

219.—THE CANADIAN FISHERIES.

By L. Z. JONCAS.

[Abstract of a paper, read before the British Association for the Advancement of Science at its Montreal meeting, August, 1884.]

The paper begins with some general reference to the importance of the subject, and with a quotation from a report by the Hon. Peter Mitchell, the first minister of marine and fisheries, whose thorough knowledge of every branch of that department, and whose zeal and ability in the application of that knowledge to the performance of his duty as minister, made it one of the most important under the Government. The writer then proceeds to deal with the extent of Canada and of its fisheries: "Bounded by three oceans, on the north by the Arctic, on the east by the Atlantic, and on the west by the Pacific Oceans, it has over 5,500 miles of maritime coast, washed by waters abounding in the most valuable fish of all kinds. Of its numerous inland seas we may mention the Hudson Bay, the Strait—which would be better named a sea—of Davis, the Gulf of Saint Lawrence on the Atlantic Ocean, the Polar Sea, and Baffin's Bay on the Arctic Ocean. We might also mention the Straits of Belleisle, of Canso, and Northumberland, and the Bay of Chaleurs, in the Gulf of Saint Lawrence, the Bay of Fundy between Nova Scotia and New Brunswick, and the Gulf of Georgia between Vancouver and the mainland of British Columbia. In addition to which are the Lakes Superior, Huron, Erie, and Ontario, the largest of many others, great inland seas, the area of which is equal to 27,000 square miles." Mr. Joncas points out that, excluding the great inland seas of the Northwest Territory and the sea-coast of British Columbia, whose fishery resources have not yet been fully developed, the older Provinces of Ontario, Quebec, Nova Scotia, New Brunswick, and Prince Edward Island, have 2,500 miles of sea-coast and inland seas, besides smaller lakes and rivers abounding in fish of great commercial value. "Whether, therefore, we regard them as being abundant and important for domestic use, or in their much larger import as a valuable resource, capable of ever-increasing development and limitless reproduction, employing an amount of capital reckoned by many millions of dollars, and engaging the labor of hundreds of thousands of persons; encouraging maritime pursuits, fostering commercial marine, promoting foreign trade, keeping always and productively in active training an independent spirited class of sea-faring men, the teeming waters of the British-American possessions present to our view a national property richer than any moneyed estimation could express."

Coming to the question of the value of the fisheries, Mr. Joncas claims that they are the richest and most profitable in the world. According to the reports of the fishery department the value of Cana-

dian fish product in 1870 was \$7,573,000; in 1880 it had increased to \$14,500,000, and by the latest report, that for 1883, it had reached \$17,500,000. He points out that although our system of inspection and oversight, and our method of collecting statistics have greatly improved, they are still necessarily imperfect, and do not include the enormous catch which goes on by settlers for their own consumption; and he claims that the \$17,500,000 can be considered as representing only the fish prepared for export or sold on the Canadian markets. He estimates the value of fish caught and consumed by the native population of Manitoba, the Northwest, and British Columbia at \$5,000,000; and of the other provinces of the Dominion at \$14,000,000, making in all the sum of \$36,000,000 as the annual value of the fish exported and used for domestic consumption in the Dominion. The paper then goes on to prove by comparison that "the fisheries of British North America are the most productive of the whole world." In Canada we have 50,000 men regularly employed in the fisheries; their labor, as seen by the last official return, produced fish to the value of \$17,500,000, or \$350 for each fisherman. Great Britain employs 113,640 men, and their labor, according to the figures given by H. R. H. the Duke of Edinburgh, produces 615,000 tons of fish, representing a value of \$35,000,000, or \$309 for each fisherman, a difference in favor of the Canadian of \$41. In the United States are employed 132,000 fishermen, the catch being valued at \$44,500,000, or \$337 per man, a difference in favor of the Canadian fishermen of \$13. It is pointed out that an important part of the \$44,500,000 worth of fish taken by the United States fishermen were caught in Canadian waters. "It must also be noted," Mr. Joncas remarks, "that on account of the severity of our climate our fisheries can only be worked about seven months in the year, from the beginning of April to the end of October, so that the Canadian fisherman earns in seven months \$41 more than the English fisherman, and \$13 more than the fisherman of the United States, who work from January to December."

The conclusion of the writer is that the Canadian fisheries have not yet reached 25 per cent. of their possible development, a fact due in some part to the inferior equipment heretofore employed in the fisheries as compared with that employed in United States and British fisheries. In this respect, however, improvement is taking place. "Owing to the encouragement given by our public men during the last years, the building of Canadian fishing craft has progressed rapidly. The swift schooners of Nova Scotia, New Brunswick, and of the other maritime provinces, can already by their sailing qualities compete fairly with the American fishing vessels, reported to be the best of their class in the world." Reference is made in the paper to the use of the steamers now used in our lakes, in the fisheries, to the sums of money spent by the Government annually in building harbors of refuge and light-houses, and to the bounty of \$150,000 annually given to the encouragement of

the fishermen, and a strong appeal is made for still further encouragement. Replying to the question as to the possible exhaustion of the fisheries by their greater development, the writer states that fresh-water fisheries, such as salmon, trout, whitefish, &c., and the sea shell-fisheries, such as oysters and lobsters, may be with time exhausted by indiscriminate fishing, and he points out that these fisheries should be protected by severe and thoroughly enforced regulations. These regulations are in force in Canada, and are producing good results. He claims, however, without saying that protective regulations are unnecessary in the case of the sea fisheries, those of cod, mackerel, herring, &c., that it is impossible to exhaust them, or even to appreciably lessen their numbers by the means of fishing now in use, especially if protecting them during the spawning season, we are content to fish them from their feeding-grounds; and in proof of this he cites the fact that for 300 years fishing in the Gulf of the Saint Lawrence has been going on without diminishing the supply of fish; on the contrary, every year "millions are added to the millions caught before." It is admitted that in certain localities there may be an apparent decrease at certain seasons, but this is due to accidental causes. "The changes in the migration of fish may be due to the temperature; to the currents or to the disappearance from certain places of those myriads of small fish which serve as food to the cod and other fish. It must also be remembered that fish are erratic in their habits, and that they are plentiful to-day in localities where they had not been seen for many years." The fecundity of cod, herring, and mackerel negatives the idea of exhaustion, and reference is made to the report of the royal commission, presided over by Professor Huxley, as establishing the same fact. The law of compensation in nature, by which portions of the world more favored for agriculture by climatic conditions, are compensated for in our northern climes by immense fish preserves, the great fishing interests being, as stated by Hervey, "dependent on the Arctic current as the farming interest is on the rain and sunshine which ripen the crops." The Arctic seas and the great rivers which they send forth are swarming with minute forms of life, constituting, in the words of Professor Hind, in many places a living mass, a vast ocean of living slime; and the all-pervading life which exists there affords the true solution of the problem which has so often presented itself to those engaged in the sea fisheries, where the food comes from which gives sustenance to the countless millions of fish which swarm in the waters of Labrador and Newfoundland and in the Dominion and United States waters. It is computed that while the cold water area subtending the coast of the United States is about 45,000 square miles, that subtending the British American shores is 200,000 square miles, a proof of the superior value of the British North American fisheries. Only one-half of our 5,000 miles of sea-coast has been properly worked. The most important of the deep-sea fishing grounds are the Atlantic coast of Nova Scotia

from the Bay of Fundy round the southern part, around the coasts of Cape Breton, New Brunswick, and Prince Edward Island, embrace the Bay of Chaleurs and the Gaspé coast, and extend to the island of Anticosti, the Labrador, and the Magdalen Islands, and along this coast the cod, the herring, the mackerel, the lobster, and numerous other fisheries of less importance are carried on successfully.

THE COD-FISHERY.—Last year the catch amounted to 1,611,586 quintals, valued at \$6,366,000, adding to which cod sounds and cod oil to the value of \$225,555, we have a total, as the value of the cod-fishery last year of \$6,591,555, divided as follows:

Nova Scotia	\$3, 977, 599
Quebec	1, 778, 290
New Brunswick	716, 496
Prince Edward Island	119, 170
Total	<u>6, 591, 555</u>

And in this sum is not included the quantity consumed by the twenty thousand families engaged in this industry. The cod-fishing season varies somewhat in the different provinces, but may be said generally to be from April to November inclusive. Some interesting particulars are given as to the mode of carrying on the cod-fishing, especially as to the catching of the caplin as bait, it being stated, as illustrating the immense shoals of caplin that fill the bays, "that a man standing in-shore, with a casting net, will often fill a cart in less than an hour; with small seines a couple of men can fill a small boat in about the same time." These caplin are of considerable commercial value. On the disappearance of the caplin about the end of June, the launce, the herring, the mackerel, the squid, the smelt, the clam, &c., are used as bait. The cod being mostly taken by hand lines and set lines, the cost of bait is great, being estimated at one-fourth the value of the cod taken. With the view of decreasing this proportion, the example of Norway, where the gill-net is largely used in the cod-fishery, is recommended to be followed. It is found to be much more profitable than fishing with set lines or bultows. The cod-fishing is carried on in Canada either in vessels of a tonnage of from 60 to 100 tons on the Great Banks or in open boats at a few miles from the shores. Vessels employed in the fishery are manned by from ten to thirteen men, the owner of the schooner, who also supplies all necessary fishing tackle, receiving half the catch. In Quebec and Prince Edward Island the fishing is carried on chiefly in open boats, and hence at great disadvantage, so much so that the reports show a noticeable diminution in the quantity of fish caught in the Province of Quebec during recent years, a fact which induces Mr. Joncas to urge very strongly improvements in fishing vessels and gear, and the abandonment of the vicious supplying system by which advances in food and clothing are made to the fishermen at the

commencement of each season, leaving, as it does, the fishermen almost constantly in debt. The principal markets for dry codfish are Italy, Spain, Portugal, Brazil, British and Spanish West Indies, and the United States. The finest cod in all America, it is claimed, is cured on the coast of Gaspé, in the Province of Quebec, where the effects of the mists generated by the Gulf Stream are least felt. According to latest statistics, the West Indies paid us for dried codfish \$2,000,000, United States over \$500,000, Brazil \$500,000, Europe \$500,000, and British Guiana \$250,000. The incidents of the cod-fishing are very valuable. Oil is taken from the liver; the head, tongue, and sounds form a good article of food; the offal and bones are converted into an excellent fertilizer; the roes are used as a bait for the sardine fisheries of France and Spain, and the swimming bladder is converted into isinglass. Great regret is expressed by the writer at the absence of enterprise in the Province of Quebec for the utilization of these incidents of the cod-fisheries, and some interesting facts are given in order to prove how valuable a resource they might be made.

THE HERRING FISHERY.—This, excluding local consumption, and the quantity used for bait, was valued at \$2,136,000. This sum, although considerable, represents only to a small extent what this industry is capable of in the matter of development. In the Province of Quebec, with its ten thousand fishermen, 1,100 miles of maritime coast, numerous bays, famous for their abundance of herring, the annual export of herring does not reach 2,000 barrels. The writer's opinion is that the export of herring, if the industry was properly encouraged by capital and developed, would easily reach from \$5,000,000 to \$6,000,000 annually, and he bases this opinion upon an examination of what has been and is being done in Great Britain, France, Holland, and other countries. As soon as the ice disappears in the spring the herring come in in immense shoals. Those caught early in the season are less valuable than are those caught between the months of August and December. The former are sent chiefly to the West Indies, the latter, carefully gutted, are packed for the United States and European markets, the best being the celebrated Labrador herring.

The following was the export of herring in 1882 :

Pickled, 423,042 barrels	\$1, 739, 943
Smoked, 1,060,416 boxes	311, 807
Fresh, 16,050,000 pounds	83, 533
	2, 135, 383

THE MACKEREL FISHERY.—This fishery in Nova Scotia and New Brunswick particularly is steadily improving, the class of vessels now used bearing fair comparison with those used by American fishermen, which are said to be the finest in the world. The Quebec fishermen have, however, given but little attention to the mackerel fishing. "The mackerel is met with off the coast of Nova Scotia, in the Bay of

Fundy, in the Gulf of Canso, but nowhere is it more plentiful than in the Gulf of Saint Lawrence, off the coast of Prince Edward Island, in the Bay of Chaleurs, and in the numerous coves and bays formed by the group of islands called Magdalen Islands." The chief market for our mackerel is found in the United States, although some are sent to Great Britain and the West Indies. The annual value of the mackerel fishery, according to recent returns, is \$1,250,000.

LOBSTERS.—The development of the lobster canning business has been very great in recent years. In Prince Edward Island there was in 1871 only one establishment; ten years later the number had increased to 120. There were put up on the island in 1871, 6,711 cans; in 1878, 1,649,800 cans, and in 1882, 6,300,000 cans. In 1870 New Brunswick had one canning establishment, putting up 20,000 cans, ten years later 6,000,000 were exported from the province to different markets. Nova Scotia exported 30,000 cans of lobsters in 1870, and 5,000,000 in 1882. Quebec is behind in this industry as well, producing last year but 800,000 cans of lobsters. There are to-day in Canada 600 establishments engaged in canning lobsters, the product of which is 17,500,000 cans, valued at \$3,000,000, almost as much as the value of the product of our herring and mackerel fisheries combined. These figures represent 52,500,000 lobsters taken in Canadian waters in 1882. The number of lobsters taken in England does not represent 3,000,000 in each year. The ease with which the shell fisheries may be exhausted and the difficulty of reviving them has induced the Government to impose regulations for the prevention of indiscriminate fishing of the lobster on our coasts.

THE FRESH-WATER FISHERIES.—Coming to the fresh-water fisheries Mr. Joncas deals first with the salmon fisheries, and states that they show a tendency to gradual decrease, and this in spite of the regulations made by the Government limiting the fishing season, prescribing the implements that may be used, and providing by artificial breeding establishments, at great cost, for the replenishing of the rivers. He urges, without reflecting upon the devotion and intelligence of the present fishery overseers and guardians, that more should be appointed, and a more constant and effective protection thus afforded; and he urges moreover, that the angler, who indulges in fly fishing for sport, should be required to stop at the same time as the fisherman who fishes for a living is compelled to take up his nets. The salmon fishery, however, is far from exhausted. In 1882 Canada exported salmon, fresh, canned, and pickled to the value of \$3,000,000. The United States is the principal market for fresh salmon and Great Britain of salmon preserved in tins. British Columbia is the most famous of the provinces for its salmon fishery, the industry having already assumed large proportions. In 1879 the catch was 3,000,000 pounds; in 1882 it had increased to 12,000,000 pounds. The capital invested in the salmon fishery of British Columbia is estimated at over \$2,000,000. In addition to the canned

salmon exported from British Columbia over 5,000 barrels of salted salmon have also been exported, the demand for the fish thus preserved being steadily increasing. Trout of all kinds abound in many Canadian rivers, and the best are the sea-trout and the salmon-trout. Whitefish and trout fisheries are carried on on a large scale chiefly in the lakes of Ontario. These lakes are properly called great inland seas, Superior covering an area of 31,000 square miles, and Erie, Huron, and Ontario combined, 52,000 square miles. Many rivers empty their waters into these lakes, and these abound in food-fish, the delicacy and flavor of which are well known; salmon-trout, whitefish, sturgeon, pickerel, pike, bass, perch, &c., abound in them. The fishermen of the Canadian lakes use gill-nets and trap-nets, and their vessels are either sailing boats of from 20 to 30 feet in length, or small steamers called fishing tugs, one advantage of the latter being the speed with which fish can be conveyed to railway stations to be transported in refrigerators to market. The produce of whitefish, trout, &c., from the lakes in 1882 was 4,500,000 pounds, sent fresh to market, besides 5,079 barrels of the same fish salted, 9,753 barrels of trout, and 41,380 barrels sturgeon, bass, pike, mukallonge, and other fish, making a total of 56,197 barrels, or a total of 15,739,700 pounds as the marketed products of the lake and river fisheries. There are besides these the river fisheries of the maritime provinces, giving an aggregate value for the fresh-water fishes of the Dominion of \$4,000,000. The paper closes with some reference to the general commercial value of the fisheries, it being claimed that "the fisheries are not only important to us in consequence of the vast amount of wealth that can be drawn from the deep, apparently without diminishing or exhausting its source, but because by this means a body of able and hardy seamen may be found to conduct the commerce of a maritime country during peace and to become its gallant defenders on the ocean in time of war."

220.—ON THE ABUNDANCE OF HALIBUT NEAR ICELAND.

By Capt. J. W. COLLINS.

While in England, in the summer of 1880, after leaving the Berlin Fishery Exhibition, I was told by English fishermen, sailing from Grimsby, that they had often found halibut in extraordinary abundance while fishing for cod at Iceland. I was much interested in these statements, first because Capt. John S. McQuinn, of Gloucester, went to Iceland in the schooner *Mambrino Chief*, in 1873, on a "salt halibut" trip, and failed to get a fare—a result which until now has prevented other Gloucester fishermen from visiting that locality; and second, because I knew that, if halibut are as abundant in the waters around Iceland as they were represented to be by the Grimsby fishermen, Amer-