 28th and 29th, 1817. One of the notes so exchanged read as follows

"The undersigned, His Britannic Majesty's envoy extraordinary and minister plenipotentiary has the honor to acquaint Mr. Bush, United States Secretary of State, that, having laid before His Majesty's Government the correspondence which passed last year between the Secretary of the Department of State and the undersigned upon the subject of a proposal to reduce the naval force of the respective countries upon the American lakes, he has received the commands of His Royal Highness the Prince Regent to acquaint the Government of the United States that His Royal Highness is willing to accede to the proposition made to the undersigned by the Secretary of the Department in his note of August 2nd last.

"His Royal Highness, acting in the name and on the behalf of His Majesty, agrees that the naval force to be maintained upon the American lakes by His Majesty and the Government of the United States shall henceforth be confined to the following vessels on each side, that is—

"On Lake Ontario, to one vessel not exceeding 100 tons burden and armed with one 18-pounder cannon.

"On the Upper Lakes, to two vessels not exceeding like burden, each armed with like force.

"On the waters of Lake Champlain, to one vessel not exceeding like burden and armed with like force.

"And His Royal Highness agrees that all other armed vessels on these lakes shall be forthwith dismantled, and that no other vessels of war shall be there built or armed. His Royal Highness further agrees that if either party should hereafter be desirous of annuling this stipulation, and should give notice to that effect to the other party, it shall cease to be binding after the expiration of six months from the date of such notice.

"The undersigned has it in command from His Royal Highness, the Prince Regent, to acquaint the American Government that His Royal Highness has issued orders to His Majesty's officers on the lakes directing that the naval force so to be limited shall be restricted to such services as will in no respect interfere with the proper duties of the armed vessels of the other party.

"The undersigned has the honor to renew to Mr. Bush the assurance of his highest consideration.

"CHARLES BAGOT."

The United States note was practically a duplicate.

On May 2nd the United States Secretary of the Navy instructed the several United States naval commanders on Lake Erie and the upper lakes, Lake Ontario and Lake Champlain, to confine the force in actual or occasional service within the limits defined in the arrangement. Under these orders, the schooner "Lady of the Lake," 89 tons, was assigned to Lake Ontario; the smaller schooners "Porcupine" and "Ghent" to the upper lakes, and the galley "Allen" to Lake Champlain.

It was not until a year later that any uncertainty appears to have arisen at Washington as to the character of the arrangement, suggesting that it might so far partake of the nature of a foreign treaty as to call for the advice and consent of the United States Senate.

Following the usual routine in such cases, the arrangement was submitted to and ratified by the Senate and proclaimed by the President on April 28th, 1818, the specific stipulations of the agreement being extracted from the correspondence exchanged with Mr. Bush and Mr. Bagot the year before, and embodied in the text of the proclamation. (U. S. Senate Executive Documents, 1892-3.) Thenceforth a small naval establishment was maintained on the Great Lakes by the Royal Navy, a captain with the local rank of commodore having the command. All of the formalities of the sea service of the navy appear to have been complied with. The *Loyalist* of June 7th, 1828, mentioned that Commodore Barrie in "His Majesty's schooner 'Cockburn' entered this port (York) on Monday last, and landing at the garrison was received by a salute which was returned from the schooner. The yacht 'Bullfrog' was in company with the 'Cockburn.'"

Apart from the few guard boats maintained on the lakes in accordance with the so-called Treaty of 1817 the rest of the old naval establishment was allowed to fall into decay.

Referring to the condition of the dock-yard at Kingston in 1832, Lieut. T. Cooke of H.M. 45th Foot, in his book entitled "A Subaltern's Furlough," writes:

"Several large hulks of vessels of war built during the last war, to cope with those of the Americans on the stocks at Sackett's Harbor, and which were never launched, are fast falling to decay in the navy-yard at Kingston. A seventy-four had been sold a few months previously for £25 and a few days before our arrival, a heavy squall of rain accompanied by lightning had split the "St. Lawrence" of 120 guns down the centre. The props giving away, the vessel broke into a thousand pieces, covering the ground all round with a heap of ruins."

Mr. Cooke added that he expected that the four or five frames of vessels still there on the stocks would soon meet with a similar fate, which they did.

A list of articles offered at a couple of sales at the Kingston dock yard a few years later convey some idea of the extent of that establishment.

May 20th, 1834, a large quantity of naval stores, boats, etc., was advertised to be sold at the Kingston dock yards, including the "Bullfrog," yard boat of about 60 tons, nearly new and completely rigged and well furnished in every respect. There was also according to the catalogue an immense stock of anchors, cables, chain, rope, blocks, canvas, compasses, lead, nails, tools, needles, two complete sets of frigates' sails, hammocks, flags, timber, etc.

The sale does not appear to have been satisfactory, at least as far as the "Bullfrog" was concerned, for another great public sale of naval stores was advertised to take place at the Kingston dock yard June 27th, 1836, and her name figured therein. Besides stores of every imaginable kind used in ship-building, the sale included one frigate in frame, fifty-six guns; one ship in frame, twenty-two guns; one brig in frame, fourteen guns, and one schooner in frame of four guns; also the "Cockburn" schooner, seventy tons, paid off in 1834, with her mast and spars; also the "Bullfrog" tender of sixty tons, with her sails and rigging in store; "also ten gun-boats in good condition as far as they are finished," to quote the exact words of the advertisement, besides, "one old schooner and four old ships of war lying aground in the harbour," to again quote the same source. But besides this decidedly miscellaneous collection there were twelve boats, new and in use, from fourteen to thirty-two feet, chiefly built of the best rock elm, and in addition were offered six fire engines, three in good repair, the others repairable. The papers of the day give no information as to how this sale resulted. (Robertson's Landmarks of Toronto.)

About this date the whole patrol service maintained by the Royal Navy on the lakes appears to have been withdrawn, and there was nothing like an armed force maintained there under the British flag until the Navy Island incident during the Mackenzie Rebellion.

Soon after the rebel camp under Mackenzie and Van Rensselar had been formed on Navy Island in 1837, a strong force of militia was mobilized and encamped on the Canadian shore opposite, under Col. Allan McNab. Preparations were set on foot for the fitting out of a flotilla of armed vessels and gun-boats to be used for the purpose of clearing the island of the intruders; but the process was a slow and tedious one, necessarily involving much delay. Meantime, Captain Drew, a retired officer of the Royal Navy, who had been appointed head of an extemporized "Naval Department," had begun to enroll a small naval brigade or company of naval militia. His first recruits were some sailors, including several old men-of-war's men, and some boats being secured, a serviceable little force was at hand to do reconnoitering, etc. On December 28th the "Caroline" began her trips as a rebel transport between Fort Schlosser on the New York side of the Niagara River and Navy Island. She was cut out and destroyed on the night of the 30th. Captain Drew commanded the flotilla of five boats which did the deed, and the crews were composed of the men of the Naval Brigade, reinforced by some volunteers from the militia.

Captain Drew's exploit was rapturously applauded throughout Upper Canada, and in the following April, when the St. George's Society of Toronto dined together as usual on the evening of the 23rd, the toast of the "Royal Navy" was received with great enthusiasm. It was responded to by Captain Marryatt, the famous novelist, who, after he had returned thanks for the honor done to him in coupling his name with the toast proposed, gave, as an additional volunteer toast "Captain Drew and his brave comrades who cut out the "Caroline."

In the following November took place what is always known as the Battle of the Windmill. A number of desperadoes on board the steamer "United States" and the two schooners "Charlotte," of Toronto, and "Charlotte," of Oswego, attempted to invade Canada at Prescott. The project failed utterly, and also resulted in serious loss of life among the invaders. The notorious "Bill Johnson" was again to the fore, he having command of one of the two schooners. In this engagement the following lake steamers, which had been armed in consequence of the rebellion, played an active part. They were the "Experiment," "Queen Victoria" and "Cobourg," under Captains Dick, Sutherland, and Colclough. The "Transit," also under Captain Richardson, did good service during the rebellion in transporting troops and carrying despatches.

The main object of the rebels was to embroil the two neighboring countries, and it is not surprising that during the year 1838 the attention of the Washington authorities was particularly drawn to the subject of the lake armaments established by the Upper Canada Government. Upon enquiry it was found by the United States authorities that prior to 1838 no British armed vessel had been maintained above Detroit during many years, and that at the time of the Navy Island affair the British authorities hired two or three lake schooners in that vicinity and armed and manned them for the purpose of frustrating the threatened invasion. These vessels did not emerge from the Niagara River into Lake Erie as cruisers while so armed and manned, but were discharged as soon as that particular danger had passed away.

"Later, in the summer and autumn of 1838, the authorities in Upper Canada employed one or more armed steamers, hired for the purpose and manned with a certain number of troops, to cruise on Lake Erie against apprehended incursions from the United States shores by the 'Patriots.' And after the burning of the British merchant steamer "Sir Robert Peel," on the St. Lawrence, in 1838, and up to the close of navigation in that year, the Canadian authorities employed several hired steamers, besides barges, all armed and manned, cruising against parties of the 'Canadian Patriots,' principally on the St. Lawrence River, but, as would seem, at times emerging upon the Canadian waters of Lake Ontario." (United States Senate Report 1892-3.)

In view of these defensive armaments being in excess of those permitted by the arrangement of 1817, Mr. Forsyth, then Secretary of State, in the latter part of 1838, invited the British minister, Mr. Fox, to a personal interview, and called his attention to the disregard by Her Majesty's colonial authorities of the conventional arrangement between the two countries as to the extent of their respective naval armaments upon the lakes. Subsequently Mr. Fox addressed to the Secretary of State the following note :

"Sir,—I am informed by Her Majesty's authorities in Upper and Lower Canada that, in consequence of the unlawful and piratical acts of hostility to which these provinces are at present exposed, it has been found necessary to equip under the British flag a more extensive naval armament upon the lakes and rivers which include the boundary line between the British and American possessions than either Government would be authorized to maintain according to the stipulations of the convention of 1817."

This note does not appear to have been answered or even acknowledged by Mr. Forsyth. With the close of navigation in the St. Lawrence and the cessation during the winter of active operations by the "Canadian Patriots," the immediate necessity of formal action upon the British request, either by acquiescing in the proposed augmentation of the Canadian naval force on the lakes, or by denying it as

incompatible with the existing stipulations, had passed. In fact, according to a report of Gen. Scott, the season of 1839 was "a tranquil one," and he did not hear of a single armed British vessel on Lake Erie.

As the rebels and their sympathizers were still threatening descents on the Canadian shores, in 1839 a Canadian government cruiser was built at Niagara and one on Lake Ontario, two steamers being also bought from citizens of Buffalo for service on Lake Erie.

March 9th, 1840, attention was drawn to the matter in the House of Representatives. In 1841 Congress passed the historical "Fortifications Bill," and embodied in it was a resolution, moved as an amendment, authorizing the President to have constructed or armed such vessels on the lakes as he might think proper and as should "be authorized by the existing stipulations between this and the British government."

Shortly after this Mr. Daniel Webster formally brought the matter of the increase of the British armament on the lakes to the attention of Mr. Fox, Her Majesty's minister, by a note dated September 25th, 1841, in which, after reciting the terms of the agreement to him by Mr. Fox on November 25th, 1838, he said :

"We are now informed that two large steam vessels fitted for warlike service, of 400 or 500 tons burden, and capable of carrying fifteen or twenty guns, are built, partially equipped, and ready to receive ordnance, and now lie at Chippewa. The Government of the United States does not allow itself to doubt that the object of this preparation is purely defensive, and intended only to guard against attacks like that of 1838; but as far as exceeds the amount of force which either Government is permitted to maintain, by the stipulations of 1817, it seems proper to call the attention of the British Government to the subject, to the end that both parties may have a clear understanding upon it. It is hoped, therefore, that if not already instructed respecting the object of the armament, you will inquire at the proper source, to the end that you may be able to give explicit assurances to this Government that these vessels of war, if, unhappily, it shall be found necessary to use them at all, will be confined to the sole and precise purpose of guarding Her Majesty's provinces against hostile attacks."

Two months passing without a reply, Mr. Webster again addressed Mr. Fox, a letter containing the following sentences :

"The United States have not been disposed to make complaint of the temporary deviation from this agreement by the British Government in 1838, under what was supposed to be a case of clear and urgent necessity for present self-defence. But it cannot be expected that either party should acquiesce in the preparation by the other of naval means beyond the limit fixed in the stipulation, and which are of a nature fitting them for offensive as well as defensive use, upon the ground of a vague and indefinite apprehension of future danger."

Mr. Fox replied on the following day, November 30th, 1841, giving the desired assurances that the vessels of war in service on the lakes had been equipped "for the sole purpose of guarding Her Majesty's provinces against hostile attack, it being unfortunately notorious that Her Majesty's provinces are now, as then, threatened with hostile incursion by combinations of armed men, unlawfully organized and prepared for war, within the frontier of the United States; and it being found by experience that the efforts of the United States Government, though directed in good faith to suppress those unlawful combinations, are not attended with the wished-for success."

In accordance with the provisions of the "Fortifications Act" of 1841, the United States side-wheel war steamer "Michigan" was launched on Lake Erie in 1844. Her registered tonnage was 498, and her armament then consisted of two 8-inch guns and four 32-pounder carronades.

This drew forth from the British Government a remonstrance through Mr. Packenham, Mer Majesty's Minister at Washington.

The British Government had built and launched two cruisers on the lakes about the same time as the "Michigan" was being built, having since the trouble on the lakes after the rebellion, from fillibusterers, realized the importance of maintaining the nucleus of a naval force on the lakes, but the British officials had been scrupulously careful to keep the armament within the provisions of the agreement of 1867. As it had been found impossible to build steam cruisers within the tonnage requirement of the conventional agreement of 1817 it was decided to build vessels of a serviceable size and capable of being transformed into useful cruisers, but in time of peace to arm them with only one gun, thus observing the spirit of the agreement of 1817. In accordance with this decision, during the latter end of 1843 was commenced at Kingston the cruiser "Cherokee" launched the following year, having been built under the superintendence of Mr. Tucker, Naval Contractor, sent out from England to Kingston for the purpose. She was of 700 tons, and her full armament was to be eighteen guns, six and nine-pounders. She was commanded by Captain Davis, R.N., Lieut. Riccalton, R.N., being chief officer. She was only equipped with one gun, and cruised between Kingston, Toronto, Hamilton and Niagara, lake mariners, and generally Captain Thomas Dick of the steamer "Chief Justice Robinson," being engaged as pilots. After cruising about Lake Ontario for a few years she was taken to Halifax and sold, running for several years as a mail boat between Halifax and St. John's, Newfoundland.

A small gun-boat, the "Mohawk" was built at the navy yard, Kingston, about the same time as the "Cherokee" and did duty for

some ten years as a cruiser on Lakes Erie and Huron, under command, first of Lieut. Tysson, R.N., and later of Lieut. Herbert, R.N. She was broken up early in the fifties.

September 5th, Mr. Colhoun, U.S. Secretary of State wrote to Mr. Packenham that he had referred his letter to Mr. Mason, U.S. Secretary of Navy. He enclosed that gentleman's letter, which admitted that the "Michigan" had her full armament on board but had not yet put to sea. In consequence of the remonstrance the "Michigan" was ordered to remain in port until further orders. Mr. Mason's letter went on to say :

"It is worthy of remark, that at the date of the agreement between the two Governments, steamers were in use to a very limited extent as passenger vessels, and perhaps not at all as ships of war. The restriction as to tonnage would probably not have been adopted if their use had been anticipated. No effective steamer for any purposes, it is believed, could be built of a tonnage of 100 tons.

"I would respectfully suggest that this consideration would justify a revision of the agreement on the subject, and also that if it is considered that the British vessels are not inconsistent with the agreement by reason of the armament being limited to one gun each, the armament of the steamer 'Michigan' can be readily reduced to that number."

Accompanying reports mentioned by Secretary Mason are indefinite. Lieut. Parmelee learns that there is "a powerful British steamer, with her armament taken out," at Penetanguashia, on Lake Huron, While Passed Midshipman Lambert reports the recent launch at Kingston of a wooden steamer, the "Cherokee," of some 600 tons, capable of being fitted for service in twelve days, and able to mount from sixteen to twenty-four guns; the presence, in commission at Toronto of the iron steamer "Mohawk," rated at from four to six guns; the schooner "Montreal," on Lake Ontario, and on the upper lakes the iron steamer "Minus" and the schooner "Experiment," both commanded by officers of the Royal Navy.

The breaking out of the Confederate Rebellion in 1861 resulted in strenuous efforts being put forth to strengthen the defences of the United States on the water, as on land.

On August 31st, 1861, Lord Lyons addressed Mr. Seward, stating that the attention of Her Majesty's Government had been drawn to the size and armament of the naval force maintained by the United States on the lakes above Niagara Falls; that the tonnage of that force, "and certainly the armament of the steamer 'Michigan' would seem to be in excess of the limit stipulated in the arrangement of 1817;" and that he was instructed to represent the matter to the Government of the United States.

Mr. Seward, after consulting with the Secretary of the Navy, replied, September 12th, that the naval force of the United States on the upper lakes consisted of the steamer "Michigan," of 582 tons, carrying one gun of eight-inch calibre, and that the vessel was then, as theretofore, used exclusively for the purpose of recruiting seamen.

The matter then appears to have dropped, but as the ill-feeling between Britain and the United States resulting from the Trent Affair, the "Alabama" incident, the St. Albans Raid, etc., developed, it came up again at Washington in connection with the question of protecting the northern frontier against raids by Confederate sympathizers from Canada.

In the House of Representatives on June 13th, 1864, Mr. Spalding introduced a joint resolution with a view to terminating the arrangement of 1817. It was referred to the Committee of Naval Affairs, and on June 18th, was reported back, without amendment. Pending the question on its engrossment, Mr. Elihu B. Washburne submitted an amendment, which was agreed to. The resolution was thereupon read a third time and passed. The preamble recited, as justifying notice of termination, that

"The treaty of eighteen hundred and seventeen, as to the naval force upon the lakes, was designed as a temporary arrangement only, and although equal and just at the time it was made, has become greatly unequal through the construction by Great Britain of sundry ship canals; and whereas the vast interests of commerce upon the Northwestern lakes, and the security of cities and towns situated on their American borders, manifestly require the establishment of one or more navy-yards wherein ships may be fitted and prepared for naval warfare; and whereas the United States Government unlike that of Great Britain, is destitute of ship canals for the transmission of gun-boats from the Atlantic Ocean to the western lakes, etc."

In this form the resolution went to the Senate, where it failed of consideration during that session.

October 24th, 1864, Mr. Seward wrote to Mr. Adams representing the United States at London :

"It is, however, impossible to resist the conviction that peace cannot be reliably maintained upon the border unless more effective measures shall be adopted to secure that end than those that have hitherto been used by both Governments.

"It is now my duty to instruct you to give notice to Earl Russell, in conformity with the treaty reservation of that right, that at the expiration of six months after you shall have made this communication, the United States will deem themselves at liberty to increase the naval armament upon the lakes if, in their judgment, the condition of affairs in that quarter shall then require it. * * * You will assure the Earl, however, that this proceeding is adopted only as a necessary measure

of national defence, and not only with no purpose of hostility, but, on the other hand, with a desire no less earnest than heretofore to preserve the most friendly relations with Great Britain."

November 26th, Lord Russell wrote to Lord Lyons, British Ambassador at Washington :

"It is perfectly competent to the United States to give notice that at the end of six months that Government will be at liberty to increase their naval force on the lakes. It is certainly true that while both nations are disarmed on the lakes marauders or depredators may destroy or capture unarmed vessels belonging to either party. Her Majesty will, of course, be at liberty also to increase her naval force on the lakes at the expiration of the six months after notice, if she should think fit to do so."

January 18th, the pending joint resolution of Mr. Spalding with an amendment by Mr. Sumner, was considered in the Senate in Committee of the whole, and, the amendment having been agreed to, the resolution was reported to the Senate as amended and forthwith passed. (Senate Journal Thirty-eighth Congress, second session, p. 82.) The House of Representatives concurred in the amendment February 4th, 1865, and the resolution was approved by the President on the ninth of the same month as follows :

"Be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled, that the notice given by the President of the United States to the Government of Great Britain and Ireland to terminate the treaty of eighteen hundred and seventeen, regulating the naval force upon the lakes, is hereby adopted and ratified as if the same had been authorized by Congress."

But just about this time the situation on the Canadian border had materially changed for the better, and the Southern rebellion had about collapsed.

Under these reassuring circumstances, and notwithstanding the action of Congress in attaching legislative sanction to the executive notification of termination, which would in terms end the arrangement on May 23rd, 1865, steps were taken to continue it "practically" in force after that date, and on March 8th, 1865, Mr. Seward sent to Mr. Adams, in London, an instruction, including the following :

"As it is hoped and believed that, under existing circumstances, no further incursions of that character may be apprehended, you may say to Lord Russell that we are quite willing that the convention should remain practically in force; that this Government has not constructed or commenced building any additional war vessels on the lakes or added to the armament of the single one which was previously its property; and that no vessels will in future be built or armed for us in that quarter. It is hoped and expected, however, that Her Majesty's Government, on its part, so long as this determination shall be observed in good faith by that of the United States, will neither construct nor arm nor introduce armed vessels in excess of the force stipulated for by the convention referred to."

No record appears of the action of Mr. Adams upon this instruction, but that he did in fact communicate its purport to Earl Russell is seen by an enquiry addressed to Acting Secretary Hunter June 15th, 1865, by Sir F. Bruce, who had succeeded Lord Lyons as British minister.

To this enquiry Mr. Seward replied on the following day, June 16th, 1865, that the instructions to the United States Minister at London, of March 8th, upon which his reported communication to Earl Russell was based, "was intended as a withdrawal of the previous notice within the time allowed, and that it is to be so held by this Government."

The Hon. John W. Foster, United States Secretary of State in a report on this question to President Benjamin Harrison, (Senate Executive Documents, 2nd sess. 52 Cong., 1892-93, and special session March 4th, 1893, Vol. 1 Nos. 1 to 19 inclusive) made some interesting observations. He remarked for instance :

"The question of the spirit which controls and should control, the understanding of two great Governments in this regard is to-day of vastly greater importance to their interests than any narrow contentions respecting its literal observance. Three-quarters of a century have passed since the arrangement to limit the effective force on each side to four vessels not exceeding 100 tons burden apiece, and each armed with one eighteen-pounder cannon, was passed. It is obsolete. Steam has supplanted sail power for naval purposes. The character and calibre for necessary and useful ordnance has undergone a change no less great.

"An equally notable geographical change has taken place. Ship canals have made possible the passage of comparatively large vessels from lake to lake, and even from the extremest shores of Superior or Huron to the Atlantic Ocean. In 1817 a ship of any tonnage was confined to the lake on whose shores it was built. The waters of Erie, Ontario, and even Champlain, had been the scene of historical naval combat, but the engaging fleets of three-deckers, carrying seventy-four guns apiece, had been built in those lakes, while the signing of the treaty of peace left other half-built frigates to decay on the stocks.

"Under the changed conditions now prevailing such cumbrous armaments are as impracticable as needless. Flotillas of light-draft, gun-boats, rapid and easily manœuvred, are now most suitable for use on the lakes in time of war; in peace they should well be restrained on either side."

Since 1892 there has been no change in the situation as regards this important agreement.

After the absorption and neglect of the old Provincial Marine,

the idea of a Canadian naval militia organization was not altogether dropped.

During a certain period the British Government appears to have had an idea of establishing an auxiliary fleet of merchant vessels capable of being converted upon emergency into cruisers. With this object in view, some steamers built according to certain requirements were subsidized, with the understanding that they were to be at the disposal of the government in case of trouble. Among the subsidized vessels, according to the statement of her owner and commander, Captain Sutherland, a mariner in his day well-known on Lake Ontario, was the steamer "Magnet," launched at Niagara in 1847. The "Magnet" was modelled by a Clyde firm and the plates and other parts shipped to Canada and put together at Niagara by James and Neil Currie, the latter of whom resided in Toronto in 1893. The British Government appears to have made a cash contribution towards her construction. The option thus secured appears to have been taken advantage of during the Fenian Raid of 1866 when the "Magnet" was used as a cruiser. In the Canadian Militia Act adopted after the Union of the Canadas in 1841 provision was made for a naval or marine force in connection with the Militia Department but no serious effort ever appears to have been made by the militia authorities to encourage the naval militia.

In February, 1863, a report of the state of the Militia of Canada was prepared by Lieutenant-Colonels de Salaberry and Powell, Adjutants-General of the Militia respectively in Lower and Upper Canada, which showed that there were 25,000 volunteers organized. The units of the force were enumerated as field batteries, troops of horse, companies of artillery, engineers, rifles, infantry and naval and marine companies, but it is to be observed that only one naval company was returned as having performed twelve days' drill.

There was a considerable stirring up of the military spirit of the country at the time of the "Trent Affair" and later, as a result of the rumors of Fenian preparations for an invasion. Naval Brigades were organized at Toronto, under Captain McMaster and at Dunnville on Lake Erie, under Captain Lachlan McCallum (later well known as Senator McCallum), at Port Stanley under Captain Ellison; at Kingston under Lieutenant Chrysler; at Garden Island under Captain Roney; at Oakville under Captain Chisholm and at Hamilton under Captain Harbottle. The strength of all of these corps was given in the official returns as fifty-five, except the Toronto "Brigade" which was given as having sixty-five men.

At the time of the premature alarm over a Fenian raid in 1866 the Toronto, Hamilton, Garden Island and Port Stanley Naval Companies were called out with the rest of the militia force placed on acting service March 8th, being relieved from duty on the 26th of the same month.

The schooner "Eureka" was placed at the disposal of the Toronto Volunteer Naval Brigade and was taken out by them under Captain McMaster for the first time, April 14th, 1865. The Toronto *Globe*, speaking of the brigade said they were well-drilled, and doubtless, at the call of duty, would be ready.

When the Fenian invasion actually took place during the early part of the summer of 1866, some of the Naval Brigades were at once called out for active duty, the necessity for establishing a lake patrol service and transport being very apparent, and the call was loyally responded to. After the dismissal of the force which had been on active service, the following letter was received by Captain McMaster:

Ass.-Adjutant General's Office.

Toronto, June 10th, 1866.

Sir,—I am directed by Major-General Napier, C.B., commanding H. M. forces and volunteers in Canada West to express to you his thanks for the efficient services rendered by the naval brigade under your command, particularly recently, when required to take charge of and convert the steamer "Rescue" into a gun-boat; in discharging her cargo and getting the necessary armament on board in a very short time and in a highly creditable manner, and when relieved from the charge of the "Rescue" in performing similar good service when placed in charge of the steamer "Magnet." And the Major-General will not fail to avail himself of the services of the Naval Brigade afloat should an opportunity occur, and will have great pleasure in bringing before the notice of His Excellency the Governor-General the important and valuable services which they have rendered.

I have the honor, etc.,

Wm. S. Durie,

Captain McMaster, Lt.-Col. A. A. G. M.

Commanding Naval Brigade, Toronto.

In spite of this appreciative letter the Naval Brigade was not generously treated, and as a result of the dissatisfaction thus produced, according to the Toronto *Leader* of July 20th, 1866, "This body of well-drilled young men is now disbanded."

August 8th, the same year, Captain McMaster and Lieutenant McGregor of "the late Volunteer Naval Brigade" were the guests of honor at a complimentary dinner in Toronto at which they were both made the recipients of a flattering address and valuable presents.

The Dunnville Naval Company had a more stirring part to play in the Raids, being in the thick of the trouble on the Niagara Peninsula. The company, upon the crossing of O'Neil's force into Canada, was detailed to the tug "W. T. Robb," a vessel belonging to Captain McCallum,

and constructed by him a few years previously for the purpose of towing lumber rafts on Lake Erie.

At four a.m. on June 2nd, 1866, the day of the Battle of Ridgeway, Colonel Booker despatched the "Robb" from Port Colborne down the shore of Lake Erie on a reconnaissance, the tug having on board besides part of the Dunnville Naval Brigade, the men of the Welland Field Battery armed with rifles, Lieut.-Col. Dennis, militia staff, and Captain Akers, R.E. While the fighting was going on at Ridgeway the "Robb" arrived at Fort Erie, the original base of the Fenians. Two parties were landed and made sixty prisoners, who were placed on the tug. The landing parties, which had united, and consisted of fifty-two artillerymen and eighteen members of the Naval Brigade, were surprised and surrounded by the Fenians outside the village after the return of the raiders from Ridgeway. The "Robb" had left the wharf just about the time the Fenians arrived. The Canadians, although outnumbered twenty to one, fought well, killing seven Fenians and wounding many others before surrendering. On the Canadian side five batterymen were wounded. Captain McCallum with two of his men of the Naval Brigade and thirteen artillerymen escaped along the bank of the Niagara River, being pursued over two miles. They finally succeeded in getting on board the "Robb" again, the rest of the force being taken prisoners, except Colonel Dennis and Captain Akers.

Shortly after this the Dunnville Naval Brigade passed out of existence.

The last of these Ontario Naval Companies carried on the Militia list were those at Port Stanley and Hamilton, the last named appearing in the returns for 1869. In his annual report for 1867 Lieutenant-Colonel Taylor, D.A.G , at London, wrote :

"There is a company of Marines at Port Stanley whose term of service has now expired. Were this corps made Marine Artillery the men say they would re-engage and this would become a most useful force at this station."

Apparently the hint was not taken, and in the next Militia list the name of the Port Stanley Naval Company did not appear. The Hamilton Naval Company continued to figure in the list until 1870, when it too disappears from view.

Detachments from the Royal Navy again saw service on the Great Lakes at the time of the Fenian Raids. June 5th, 1866, a detachment of 120 officers and sailors from H.M.S. "Aurora" arrived at Toronto per G.T.R. from Quebec. A portion of them took possession at Toronto of the "Magnet," which was then being fitted out as an armed cruiser by the Toronto Volunteer Naval Brigade. The rest proceeded to Windsor, which was understood to be threatened by a party of raiders from Chicago, and the following day, those first detailed to the "Magnet" followed.

There were at this time several small but powerful English-built gun-boats on the Great Lakes, but chiefly on the River St. Lawrence, they having been sent there at the time complications were feared over the lapse of the Reciprocity Treaty, the fisheries question, etc. These were all fully equipped after the raids and manned from the Royal Navy. By August the government had ready for river and lake service the gun-boats "Britomart," "Rescue," "St. Andrew," "Royal" and "Cherub."

Some of these vessels were carried regularly on the list of the Royal Navy, and were known as the English gun-boats; others were chartered and maintained altogether by the Canadian government although manned by men from the Royal Navy. According to the Kingston *Whig* of April 3rd, 1867, the following were the officers in charge of the English gun-boats: "Heron," Lieutenant Solly; "Britomart," Lieutenant Allington; "Cherub," Lieutenant Huntley.

The Provincial gun-boats were manned from H.M.S. "Aurora" as follows: "Prince Alfred," Lieutenant Douglas, three officers, one surgeon, two engineers and sixty-four men; "Rescue," Lieutenant Fairlie, two officers, two engineers, and forty-eight men; "Hercules," Lieutenant Hooper two officers, one surgeon, two engineers and fifty men.

Upon the accomplishment of Confederation in 1867 the English gun-boats were withdrawn from the lakes and taken to the Atlantic, where we afterwards hear of them in connection with the fisheries protection service. All the officers and men of the Royal Navy who had manned the "Provincial Gun-boats" were also withdrawn from the lakes, the gun-boats themselves being transferred to the Militia Department Two of them, the "Prince Alfred" and "Rescue" were kept in service until the Fenian excitement was well over. At the time of the Fenian Raids of 1870 both of these gun-boats were on the upper lakes, doing useful transport and convoy service in connection with the Red River Expedition. (7) Later in the year they were recalled to their patrol duty on Lake Erie and the Upper St. Lawrence. The Adjutant-General of Militia in his annual report for 1870 stated that at the close of the season the "Prince Alfred" was stationed at Sarnia and the

(7) As indicative of the wide range of usefulness of a naval force it might be remarked that a few officers and men of an organized naval force would have proved very useful in the suppression of the Northwest Rebellion in 1885, although the scene of operations was laid in the prairie country. Being in the hands of civilian crews, the usefulness of the stern-wheel steamers used in the transport service on the Saskatchewan could not be fully developed; while it is only necessary to read the reports of General Middleton and Major (now Lieut.-Col.) Henry Smith of C. Company, I.S.C., to realize what an important factor the improvised gun-boat "Northcotte" might have been made at Batoche, had her officers and crew been trained and disciplined, and actuated by the esprit-de-corps which is such a valuable product of any wholesome military or naval organization.

"Rescue" at Kingston. The "Prince Alfred" was originally a powerful tug steamer on the Upper Lakes and had been altered in such a manner as to render her an effective gun-boat, being fitted with bullet-proof iron shields to go round the bulwarks. Her final armament consisted of two nine-pounder and two twelve-pounder Armstrong guns, and one thirty-two and one twelve-pounder howitzer. The "Rescue" carried two guns, but was not so well constructed or adapted to act as a gun-boat.

The naval Militia "Brigades" or "Companies" on the lakes having been allowed by the neglect of the Militia authorities to drop out of existence, these two original gun-boats in the service of the then young Dominion were not only manned, but commanded, by civilians, artillerymen being drafted to them to man the guns.

When the Fenians in western cities of the United States were threatening trouble in the autumn of 1869, the Adjutant-General, on October 18th, received instructions to man, arm and despatch the "Prince Alfred," then lying at Goderich, on Lake Huron, for the defence of the Sarnia and Detroit frontier. A civilian master and crew to navigate the vessel were engaged. As an armament, two nine-pounder field guns of the Toronto Field Battery were telegraphed for, an officer and twenty men to act as gunners being drawn from the same corps. Two officers and thirty men were also drawn from the Goderich Garrison Artillery Company, then attached to the 33rd Huron Battalion, Lieut.-Col. N. M. Ross. The anomaly of a garrison artillery company being attached to an infantry battalion, is partially excused in the reports by a statement that Lieut.-Col. Ross had passed through the School of Gunnery and held a first-class certificate. This capable officer was appointed to the command of the "Prince Alfred." On proceeding to coal the vessel she was found to leak badly, having been allowed to get out of repair, but owing to the energy of the crew, she was duly caulked, coaled and victualled, and was reported ready for sea on the 21st, sailing the next morning and remaining on her cruising station until November 23rd. The Toronto Field Battery nine-pounders with which the "Prince Alfred" was first equipped, were subsequently replaced by four naval guns obtained on loan from the Imperial Government, when the detachment of the Toronto Field Battery returned home, being replaced by additional men from the Goderich Artillery Company.

Reference has already been made to the absence on the Upper Lakes of the gunboats, "Prince Alfred" and "Rescue" at the time of the Fenian Raids of 1870. The militia authorities were loth to be entirely without a water patrol service on the Upper St. Lawrence and Lake Ontario. Consequently a second "Prince Alfred," a tug, was chartered at Brockville, and a few militiamen put aboard. The steamers "Prescott" and "British America" were also under charter by the Militia authorities for a short time for patrol service, and to keep up communication between the different bodies of militia in the field.

The "Prince Alfred" and "Rescue" were under the direct charge, for the Militia Department, of Mr. G. H. Wyatt, described as "Gun-boat Agent" who in a report to the Adjutant-General at the end of the year 1870, recommended that the crews be enlisted for three years, instead of being engaged by the month for eight months each year. He claimed that a saving would be effected by this, as there was a great waste, particularly in the constant change of firemen and engineers. He remarked in a report :

"When we have to change so frequently as in the past season, men are not on board long enough to care about saving fuel, and I saw repeated waste in consequence, but as the men came and left as they liked, we had but little control over them. It would be different were the crew under articles. The extra expense of keeping them on during the winter months would be $400 for provisions; they could be learning their drill and working in various ways during that time. * * *"

The Adjutant-General, commenting on this report, recommended that the gun-boat crews be regularly enrolled to serve in the militia for three years, and be also trained in the use of guns, and the officers be commissioned as officers in the force. The report was never acted upon.

During 1871 the "Prince Alfred" and "Rescue" were once more in commission, and the former was used as a training ship for lake-shore garrison artillery batteries, which corps there seems to have been some idea of training as marine artillery. At any rate, during the season, the St. Catharines, Collingwood and Sarnia batteries embarked in succession on the "Prince Alfred" and for eight days "were practised at gun drill and firing shot and shell, the vessel during the period cruising on Lakes Erie and Huron." (Militia Annual Report.)

In connection with the original plan for the reorganization of the old militia of the various confederated provinces, and the formation therefrom of one effective national force, which plan was adopted immediately after the establishment of the Dominion, it was proposed to create a practical naval militia force in the maritime provinces to be recruited from the large and hardy sea-faring population there. Steps were taken to organize a Naval Brigade of three companies with headquarters at Halifax in 1867. In his annual report dated December 31st, 1867, Colonel R. Bligh Sinclair, "Adjutant-General of Nova Scotia Militia" stated under the heading "Naval Brigade:"

"The formation of this force has not been completed, the reason being principally the want of means to employ competent instructors, with an inspector from the Royal Navy or Marine Artillery at outposts. Should these means be afforded, and the numerical strength of

the force warrant it, I would recommend the subdivision of the men into different brigades under separate commands."

During the winter the organization of the corps was completed, and the "First Division of the Naval Brigade" of the Dominion Militia existed as an efficient unit for several years, eventually, and very naturally, considering that it was under military control, losing its character as a naval organization, and in the latter part of 1870, and the beginning of 1871, became incorporated with the Halifax Garrison Artillery as the "Second Brigade." The official report by a captain of the Royal Navy of the first inspection of this Naval Brigade is interesting as indicating the work done and attempted.

"Royal Alfred."

HALIFAX, August 7th, 1868.

SIR,—In accordance with your memorandum of the 4th instant, I proceeded to Dartmouth, accompanied by Lieutenant Sheepshanks, and inspected the First Division of the Naval Brigade.

2. There were present 122 officers and men. On arriving on the ground I inspected the Division, and found the men, generally speaking, very fairly dressed in the uniform of the Naval Brigade, and twenty-four men were put through the new Cutlass Drill, which they did fairly, but they were picked men, and the only men of the Division who had any knowledge of this exercise.

The Dartmouth and Halifax Divisions were then exercised at great guns separately.

3. Both of these Divisions have a rough knowledge of the Great Gun exercise, but there is room for much improvement, especially in sponging and loading, and laying the guns on an object.

4. There were only a few men capable of taking the place of No. 1, especially in the Halifax Division, so the officers were obliged to take that number.

5. At the conclusion of the inspection, I addressed a few words to the Division, pointing out where they were deficient, and the necessity of constant practice and exercise.

6. There seems to be a very good spirit amongst officers and men, and I consider their efforts praiseworthy and worthy of encouragement.

7. I beg to enclose Major D. H. Pitt's statement respecting the First Division.

I have, etc.,

(Signed) W. C. CARPENTER,
(Captain).

From Major Pitt's report it appears that the total strength was eleven commissioned officers and 205 men, ninety-four men being unavoidably absent from inspection. There were twelve men qualified for captains of guns, seventy-two having a fair knowledge of first instruction; sixty-three having a fair knowledge of second instruction, and fifty-eight having a fair knowledge of third instruction.

Among the new levies raised in the lower part of the Province of Quebec under the Militia Act of 1868 were two corps described in the militia report of 1870 as "Marine Companies," one at Bonaventure and the other at New Carlisle. They appear, however, to have been merely trained as infantry, and soon lost even the name of "Marines".

In the Militia Act, which, with a few amendments, obtained from 1886 to 1904 (49 Vic., Chap. 41) there continued to be the old provision for the organization of naval corps under the Department of Militia and Defence. Section 12 of the Act read as follows :

(12). The Militia shall be divided into Active and Reserve Militia —Land Force, and Active and Reserve Militia—Marine Force:

The Active Militia—Land Force—shall be composed of (a) Corps raised by voluntary enlistment; (b) Corps raised by ballot; (c) Corps composed of men raised by voluntary enlistment and men balloted to serve :

The Active Militia—Marine Force—to be raised similarly, shall be composed of seamen, sailors and persons whose usual occupation is upon any steam or sailing craft, navigating the waters of Canada :

The Reserve Militia—Land and Marine—shall consist of the whole of the men who are not serving in the Active Militia for the time being.

This fact must be apparent to any one perusing this chapter—that while the responsible military leaders of Canada have found an auxiliary naval force to be absolutely indispensable to the successful defence of Canada upon every single occasion when the national safety has been imperilled by armed enemies, the military authorities cannot, and quite naturally, be depended upon to foster and maintain such a naval force.

The Hon. J. Raymond Prefontaine received the portfolio of Minister of Marine and Fisheries, November 11th, 1902. Shortly after assuming office Mr. Prefontaine stated that it was the intention of the department to establish the nucleus of a Canadian navy and to have training ships on the Great Lakes and also on the Atlantic and Pacific.

In the House of Commons June 22nd, 1903, Mr. Prefontaine explained in reply to an enquiry, that the government had adopted the principle of a naval militia for Canada, but up to that time nothing had been done beyond setting enquiries afoot. It was felt that the first thing to be done was to prepare for the establishment of marine schools, and that had been done. As regards the naval militia it would entail quite a large sum of money, perhaps $500,000 to begin with. Of course,

before submitting any plans involving so large an expenditure it would be necessary to procure a great deal of information, and that would take some time.

In the estimates of the department discussed in the House of Commons in Committee October 8th, 1903 was an item of $7,500 "For expense of Enquiry into the subject of a Naval Militia, and School of Navigation." Before the item was passed, the Minister explained that there was originally asked for, $5,000 for the School of Navigation, and the amount had been increased by $2,500 in order to enable a study to be made of the question of establishing a naval reserve or militia.

During the session of 1904 the Minister of Marine and Fisheries gave notice of the introduction of a bill providing for the establishment of a Naval Militia, but owing to the prolongation of the session, the bill was not introduced. There had been placed, moreover, in the estimates of the Department, discussed in Committee of the House of Commons, August 9th, 1904, an item of $50,000 "To provide for the organization of a Naval Militia for Canada." The Minister explained that the department had 680 men engaged on the cruisers and in the fishery protection service, and the idea was to first form the nucleus of a naval militia by engaging these men for three years and paying them the whole year round instead of hiring the crews during the summer months alone. This money would be necessary to make preparations.

As the Naval Militia Bill had not been introduced the item was allowed to stand.

During this same session the new Militia Act (4 Edward VII. Chap. 23), was discussed at great length and passed, and in connection therewith a practical step was taken towards the establishment of the Naval Militia proposed by the Minister of the Department of Marine and Fisheries. All the old provisions for the organization of naval and marine corps under the Department of Militia and Defence were eliminated, but in Section 12 it was specially provided that among the persons to be exempt from liability to service in the militia were: "members of the Naval Militia."

In this way Parliament may be said to have already sanctioned the principle of Mr. Prefontaine's proposal.

Reference has been made in another chapter to the naval appearance and character of the new cruisers "Canada" and "Vigilant." Still another step towards the accomplishment of the Minister of Marine's plan to establish a Naval Militia under his department was taken during the winter of 1904-5, when the "Canada," with details from the crews of all the Dominion fishery cruisers, was despatched on a prolonged instructional cruise to the West Indies, when officers and men underwent a course of training in naval discipline and training.

This year (winter 1905-6) a similar cruise has been planned for the "Canada."

Under arrangements with the Militia Department several of the members of the crews of the Dominion Government steamers have also taken special courses in gunnery in the Royal School of Gunnery in connection with the R.C.A. at Quebec.

At the moment of going to press (December, 1905) the Hon. Mr. Prefontaine is in England, where, among other business in connection with his Department, and particularly with respect to this matter of a Canadian Naval Militia or Reserve, he is negotiating with the admiralty with a view of taking over the Imperial dock yards at Halifax and Esquimalt, which thus seem destined to become the bases of the Canadian navy.

In all matters pertaining to the organization of the new Canadian Naval Militia force, the Minister of Marine and Fisheries, has had the advantage of the professional knowledge, skill and keen personal interest of Commander O. G. V. Spain, R.N., Commanding the Marine Service of Canada and the Fisheries Protection Service, who, as stated elsewhere (Chapter VIII.), has, since his appointment, kept the question of a Canadian Naval Reserve, with the crews of the Dominion Government Cruisers as a nucleus, persistently to the front.

CHAPTER X.

Canadian Fisheries.

THEIR EXTENT, AND WHAT THE DEPARTMENT IS DOING TO PROTECT AND DEVELOP THEM.

THE total value of fish caught, and fish products prepared, in Canada, the year 1903 aggregated $23,101,878. This result was achieved without any abnormal yields in any of the provinces.

The French were probably first in the field as fishermen in Canadian waters. Basque, Breton and Norman fishermen must have there plied their calling during the earliest years of the sixteenth century; for one John Dennis, of Honfleur, in 1506 traced a chart of the Gulf of St. Lawrence for the guidance of his compatriots. The English, when they first visited that sea region, as fishermen, which was not till the year 1517, reported that they found fifty French, Spanish, and

Portuguese vessels prosecuting the cod-fishery. In 1536, the French cod-fishery had greatly extended; and, in 1558, there were thirty vessels besides, employed in pursuing the whale. At that date, there were but ten English vessels frequenting the banks of Newfoundland; while there were 100 from Spain and fifty from Portugal. But in 1615, the relative proportions had greatly altered, for at this time they stood thus: English vessels 250, French and Portuguese (together) 400. The English Government doubtless fostered their Newfoundland fisheries as a nursery for seamen, (and as yielding an article of ready barter; for supplies of salted fish were not so essential to a Protestant as to a Catholic population).

The attention of French adventurers in America was divided, at this time, between the fisheries and the peltry traffic. These pursuits were at first commingled; for the early French fisheries of the coasts of Canada and Acadia used to trade with the native seaboard tribes, deriving a double profit therefrom. By degrees, regular relations are formed between the parties; and for the convenience of both, factories were founded on or near the coasts, and these gradually extended to the interior. By and by, opulent merchants obtained from the French Government trading monopolies, on condition of sending and establishing colonists. Thus it was, that New France came to be founded. The first grant of the fisheries of Canada was made by the King of France to de Monts in 1603.

But the cod and whale fisheries were still to be free to all; and a reservation was made in favor of the colonists individually; that they might deal with the natives for peltry, provided it were sold to the company's agents at a fixed price.

The exports of fish from Canada itself were inconsiderable in early times. In 1607, the Sieur de Reverin formed a factory, and established a fishery at the harbor of Mont Louis, about half way between Quebec and the extremity of the Gulf of St. Lawrence, on the southern side. At the commencement, the people of the settlement were much disturbed by the English; but their exertions, in both fishing and agriculture, were tolerably successful. The cod and whale fisheries in American waters were almost entirely in European hands; but to the Canadians were left seal and porpoise catching. This industry was plied in the River and the Gulf of St. Lawrence, also on the coast of Labrador; tracts of shore in both regions being left on farm for terms of years by the Government.

There were fourteen fishing-stations below Quebec, existing in 1722. In latter years, a tolerable quantity of animal oil and salt fish was exported to France.

Since the discovery of Nova Scotia fishing has been prosecuted on its coasts. The fisheries of Newfoundland had been open to all nations from the settlement of the island until the time of Sir Humphrey Gilbert, who claimed sovereignty under the right of original discovery—the fisheries of Nova Scotia continuing long to be the subject of altercation between the British and French governments.

At the date of Confederation of the Provinces, the official business relating to the fisheries, had been for several years organized and managed as a branch of the Department of Crown Lands, for the united provinces of Upper and Lower Canada. In the sister provinces of Nova Scotia and New Brunswick no similar organization existed. There were however in these latter provinces certain statutory and municipal regulations existing; but owing to the want of effective machinery to enforce them, and a proper system under which the restrictions thus provided could be applied, they produced scarcely any practical benefits, consequently the fisheries were subject to serious abuses in many respects which had already reduced them almost to exhaustion. The very extensive fishing interests of the maritime population of those provinces, and the great commercial importance of their coast and river fisheries, rendered it highly desirable that some uniform and efficient system should be devised under which the general "Sea Coast and Inland Fisheries" of the Dominion, as placed under control of the Federal Government at Confederation, might be regulated, protected and developed. The first Minister of Marine and Fisheries found that after a few years' application of various legislative enactments, carried out through the fishery officer, the Canadian Government had effected material improvements in the condition of the provincial fisheries, and that some further encouraging results still attended the operations of the Department. Such being the case, Mr. Mitchell deemed it advisable to make enquiries into the state of the laws, and the wants of the fisheries in the maritime provinces. With this view, he caused careful enquiries to be made throughout Nova Scotia and New Brunswick, to ascertain the existing state of things, and to determine what was requisite to be done. It was found that in many respects the laws actually in force in those provinces, could, by supplying certain defects, and providing suitable officers to enforce them, be made serviceable. It also appeared desirable to maintain the official system of management already established, and by extending it to the fisheries of the other provinces profit by the past experience. The act organizing the Marine and Fisheries Department therefore made provision for this purpose.

A measure was also carried in the first Dominion Parliament consolidating and amending the fishery laws. This was the statute known as the Fisheries Act, applicable to Canada. Under this act the fishery laws and regulations previously existing in Nova Scotia were left intact. Power was, however, taken to alter and amend them from time to time by special regulations; and machinery was provided to enforce

them. The New Brunswick Acts have become incorporated with the amended laws, leaving such fishery regulations to be carried out as proved applicable, and could be rendered serviceable pending the substitution of new and improved by-laws.

Another important law was also passed, respecting the regulation of the inshore fisheries. This law was like in substance and effect (but with ampler powers and simpler process) to the statutes of Nova Scotia and New Brunswick affecting the same subject. All of these laws had become necessary as auxiliaries to the Imperial Act 59 Geo. 3, Cap. 38, the enforcement of which by provincial authorities they to some extent supersede—that statute having contemplated action and application chiefly and more directly through imperial instructions and authority.

The whole expenditure for the fisheries service in the financial year from July 1st, 1867 to June 30th, 1868, amounted to $32,887.49. There was collected during the same period as fishery revenues, a sum of $19,536.51.

The fisheries branch of the Department of Marine and Fisheries has developed tremendously since the Confederation year.

During the fiscal year 1903-04 the total expenditure for the different services connected with the fisheries of Canada amounted to $634,824. There were collected as fishery revenues $95,756.

In order to ensure the development of the fisheries industry the Department enforces efficient measures of protection including laws and regulations enforced (*a*) by a large staff of officers distributed along the coasts frequented by fishermen; (*b*) by armed cruisers on the Atlantic coast, in the Hudson Bay and northward, and on the Great Lakes.

The departmental measures of assistance to the industry include (1) bounties to fishermen; (2) the establishment of close seasons intended to protect the fish at the most critical period of their existence—the spawning season; (3) the maintenance of a system of leases and licenses through which the Department is enabled to regulate fishing in accordance with local requirements; (4) fish-breeding establishments; (5) Fishing Intelligence Bureau, inaugurated in 1889, by means of which the movements of bait and of fish can be daily ascertained and reported by telegraph communication, at the principal stations; (6) assistance in the replenishing of the lobster and oyster fisheries by artificial means; (7) the instruction of fishermen in the best methods of curing and packing herring; (8) the provision under Federal auspices, of facilities for the storage and preservation of bait in refrigerators; (9) concerted action to abate the dogfish nuisance, etc.

As well put in the last annual report of Lieut.-Colonel F. Gourdeau, the Deputy Minister of Marine and Fisheries, "The fisheries of Canada are the most extensive in the world, extending over our immense sea-coast line, besides innumerable lakes and rivers. The eastern sea-coast of the maritime provinces from the Bay of Fundy to the Strait of Belle Isle covers a distance of 5,600 miles, while the western sea-coast of British Columbia is reckoned at 7,180 miles, which is more than double that of Great Britain and Ireland. While the salt water inshore area, not including minor indentations, covers more than 1,500 square miles, the fresh water of that part of the Great Lakes belonging to Canada is computed at 72,000 square miles, not including the numerous lakes in Manitoba and the North-West Territories, all stocked with excellent species of food fish."

No less than 79,134 men were engaged during the year 1903-04 in the Canadian fisheries, not including the thousands of persons employed in the lobster branch of this industry. These fishermen used over six millions and a half of fathoms of gill nets and seines besides other fishing gear and fixtures, representing an aggregate capital of $12,241,454. This shows nearly one million dollars in excess of the capital invested in the same industry during the previous season. Alone the lobster plant is valued at $1,378,197, comprising all the equipment of the 714 canneries dispersed on the sea coast of the maritime provinces.

Nova Scotia had 242 such canning establishments, New Brunswick 199, Prince Edward Island 190, and Quebec only 83. Over 14,000 persons found employment in this lobster packing industry, which placed on the market over 10,500,000 one-pound cans, besides a larger quantity of this crustacean disposed of alive or in a fresh state, both aggregating the handsome value of $3,625,000. The salmon canning industry of British Columbia, during the year 1903, consisting of 75 canneries valued with all equipments at $1,312,500, gave employment to over 17,000 persons and placed on the market nearly 23,000,000 cans of salmon, exclusive of the 10,000,000 pounds otherwise disposed of, fresh, salted or smoked. The whole catch of this valuable fish aggregated nearly $3,000,000. The sealing fleet from the same province during the season of 1903 consisted of only twenty-six vessels, using ninety-two boats and 164 canoes, manned by 299 white men and 338 Indians. This fleet with its full equipment is valued at nearly $500,000. The value of the fur seal hunt for that year (20,496 skins) is given at over $360,000.

The fisheries of Canada's inland waters are very valuable, although in some lakes and streams there has been a great depletion of fish owing to the use of nets, and the pollution of the water by manufactories, sewage, etc.

On the Great Lakes seines were used for the capture of whitefish in Lake Ontario as early as 1807. Gill nets first came into use in 1847. Lake Erie, though one of the smallest of the Great Lakes, has in some years yielded a greater catch of fish than all the others combined. Lake

Ontario is the only one of the Great Lakes in which there has been an alarming decrease in trout. Lake Erie has fifteen varieties of market fishes. There has been a great falling off in the abundance of the whitefish in Lake Erie. The herring is by far the most abundant of the market species inhabiting Erie. Pound nets were used for the first time in Lake Erie in 1850. Seine nets were first used in 1815. In Lake Huron trout is the most important species taken in the fisheries. In the early history of the lake, whitefish was the most important species. The first fishing tug employed in Lake Huron was in 1860. There are about 145,000,000 pounds of fish taken out of the Great Lakes annually.

The total value of fish caught and fish products prepared in Canada during the year 1903 aggregates $23,101,878. With one exception, in 1901, when the phenomenal catch of salmon in British Columbia swelled the total value beyond $25,000,000, this is the largest aggregate on record. It exceeds the amount of the previous year by over $1,000,000.

From the year 1869 to 1903 inclusive, the five principal commercial fishes yielded the following large values: Cod, $128,978,513; salmon, $78,073,972; lobster, $72,270,477; herring, $68,105,595; mackerel, $45,089,021.

During the fiscal year of 1903-04 the fish and fish products as well as marine animals exported from Canada to foreign countries amounted in value to $10,759,029, exportation being chiefly to the United States and Great Britain.

During the period of 1869-95 the total value of the yield of the fisheries of Canada amounts to $339,766,000, an average of $14,800,000 a year. By provinces the value of the catch during the period 1869-95 was distributed as follows :

Ontario, 6.64 per cent.; Quebec, 13 per cent.; Nova Scotia, 43.70 per cent.; New Brunswick, 19.20 per cent.; Prince Edward Island, 6.04 per cent.; Manitoba and N.W.T., 11.38 per cent.

Nova Scotia had in 1885 46.8 per cent., and in 1895 30.7 per cent. British Columbia had in 1885 6 per cent., and in 1895 21.8 per cent.

During the calendar year 1903, the values of fish taken by provinces was as follows: Nova Scotia, $7,841,602; British Columbia, $4,748,365; New Brunswick, $4,086,800; Quebec, $2,211,792; Ontario, $1,535,144; Manitoba and North-West Territories, $1,487,665; Prince Edward Island, $1,099,510.

The deep sea fishermen of the maritime provinces received the sum of $158,943 as bounties on their respective catches of fish for the season of 1903. The owners and crews of 851 fishing schooners received $72,936, or nearly half of the amount; showing that fifty-six more vessels than in 1902 participated in this bounty. On the other hand, 600 boats less than in the previous year shared in this distribution of $86,007, amongst 19,149 boat fishermen. By provinces, Nova Scotia received by far the largest amount of the bounty, viz., about $100,000.

While Quebec drew $34,700, New Brunswick only secured $14,872 and Prince Edward Island received less than $10,000 for its share. Since its inception (1882) the sum of $3,474,910 has been distributed amongst the fishermen of the above mentioned provinces to better enable them to prosecute their calling.

It will be recalled that by the award made in 1877 by the Halifax Commission sitting under the Washington Treaty, the Dominion Government received from the United States Government, through the Imperial Government, the sum of $4,490,882 as Canada's share in the Fishery Award. The interest of the sum was appropriated for the purpose of the bounty.

Many efforts to foster and promote the sea fisheries have been made during recent years by the Department. It is only necessary to refer to two. Season after season, the lack of bait not merely hampered, but absolutely stopped fishing operations at the most important part of the season. For over twenty years the subject engaged the attention of the Department, and in 1899 action was taken to provide freezers where bait fish could be stored and kept in condition. The legislation provided that the fishermen in various localities could incorporate themselves into associations to build and construct bait freezers, the government contributing one half the cost of construction and equipment and paying for three years a bonus of five dollars per ton on the amount of bait freezers. Up to the end of December, 1902, the total number of fishermen's bait freezers was twenty, but at the end of the year 1904 there were no less than twenty-nine of these institutions, while two new ones were actually in process of construction and proposals for three or four more were under consideration.

The Dominion fisheries, extending, as they do, over so vast an area, and including seas, rivers, and lakes, varying in every physical feature, yield the most varied food products, and afford a field for almost every possible fishery enterprise. In addition to their importance from the commercial point of view and as a source of food for farmers, settlers, prospectors and residents in the most remote regions, they have a value not to be over estimated for angling and sport generally. Hence the necessity for conserving the fisheries for all these various important purposes, and the Marine and Fisheries Department is taking energetic steps to protect the fisheries of Canada and to prevent, where possible, any depletion of its waters. The great interests at stake are constantly kept in view by the Department, whilst at the same time all is being done that can be to encourage and foster a desire in fishermen and

others engaged in the industry of fishing to assist in properly maintaining regulations that will preserve our great heritage.

The various provincial governments are also adopting measures, progressively stringent to protect the fisheries, particularly those of inland waters.

CHAPTER XI.

Fish Culture.

Interesting and Valuable Work of the Dominion Fish Hatcheries.—Lobster and Oyster Propagation.

CANADA has, since even before the organization of the Department of Marine and Fisheries, taken a leading part in the practical development of the art of Pisciculture. That Canada can claim this credit is largely due to the devoted and determined efforts of Mr. Samuel Wilmot, the organizer of this particular service of the Department.

The idea of fish culture as a branch of commerce is due to a French peasant, who first introduced the artificial breeding of fish into France. As soon as the Government ascertained its practicability, measures were adopted on a large and extensive scale. It was taken up as a national project. The Government took every possible means to ensure the immediate and substantial success which happily followed the undertaking. A series of buildings were erected, and ponds constructed covering some seventy imperial acres for the breeding and acclimatizing of native and foreign fish. The total cost of this establishment was £10,667 sterling. The expense attending the care of it during the first nine years was £13,887 sterling. The average annual expense being about £2,000. From this nursery, the French Government has been, and still is restocking the most of the rivers and lakes of the country with valuable fish, distributing through the several provinces many millions of young fish of the best kinds annually. The establishment is now considered one of the most practicable and valuable of the public industrial institutions.

It may not be uninteresting as well as instructive to make mention here of the rapid growth which has attended the work of artificial fish culture since its commencement in this country.

Its origin was a private enterprise commenced by Mr. Wilmot; as an amateur, for experiment and amusement, in his private residence at Newcastle, in Ontario.

The premises so occupied were situated on Baldwin's (or Wilmot's) Creek, a small stream traversing the township of Clarke, in the county of Durham, and discharging into Lake Ontario, about forty miles east of Toronto.

The fish-breeding operations at Newcastle in Ontario were commenced originally with the view to the artificial propagation of the migratory salmon of Lake Ontario, but the experiments in the rearing of this fish, together with the several kinds of apparatus that were originated in connection with this enterprise having proved to be of the most useful and practical character and being thoroughly systematized, have been since applied to the general working of all the salmon-breeding establishments in the maritime provinces.

This creek was well situated for salmon, as it forms a natural inlet of the sheltered bend of the lake between Bonds Head and Darlington. Although at its entrance into the lake it passes through a marshy lagoon, the bed of the stream further inland is of a gravelly nature and the water is pretty clear, regular and lively in its flow.

In early times it was famous for salmon, great numbers of which fish frequented it every autumn for the purpose of spawning. They were so plentiful seventy-five years ago, that men killed them with clubs and pitchforks—women seined them with flannel petticoats—and settlers bought and paid for farms and built houses from the money obtained by the sale of salmon. Later they were taken by nets and spears, over 1,000 being often caught in the course of one night. Concurrently with such annual slaughter, manufactures and farming along the banks fouled and changed the creek from its natural state and made it less capable of affording shelter and spawning grounds. Their yearly decreasing number at length succumbed to the destruction practised upon them each season from the time of entering the creek, until nearly the last straggler had been speared, netted or killed. Such is, in short, an epitome of the history of every once populous water connected with Lake Ontario.

In 1865 a scanty remnant was snatched from extinction through the efforts of the originator of our hatcheries. This remnant was afterwards utilized by Mr. Wilmot, who conceived the idea of restocking the stream by artificial reproduction. His initial experiments, purely of an individual character, were prosecuted during two years under much outside difficulty and at very considerable personal labor and expense. They were, however, successful, establishing the important fact that salmon eggs could be hatched out there and the young fish reared through proper means and intelligent care. The first

experiment tried was by collecting a few hundred eggs from the bed of a creek, where a few odd salmon were yet found to enter. These were transferred to the cellar of the house, where a small stream of water was made to pass through a trough in which gravel was placed, to represent as nearly as possible the bed of the natural stream. The experiments, proving satisfactory, were continued the following years and were brought to the notice of the Commissioner of Crown Lands, under whose jurisdiction the fisheries interests of the country were then managed.

By an Order-in-Council issued at Mr. Wilmot's solicitation in 1866, Wilmot's Creek near Newcastle, in the township of Clarke, was set aside for the natural and artificial breeding of salmon.

At Confederation Mr. Wilmot was appointed a fishery officer under the Marine and Fisheries Department, with instructions to apply himself more particularly to the specialty of Pisciculture.

Aided to a very limited extent in the following year by the Government, Mr. Wilmot preserved, and he exhibited in 1869 upwards of 140,000 well shapen, healthy and active salmon fry from three-fourths of an inch to one and a half inches long, already susceptible of being fed and reared to that stage of vigor and growth when naturally they would emigrate from their native stream and return as adolescent salmon. These fry were no hybrids—no doubtful or inferior members of the salmon family—but the thorough progeny of the true salmon (Salmo Salar) which forms so valuable a product of our sea-coast and tidal river fishings in other parts of the Dominion. Their identity was an ascertained certainty. Grilse, or in other words, two-year-old salmon, of the experimental hatching of 1866, having revisited the creeks in the fall of 1868, were actual progenitors of part of the large hatch of salmon fry shown in 1869. The female grilse is not known to propagate on her first migration from sea, but the male does. The few full grown stock fish, male and female, which were during the autumn of 1869 accompanied by the large number of grilse returning to the stream, were rendered available towards supplying the fecundated ova laid in the hatching troughs.

In 1869 additional government aid was granted, and the results of the experiments proved to be of a very satisfactory character. This year the government appointed a special Commission to investigate and report upon the work of artificial fish-culture as carried on at Newcastle in Ontario. Mr. Whitcher, Commissioner of Fisheries, and Mr. Venning, Inspector of Fisheries for New Brunswick and Nova Scotia, were commissioned to visit the establishment, and after a minute inspection and close investigation into all matters connected with the industry, reported favorably, as will be seen by reference to their report published in the Marine and Fisheries report for the year 1869 (page 66, fisheries' appendices). Messrs. Whitcher and Venning, having dealt with the subject intelligently and in a practical manner, concluded their remarks as follows: "We cannot close this brief report without bearing cheerful witness to the untiring zeal, practical intelligence and ingenious industry which has enabled Mr. Wilmot to surmount difficulties and brave discouragements necessarily attending the experiments which he has so persistently pursued to a successful conclusion; and we beg leave respectfully to commend his interesting and useful labors—promising extensive benefit to our fishery interests—to such substantial recognition on the part of the Government as they deserve."

From this period artificial fish-breeding made rapid progress, being vigorously applied in a practical way, under the directions of the Fisheries Department, to other portions of the Dominion. In 1873, two establishments were built, one at the Miramichi River, in New Brunswick, the other on the Restigouche River, for the joint interests of the Provinces of New Brunswick and Quebec. This latter institution was largely supplemented with funds for its construction by the Salmon Angling Lessees of the Restigouche River and its tributaries. In 1874 two more nurseries were erected at Gaspe and Tadousac, in Quebec; and in 1875 a salmon hatchery was established at Bedford, in Nova Scotia; and a whitefish nursery at Sandwich, in Ontario. During 1879 two more fish-breeding nurseries were erected, one on the Dunk River, in Prince Edward Island, the other on the St. John River, New Brunswick; thus making in all nine institutions established for the artificial propagation of fish since the public recognition of this new industry in Canada in 1868.

The establishments at Tadousac, Gaspe, Restigouche, Miramichi, Bedford, Dunk River, P.E.I., and St. John River, N.B., are at present used wholly for the breeding of salmon.

Although Mr. Wilmot's experiments at Newcastle have proved, and are still proving of inestimable value to the fisheries of Canada, the direct object for which the hatcheries on Wilmot's Creek were established, namely, the restocking of the salmon streams flowing into the St. Lawrence and the Great Lakes has not been attained, and the salmon has completely disappeared from the Upper St. Lawrence and the Great Lakes, and their tributaries. Some years elapsed after the establishment of the Newcastle hatcheries before defeat in the matter of the restocking of the Ontario salmon streams was admitted.

In 1872, besides placing salmon fry in various tributaries of the Great Lakes which in former years had produced salmon more or less abundantly, the Department tried the experiment of transplanting salmon from Lake Ontario to the Ottawa River. The place chosen for planting the fry was Salmon River, about forty-five miles below

the city of Ottawa. It had been previously examined by Mr. Wilmot's directions; and, being found favorable, was prepared for the reception of young salmon. About the middle of June, Messrs. Whitcher and Wilmot successfully conveyed to that stream and planted several thousands of salmon fry in a vigorous condition, and they were afterwards observed to be advancing rapidly towards the parr state.

Ten or twelve thousand more fry, from the Government establishment at Newcastle, were added to their number the following spring. Should any of these fish, on arriving at maturity, be found at Salmon River, Mr. Wilmot proposed to improve the experiment by liberally stocking other tributaries of the Ottawa River with salmon.

In the departmental report of 1872 it was stated :

"Adult salmon which are undoubtedly the produce of Mr. Wilmot's operations in fish-culture, are now found in nearly all the streams between the Bay of Quinte and the mouth of the Niagara River. Many of these streams were last autumn literally crowded with breeding fish."

The experiment of restocking with salmon at Salmon River was continued in the spring of 1878. Nearly 30,000 salmon fry, in healthy condition, were liberated at different places in the stream. This deposit made altogether 47,000 little fish distributed in Salmon River. The guardians in charge of the stream reported that the upper waters were crowded with young salmon in the autumn months, and that many were seen exceeding ten inches in length. It was expected to be proved conclusively the following season whether or not these youngsters would emigrate to the salt-water and return after the fashion of their kind to the nursery waters in which they were reared, though not bred. It was thought that the natural instinct which leads salmon back to their native streams might possibly develop itself in a secondary manner among those artificially hatched and transferred to other waters, thus leading them as adults to localities where they had passed the earlier stages of their existence. These hopes were not realized.

Commercial traffic in the salmon of Lake Ontario, even in the most palmy days, never was carried on largely, from the fact that it was held to be almost impossible to catch them during the summer months in the open waters of the lake. A few enterprising fishermen, however, introduced the use of the trap or pound net which was found to be the only engine by which these fish could be taken; for a few years a considerable number were caught in this way. Serious objections were raised by the inhabitants against this mode of fishing, which culminated eventually in prohibiting the use of trap nets by legislative enactment. The great bulk of salmon taken in Ontario in former years (and they certainly were destroyed in vast numbers), was by means of torch-light and spear, late in September and in October, in the various rivers and creeks into which they entered at this period of the year for spawning purposes.

During some years previous to the inauguration of the Newcastle hatcheries in 1868, scarcely any of them could be found in the tributary streams of Lake Ontario; but after that date, and after the introduction of the artificial method of re-producing them at the Newcastle Hatchery, large numbers had been found up to 1879 entering not only the Newcastle Creek, but also many other rivers and streams emptying into Lake Ontario; considerable numbers having also been captured in the lake during the early summer months by the very limited use of a few of the same old trap-nets formerly used.

In 1876-77 several hundreds of these salmon were thus netted during the months of June and July along the shore of the lake, immediately fronting the outlet of the stream upon which the Newcastle Salmon Nursery is established; and it was held by the fishermen engaged in the work that, in comparing the means adopted, and the few nets used in capturing these salmon, the numbers taken in these years were almost, if not, quite equal to the catch of former times, when these fish were considered most plentiful in Lake Ontario.

In his annual report for 1881 Mr. Wilmot, regretfully, it might well be supposed, admitted the impossibility of successfully hatching salmon fry in Ontario streams; and also noted the practical disappearance of salmon from the lakes and their tributaries.

Under the latter head he wrote :

"The falling off of Ontario Salmon fish is beyond all comprehension. The phenomenon is so perplexing that only theories and conjectures can be advanced to account for the wonderful decrease, in fact almost total absence of salmon in this stream last fall.

"But, after all, the falling off in this little stream is not, comparatively speaking, very much greater than in some of the great rivers of the maritime provinces. * * * I may draw attention to my statement in the report of 1879. When speaking of Ontario salmon it is said that, in 1878 the run of fish in the creek was remarkably large, and in 1879 the numbers were unprecedently small, bearing no fair comparison whatever with the runs of fish for several years back. All that time I was anticipating a change for the better in 1880, but what were the facts? A perfect riddle presented itself in relation to the salmon, not only were they not as plentiful as in 1879, but we could find no males. So perplexed and astonished was I at this circumstance that I at once wrote a letter to Professor Baird relating the fact; he was equally surprised and requested me to allow the letter to be published, which was done in the Forest and Stream, in November, 1880, hoping thereby that some scientist, theorist, fishermen or savant would explain this salmon freak."

As to the impossibility of successfully continuing salmon breeding operations in Ontario streams, he wrote :

"Newcastle Hatchery.—The buildings, ponds and grounds at this place are in good repair and condition. With the view to introducing the German carp into the country, the several ponds originally intended for salmon and other fish, were converted into carp ponds.

"As mentioned in former reports, it has been found, from physical changes in the country, certain waters, which were formerly adapted for the rearing of salmon and speckled trout, have now become wholly unsuited for these fish. It has therefore become a necessity to substitute some other description of fishes for many of our rivers and streams in Ontario.

"Long experience, coupled with many experiments, have shown the difficulty of breeding and growing the higher orders of fish like the salmonoid family in water exceeding a temperature of 60°; but when it reaches 75° and upwards, as it is at times in midsummer in most of our creeks in Ontario, the production and growth of these fish becomes an impossibility. With increased temperature comes increased evaporation by the atmosphere and greater absorption by the soil, almost drying up the smaller feeders and reducing the volume of water in the streams to such an extent as to make them almost tepid. A superabundance of organic matter is produced, which keeps the water continually turbid, and consequently tainted in the hot summer months. Therefore it is that only the inferior order of fishes can now subsist in our frontier waters, whereas in former years, when the country was in its normal state, trout and salmon inhabited them almost universally. Hence the proposed substitution of the German carp.

"These fish have been introduced into the American waters within the past few years by Prof. Baird, Commissioner of Fisheries for the United States, whose success in hatching and growing them has been marvellous.

"The Carp Cyprius Carpio of the family Cypridnæ, is a toothless fish, and consequently not a fish of prey; it is well adapted to take the place of the trout, and other fishes in many of the Canadian waters which have become too warm and turbid of late years for the salmon species."

Up to this time, whilst large numbers of the Ontario salmon had been turned out from the Newcastle Hatchery into the waters of the Provinces of Ontario and Quebec, it must be understood, however, that greater attention had been given during later years to the rearing more extensively of those kinds of fishes which were held to be the really commercial product of the Great Lakes of the Province of Ontario, namely: the great lake-trout, and the highly esteemed white-fish. This fact is seen by reference to the annual fishery reports of the Department, where it was shown that the aggregate numbers of impregnated ova of the salmon trout and white-fish for 1877-78 and 1879 in the two Ontario Hatcheries amounted to sixty-three millions and upwards, against only two million of the eggs of the salmon; and in the Newcastle nursery alone the quantities of salmon trout were nearly three times greater than the salmon.

From the little beginning at Newcastle there have sprung up in Canada alone, since 1869, twenty-two extensive Government fish-breeding establishments, and from the practical work performed and the success that has marked the progress in these fish-nurseries up to the present time, they will compare most favorably with all other institutions of the kind either in the new or old world.

In April, 1895, the work under the Department in connection with fish culture, passed from the hands of the official under whose zeal and skill these operations had been started and so long conducted, Mr. Samuel Wilmot, Superintendent of Fish Culture. In the month named Mr. Wilmot retired to the superannuation list. On September 17th, 1895, a report to Council from the Minister of Marine and Fisheries recommended the appointment of an officer, with scientific attainments, possessing skill in marine biology, who could act for the fisheries branch in the same manner as nautical advisers do for the marine branch of the Department. This report was approved, and on October 1st, 1895, Mr. Edward Ernest Prince, B.A., F.L.S., etc., of St. Andrew's Marine Laboratory, Scotland, Professor of Zoology in St. Mungo's College, Glasgow, was appointed Commissioner and General Inspector of Fisheries for Canada. The fish-breeding establishments are now all under his special charge.

Increased attention is being devoted to fish propagation. In 1895 there were only fourteen fish hatcheries, from which were distributed about 200,000,000 fry, while in 1904 there were twenty-two such establishments, and, inclusive of lobsters, but exclusive of black bass, which are reared every season at the Government ponds, Belleville, the quantity of small fish planted in the waters of the Dominion amounted to the large total of 473,258,000, this quantity being exclusive of berried lobsters distributed from the Gabarus pond, Cape Breton. This pond was used for impounding parent seed-lobsters, and over 56,000 large lobsters carrying eggs, were secured by purchase during the open fishing season, and after being impounded until the close season began, were then liberated in the Atlantic waters, where they hatched out their young in the ordinary natural way. This scheme should in a very few seasons be effective in enormously benefiting the waters off Cape Breton. Six new hatcheries are being constructed during the present year, three in British Columbia, two on the Atlantic coast, and one on the inland waters.

The classification of fry distributed during the year 1904 was as follows: Atlantic salmon (salmo saler), 10,888,000; Pacific salmon (Oncerhynchus), 16,056,000; Pacific trout (salmo irideus), 98,000; speckled (salvelinus fontinalis), 141,000; salmon trout (salvelinus namaycush), 2,575,000; pickerel or dore (stizestedion viteum), 24,000,000; lake whitefish (coregonus clupeiformis), 82,500,000, and lobster (homarus americanus), 337,000,000; total, 473,258,000.

A Marine Biological Station is also maintained by the Department some valuable work in the investigation of the spawning, life history and habits of the oyster being carried out. Many tests are also being made in the various methods of oyster cultivation. Mr. Ernest Kemp has been engaged as oyster expert to take charge of the oyster propagation work, and has a specially equipped vessel the "Ostrea" at his command. This work is developing considerably and is of great promise.

CHAPTER XII.

Important Experiments.

A Practical Effort Being Made by the Department to Extend the Canadian Herring Curing Trade.—Attempts to Abate the Dog-Fish Plague.

AMONG many efforts to promote and foster the sea fisheries which have been made during recent years by the Department of Marine and Fisheries, several are fairly entitled to special reference. An important effort of the Department is that now being made to place the Canadian herring fishery on a more satisfactory basis.

It has for some time been realized that Canadian herring do not command the price and favor they would do were more attention paid to the curing and packing by those interested in this important part of the business. It has appeared that the Canadian herring are quite as good as those taken in the Scottish waters, but the fact is familiar with everyone with a knowledge of the trade that the latter can command from 50 to 100 per cent. more money in Canada than the herring caught off the Canadian coast. As a result the Canadian herring fisheries are at present of an annual value of only from two to two and a quarter millions of dollars per annum or less than one-third of the value of the Scottish herring fisheries. Canadian herring being unable to compete with the British and foreign goods in the domestic markets, it is not surprising that herring caught in Canadian waters have in the past been, and still are, practically shut out of the best markets of the world, in which herring from the United Kingdom, from Norway and from Holland, find ready sales at good prices.

While most recognized authorities have expressed the opinion that Canadian herring, in a fresh state, are equal in quality and flavor to any herring caught on the other side of the Atlantic, some on the other hand have maintained that the excellent flavor characteristic of herring caught on the other side of the Atlantic is lacking in the Canadian herring, and that no new methods of curing would gain for them a place in the cured herring markets, in competition with Scotch and other European herring.

The Hon. Mr. Prefontaine, in view of the great importance of the matter, decided that it was well worth while to determine the true facts of the case.

In 1903 active steps were first taken to put the Canadian pickled herring industry on a better basis, in accordance with a detailed scheme prepared by Professor Prince, Fisheries Commissioner. As a first step, a reliable and experienced Scottish curer, Mr. John J. Cowie, of Lossiemouth, Scotland, was authorized to visit Canada, and spend some time at Halifax, Canso, Digby and other ports, making a full inquiry into the existing condition of the pickled herring industry. On completing his preliminary investigation, Mr. Cowie reported that a scheme of improvement was most feasible, and the fishermen, and dealers, indeed, the general population along the coasts visited, evinced the liveliest interest in the steps suggested to be taken.

In the summer of 1904, to prove beyond question, by actual experiment, whether the cause of Canadian herring being debarred from the best markets was to be found in the methods of curing at present in vogue, or in the alleged want of flavor in the fresh herring itself, the Minister authorized and instructed Mr. Cowie to bring to Canada, from Scotland, at the Department's expense, a modern herring fishing steamer with Scotch fishermen, and fully equipped with Scotch herring nets, for the purpose of carrying on deep-sea drift-net fishing for herring off the Canadian coast, in the manner it is carried on round the British Isles. The gentlemen charged with the experiment was further authorized to bring to Canada a small Scottish herring-curing staff, to cure herring with the same grade of salt, and market them in the same class of barrels, as those which are in use in the Scottish fisheries.

The experiments held during the summer and autumn of 1904 conclusively proved, with the assistance of trial sales made in all the

CANADIAN HERRING CURING EXPERIMENT

THE EXPERT CURING STAFF BROUGHT OVER FROM SCOTLAND

chief United States and European markets, that the schools of herring in Canada's Atlantic waters if properly handled, cleaned, cured and barrelled, are equal if not superior to the Norwegian, Scotch and Dutch herring which have such high repute in the markets of the world.

The experiments were continued during the fishing season of 1905 in the Atlantic waters with even more pronounced success, and towards the end of the season the staff brought from Scotland was sent to British Columbia, to make similar experiments and demonstrations there. The herring cured on Vancouver Island, and marketed, have already created a considerable demand, but by the adoption of the superior Scotch methods it is thought that enhanced prices and a more active demand would result.

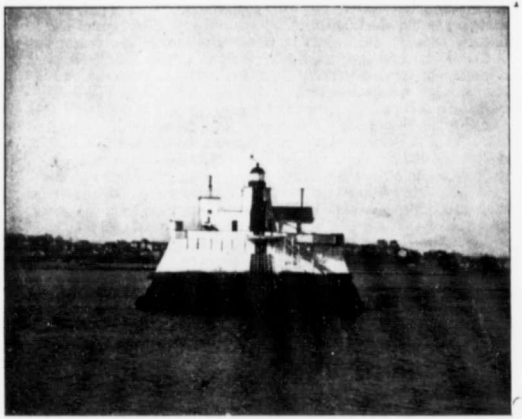
Altogether, as a result of these experiments, a tremendous development of the Canadian herring industry is anticipated. Strange as it may appear, the vast demand in the United States for a superior quality of cured herring has been met not by the fish pickled in Canada; but by herring imported from Norway, the Netherlands, and Scotland. The continent of Europe takes so great a part of the famous Scottish salt herring that only a very small portion can be spared to be exported to the United States markets.

There is a practically unlimited demand for pickled herring of the standard of the best European cured fish. The United States markets cannot obtain more than a fraction of these herring which are required, while Russia, Germany, and many other European countries, not to mention the colonies, Australia, New Zealand, the Straits Settlement, etc., besides our own increasing Canadian needs, all afford a field for the development of a most desirable and remunerative trade. From Stettin, Dantzic, Konigsberg, and other continental centres, inquiries have already come, and as a result of the success of the present experiments, our fishing population have a stimulus to equal or rival the Scottish curers, which has hitherto been apparently wanting.

During the past five or six years widespread alarm has been caused along the Atlantic coasts of Canada and New England by the incursions of hordes of dog-fish and attention drawn to the damage done by these "wolves of the sea" to the commercial fisheries of the maritime provinces by the destruction of fish and damage done to the fishing gear. The dog-fish trouble has occurred before in British and other waters, as well as in those of Canada, but a plague so extensive and general as the one referred to is not of common occurrence. According to Prof. Prince, however, there is no reason to regard the existing scourge as one likely to permanently afflict our fishermen and fishing industries.

In an exhaustive and learned report on the dog-fish, submitted to the Minister by Prof. Prince in 1903, that eminent authority asserts that the term "dog-fish" is carelessly applied to a number of fish, mostly belonging to the shark tribe. They are really small species of shark, differing amongst themselves in points of structure and habit; but all characterized by their small size, rarely more than four or five feet in length, and frequently two or three feet only. In structure, appearance, and habits, they are precisely the same as the large and dreaded sharks of the ocean, differing from them only in the same way that a small terrier or pug-dog differs from a Danish hound or a St. Bernard dog. These small kinds of shark are known as sea-hounds, blue, spined, spotted and smooth dogs, cat-sharks and norse-hounds, chiens-de-mer, etc., and are in all respects like the large sharks, being included in the great Selachioid group of the sub-order Plagiostomata. All the sharks have a rounded cylindrical body, a rough granulated skin, the mouth cross-wise on the under size of the large head, and the tail not fanshaped or divided into two equal lobes; but lengthened out and unsymmetrical in form. Like all the shark tribe the dog-fishes are essentially restless wanderers. They resemble wolves in their habits, roving in great herds or schools, and on account of their voracity and predacious character they soon exhaust the supply of food in limited areas either by devouring or by driving the fish away. No doubt the disappearance of fish accustomed to frequent certain localities may in many cases be attributed to the appearance of dog-fish. Thus they are compelled to move from place to place in search of new supplies of food. So strong is the hunting instinct that while in the infant stage, and barely six inches long, they have been observed hastening in pursuit of schools of large herring much longer than themselves, which they could not have devoured, even if they had secured the frightened fish.

The direct harm that a plague of dog-fish can do is well nigh incredible. Thus in 1882 the pack of cured herring in the Shetland Isles was 134,000 barrels, whereas in 1888, owing to the presence of dog-fish, the total quantity fell to 99,000 barrels, and in 1889, even lower, i.e., not more than 47,000 barrels or only about one-third of the pack two years before, and representing therefore, an enormous total loss. Many similar cases could be instanced; but the facts as they exist to-day in Canada are startling enough. The statement of Mr. Copp, M.P., in the House of Commons, Ottawa, on October 28th, 1903, sufficiently indicates the grave nature of the matter. "The dog-fish have become a serious menace to our fishermen in Nova Scotia," he said. "If the problem is not dealt with in some way it is going to seriously affect the fishing industry of the Dominion. The Halifax *Herald* of October 3rd, shows how the dog-fish is helping to destroy the industry in Nova Scotia. The newspaper tells of 'half a million shortage in our western Nova Scotia fisheries.' It is estimated that west of Halifax (that is in the counties of Lunenburg, Sherbourne, Queen's, Yarmouth and



ST. JOHN, N.B., HARBOR BEACON

PARRSBORO', NOVA SCOTIA, LIGHTHOUSE

Digby), the fishery caught is $400,000 to $600,000 below the average year."

The matter of abating the plague of dog-fish was energetically taken up by the Minister, and the officials of his Department. Opinions as to the best method of dealing with the nuisance appeared to be so diverse that much difficulty arose in deciding how best the government could aid the plague. The Fishery Commission in Gloucester County, N.B., which specially inquired into the matter along the south shore of the Bay des Chaleurs found that the fishermen generally favored a government bounty, and the commissioners, in consequence recommended the payment of an adequate bounty to encourage the fishermen to exterminate the dog-fish. The Commissioner of Fisheries himself favored departmental action through its officers, as the most direct method of coping with the evil, as it appeared that a large bounty could not be offered and the fishermen could not be expected to forsake their ordinary remunerative occupations, and sufficiently exert themselves to capture the schools of dog-fish. A further scheme was the organization of reduction works at certain central points, where valuable products could be manufactured from fish waste, dog-fish, etc. The manufacture of oil and fish fertilizer, fish offal, etc., it was claimed would make possible adequate payment to the fishermen for the dog-fish captured and brought to the reduction works, and the extensive and rapid destruction of the schools of dog-fish would be actively stimulated.

Hence a large building was erected in 1903 at Canso as the first of these government aided reduction works, and a plant manufactured by the American Process Company of New York, installed so that the utilization of dog-fish and fish offal was carried out the following season.

Two other plants were obtained by the government, and reduction works erected the following year.

The use of dog-fish as food has long been recognized in Norway, the Channel Islands, and in the Hebrides and northern islands of Scotland, and, indeed, in Aberdeen, Scotland, dog-fish prepared in various more or less appetizing ways, have found a ready market, and some such scheme is being tried by several parties in the maritime provinces. Recently three or four enterprising lobster packers in Prince County, Prince Edward Island, Cape Breton and Richmond Counties, C.B., and in Shelburne and Digby Counties, Western Nova Scotia, have most successfully put up canned dog-fish, which has even been pronounced by some, in that preserved form, as superior to salmon.

In most markets a prejudice exists against dog-fish, and all such members of the shark tribe, especially amongst our own population, who have such a superabundance of the most excellent kinds of food fishes available in the lakes, rivers and seas of the Dominion. No means, however, of creating a demand for dog-fish products is being neglected in view of the fact, that unless extensive measures be taken, and the wholesale extermination of dog-fish stimulated, this greatest and worst enemy of the fishermen may continue to inflict loss and destruction along our Atlantic shores.

Reference has been made to the Fisheries Commission of 1903-04. This Commission, consisting of six members, viz., Colonel J. J. Tucker, chairman; Mr. A. J. S. Copp, M.P.; Mr. R. E. Armstrong, Mr. E. C. Bowers, the Rev. Father Turbide, and Mr. R. N. Venning (Marine and Fisheries Department) commenced its investigations into certain important sea-fishery problems towards the end of November, 1903.

The Commission was authorized to take evidence on the herring fisheries of the Bay of Fundy, including the sardine fishery of Passamaquoddy Bay, New Brunswick, in addition to certain points of urgent importance in the lobster industry, as well as on the dog-fish pest.

The final report of this Commission may be fairly expected to result in the inauguration of new regulations and experiments looking to the further development of the Dominion Fisheries, for this is an era of action in the Department, and the full establishment of the fact that official action to provide protection to those engaged in reaping the sea harvest of Canada is desirable, is all that is needed to secure the desired remedy, if it can possibly be applied

THE END.

Postscriptum.

AT the very moment of passing the revised proofs of the last chapter, comes the sad news of the sudden demise in Paris, France, of the Honorable J. Raymond Prefontaine, Minister of Marine and Fisheries.

A pre-eminently patriotic son of Canada, the late Honorable Mr. Prefontaine was untiringly energetic in his efforts to advance the progress of the Dominion, in whose great future he had simply an unbounded confidence.

A typical French Canadian, he was, while becomingly proud of his lineage and of all the glorious traditions of the gallant race from which he had sprung, the very living embodiment of the splendid loyalty of his race to British Parliamentary Institutions and to the British Empire. It is no mere figure of speech that London, Ontario, Quebec and Maritime Province papers are using when they state that the Empire, as well as the Dominion, is the loser by the death of such a man in the very prime of life.

The deceased minister was a man of big ideas and tremendous energy. He was a doer of great things, not a mere planner of details. All through his responsible public life, municipal and national, it was but necessary for him to decide in his own mind that something should be done, to forthwith set about doing it, regardless of consequences, particularly to himself. There was no such thing as procrastination in his composition.

By nature optimistic to a degree, he was endued with a faith which was perfectly sublime in the future greatness of Canada and of her chief city, Montreal, over whose destinies he practically presided for many years, first as the virtual leader of the City Council, and later as Mayor. At a comparatively early period of his active career in the Montreal municipal arena, he inaugurated a system of much-needed public improvements, delay in executing which, all must now admit, must have impeded the progress of that city and have had a detrimental effect at a most critical moment upon the development of Canadian Commerce. At the time, and later, there was much criticism of the details of Mr. Prefontaine's projects, the expenditures, particularly, being regarded as extravagant for the city's then financial condition. It has since been pretty generally recognized that if Mr. Prefontaine erred at all in these matters it was due to his sanguine nature—to his absolute, prophetic and contagious confidence in the future greatness of the Dominion and its chief city, and to the natural determination and forcefulness of his character, which rebelled against anything like unnecessary delay in the execution of any project he had set his heart upon seeing accomplished.

The preceding pages convey some idea of the truly exellent and enduring work the deceased minister has done in connection with the Department of Marine and Fisheries, although they were not prepared with that object specially in view, but rather, and that at the wish of Mr. Prefontaine when the project of this publication was brought to his notice, to attract the world's attention to the resources of Canada in the way of water routes and fisheries, and to all the efforts which the Dominion Government had made since Confederation, and was still making, to encourage the development of those resources.

Under the present most distressing circumstances, the writer of this book, who, having had special privileges for closely observing the Honorable Mr. Prefontaine's active public career for twenty-five years, and of appreciating his unassuming patriotism, his broad-mindedness, his frank, manly, generous, cheery disposition, regrets that these pages are not a more fitting literary memorial of the work accomplished by this truly great son of Canada in his capacity of Minister of Marine and Fisheries.

E. J. C.

Ottawa, December 26th, 1905.

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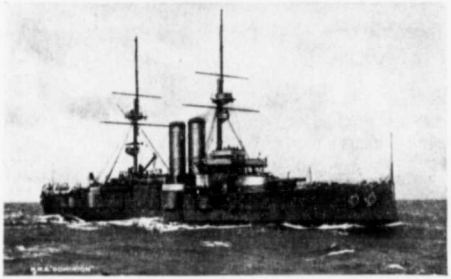

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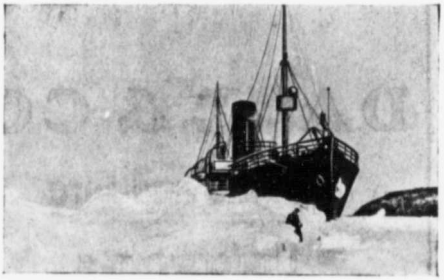

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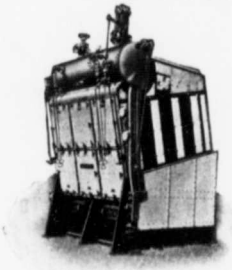

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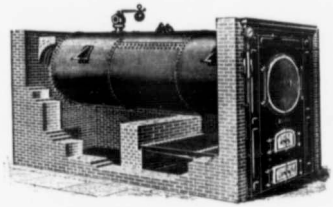

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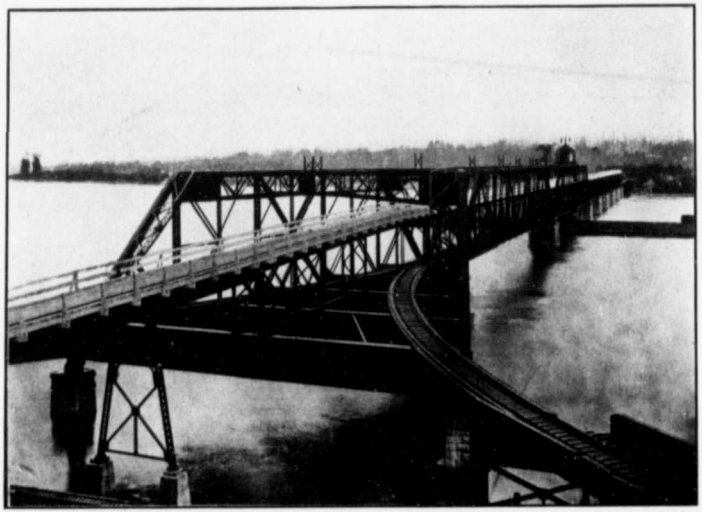

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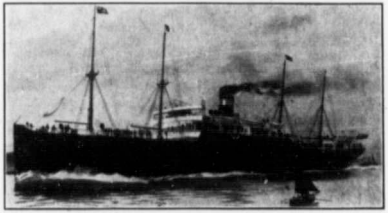

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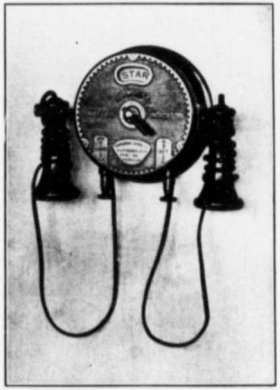

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Mr. E. W. Humphrey, the President of the Canadian Company, has given his personal attention to all the details in connection with this great undertaking and already most gratifying results have been attained. The Head Offices of the Company are located at 160 St. James Street Montreal, and their wireless station in that city is in the Board of Trade building. At Quebec they have a station on the Plains of Abraham, with an office at 28 St. Louis Street. In Ottawa their station is at Rideau Park with an office at 40 Sparks Street.

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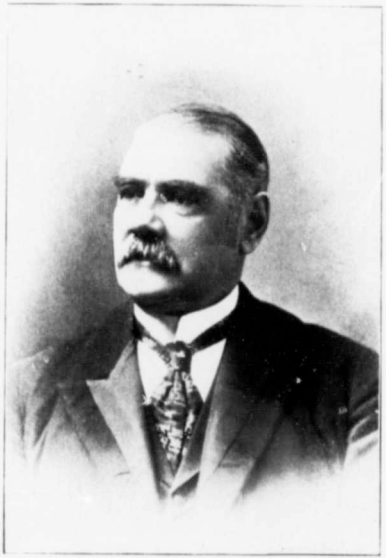

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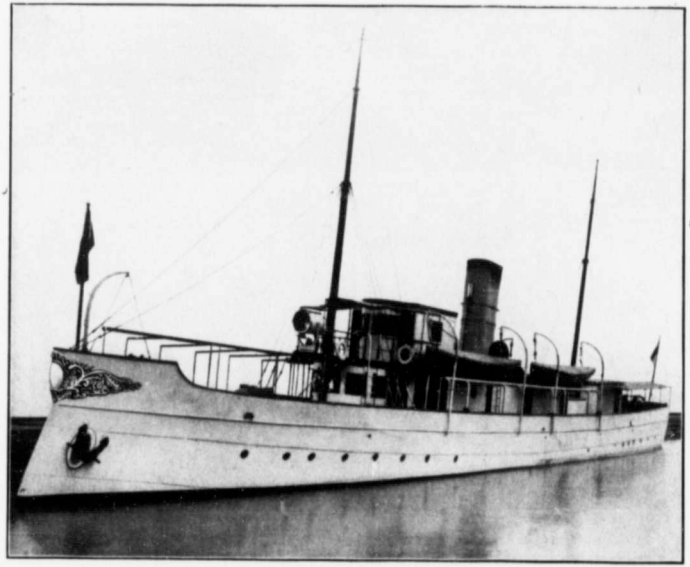

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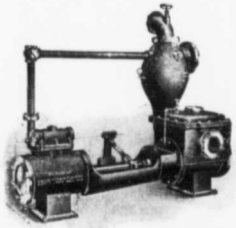

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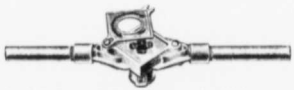

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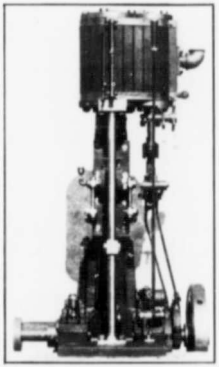

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Stone Dry Dock 514′ 0″ on Keel Blocks. 58′ 0″ Wide Gate Entrance

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: : : on Page XIX : : :

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Office and Works Located at LACHINE LOCKS, P.Q.

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step has been taken by the Marconi Wireless Telegraph Company of Canada. Three more very important stations have been contracted for in Canada. They will be located at Prince Edward Island, Gross Isle and the City of Quebec. With the Atlantic seaboard covered with a network of operating and self-suporting stations, this is the beginning of the chain of stations which will be built across Canada and which will make the Canadian Marconi Company supreme in that territory.

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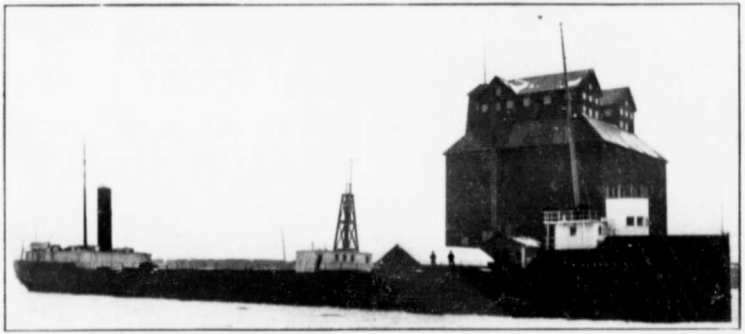
Steam Pumps, Sub. Marine Divers, Jacks, Hawsers, Lighters, etc., Ready on Short Notice.



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Capacity, 3,200 tons.

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Capacity, 9,000 tons.

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Extensive Builders of Wheelock Engines, Corliss Engines, Ideal High Speed Engines, Boilers, Pumps, Flour Mill Machinery, Oatmeal Mill Machinery, Wolf Gyrators, Emery Choppers, Wood Working Machinery, Shingle Machinery, Heading and Stave Machinery, Wood Rim Split Pulleys Iron Pulleys, Shafting, Hangers, Friction Clutch Couplings, Friction Clutch Pulleys, **Safes, Vaults** and **Vault Doors.**

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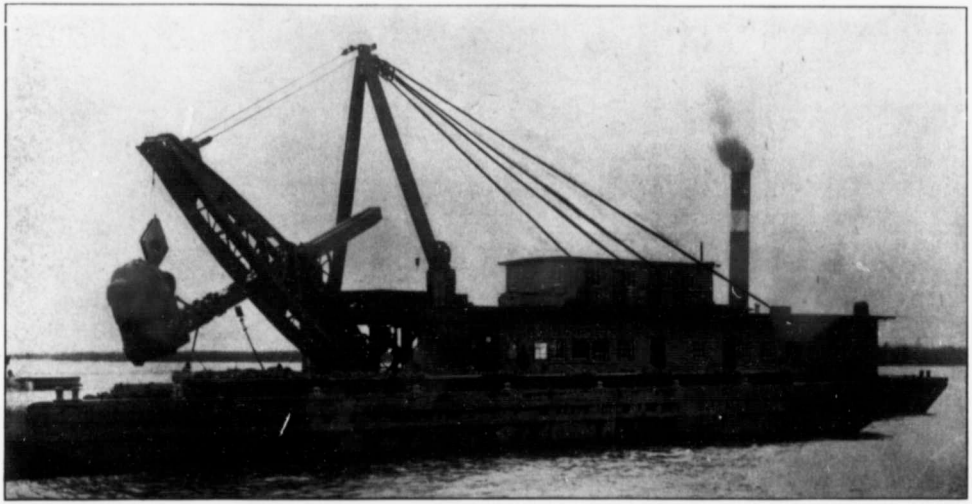

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Largest and most powerful Dipper Dredge in Canada.

Equipped with eight yard dipper and two five hundred yard steel scows.

DREDGES—DIPPERS Nos. 1, 5, 6 and DOMINION HYDRUALIC No. 7

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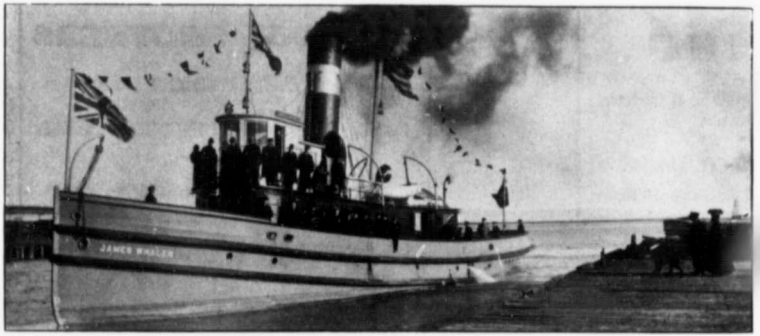

THE WILLSON AUTOMATIC GAS BUOY

AMONG the many noteworthy improvements effected by the Department of Marine and Fisheries during the past few years in the aids to navigation, there is none which promises to have as far-reaching an effect as the invention, exploitation and adoption of the automatic gas buoy.

The invention of the original steamer-tended gas-lighted buoy marked a very considerable advance in the improvement of the recognized aids to navigation. The illuminant of this buoy was an extra refined oil gas, stored in the body of the buoy at very high pressure.

A succeeding step of great importance in the development of the gas buoy was the successful experiment under the auspices of the department of Marine and Fisheries in 1902, to determine the suitability of acetylene for the lighthouse and buoy service.

The advantage of the compressed acetylene buoys over the former oil-gas buoys were as follows :—

(1) For the quantity of gas burned acetylene produced five times the light of the oil-gas.

(2) Acetylene could be generated in a portable apparatus on the deck of a steamer, while oil-gas had to be transported in storeholders from gas works ashore.

(3) Over ten atmospheres pressure more acetylene can be compressed in a holder than oil gas, as the latter begins to deposit liquid hydro-carbon at or before this pressure, thereby reducing the illuminating power of the gas.

The Willson Automatic Gas Buoy, in which the Department of Marine and Fisheries now possesses the means of placing the Canadian buoy service upon an entirely automatic basis, is a product of the ingenuity and skill of Mr. Thomas L. Willson, of Ottawa, whose name is as intimately associated with the practical development of acetylene as an illuminant as is that of Edison with electricity.

This automatic gas buoy carries its own charge of carbide in a generating tube of welded steel and actually produces its own gas as required for consumption.

The development of this invention can be said to have fairly revolutionized gas buoy practice and has had already a far-reaching effect in altering the plans of the Department of Marine and Fisheries for the extension of its service, the new buoy, after an exhaustive series of tests, having been finally adopted as the standard type in the department. All the additions to the gas buoy service of Canada during the season of 1904 were of this type of buoy.

The numerous and important advantages possessed by this buoy over the compression type were given by the Commissioner of Lights, Mr. Fraser, in his annual report for 1904 (blue book page 62), as follows :—

(1) In the compression type the gas is raised to a pressure of 225 pounds per square inch ; in the automatic type the maximum pressure does not exceed a few pounds per square inch.

THE WILLSON AUTOMATIC GAS BUOY—Continued

(2) Compression buoys require for their maintenance a generating and compressing plant. In the case of acetylene this could be placed on the deck of a lighthouse tender or scow; with oil gas it had to be located on shore, and the gas transported in holders to the buoy.

(3) The elimination of compression, and the fact that automatic buoys may be recharged from a small boat, if necessary, permits the installation of gas buoys in isolated positions where it was not practicable before.

(4) An automatic gas buoy, fully charged, can carry from 9,000 to 10,000 feet of gas in the form of carbide. The standard compression buoy (180 cubic feet per atmosphere), at 15 atmospheres will contain about one-quarter as much gas. It is seen that an automatic buoy can be charged at the opening of navigation and will require no attention in so far as gas supply is concerned, until navigation closes, or sufficient, if necessary, for one year.

(5) The adoption of this principle permits the lighting of other classes of buoys, such as whistling and bell buoys.

The automatic system of acetylene gas lighting has been satisfactorily adapted to whistling buoys, Mr. Willson having perfected a very complete type of combination whistling and automatic gas buoy. In the buoys of this type, for the sounding of the whistles, the Courtenay principle, with certain very important modifications, has been adopted. Instead of a single central tube for compressing the air to sound the whistle, as in the old standard whistling buoy, twin tubes are made use of, their axes, and that of the generating tube, being in the same plane.

No less than seven distinct types of automatic gas buoys have been designed by Mr. Willson, three of them being also whistling buoys. The types are distinguished by the numbers 5, 6, 7, 8½, 9, 11 and 11x14½, these numbers representing roundly the diameters of the flotation chambers in feet. The flotation chambers are cylindrical in all the types except the 8½, which is spheroidal in shape, and the 11x14½, which is of elliptical form. The draft of the buoys when fully charged varies from 6 feet in Nos. 5 and 6, to 26 feet 8 inches in the two largest types. The carbide charges vary from 1,000 pounds in the two smallest types, to 3,000 pounds in the three largest. The diameters of the lenses of the lanterns vary from 200 m.m. in the three smallest types to 500 m.m. in the largest, while the height of the focal plane above water varies from 7 feet 4 inches in the two smallest types to 30 feet in the two largest. No. 9 has a whistle 10 inches in diameter, the two larger types being equipped with whistles 18 inches in diameter.

So rapid and successful has the development of the automatic gas buoy been that it is already disputing with the lightship the important place it has hitherto held as an aid to navigation, and the No. 11x14½ type is avowedly designed for positions hitherto considered to be of sufficient importance to call for lightships. Carrying at the height of 30 feet above the water a lantern with a lens of a diameter of 500 m.m., it is practically a lightship or floating lighthouse of an order superior to 75 per cent. of the lighthouses in Canada. And it will show its powerful light and sound its warning whistle without the aid of a crew, or in fact even a single attendant.

The contrast between this powerful and automatically operating aid to navigation and the gas buoy used before the introduction of acetylene, which needed constant attention, was at the best weak in power, serving only a local purpose, and was easily obscured in thick or hazy weather, is simply marvellous.