

# FISHERIES NEWS BULLETIN

Minister:  
Hon. EDGAR N. RHODES, M.P.

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## INVESTIGATORS FIND FEW COMMERCIAL FISH IN THE WATERS OF HUDSON BAY

### None taken by Departmental Expedition in Deep Waters of Bay and Investigator Makes Only Small Catches in Churchill River Area

Investigations conducted in Hudson Bay during the past summer under the auspices of the Dominion Department of Fisheries indicated that fish are not present in commercial quantities in the deep waters of the bay itself or in the Churchill River tributary to the bay.

In twenty-two days' fishing in the bay, the expedition, which was directed by H. B. Hachey, of the staff of the Biological Board of Canada, as Officer in Charge, did not take a single commercial fish, while in Hudson Strait the great depths encountered prevented trawling operations. In the investigation at Churchill, which was in charge of S. J. Walker, Supervisor of Fish Culture, Central Division, for the Department of Fisheries, only 352 edible fish were taken in netting operations which were carried on almost daily from July 16 to September 9.

In the investigation in the bay fishing was done with an otter trawl from the trawler *Loubyrne*, but fishing by hand lines, long lines, and drift nets was also tried. In the investigation at the Churchill area Mr. Walker's party nets of varying mesh size and varying depth were used.

#### *In the Bay*

The *Loubyrne* expedition, which set out from Halifax on July 26, travelled about 8,000 nautical miles, and of this distance some 3,100 miles were covered in occupying the various stations for the purposes of the investigation. "Hand lines were used at several points for seven hours and fifteen minutes," says Mr. Hachey in his preliminary report. "Drift nets were used for twelve hours. Long lines were used for two hours and fifty-five minutes, and trawling operations were carried on for fifty-seven hours and fifty minutes. As a result of the total work covering the whole of Hudson Bay not a single commercial fish was taken."

In addition to carrying on fishing, the *Loubyrne* party also investigated the biological, chemical, and physical condition of the bay waters. Water samples were taken for examination and study, water temperatures were studied, and drift bottles were set out for the purpose of mapping the prevailing surface water movements. "A cursory examination of the material collected and the data noted," Mr. Hachey reports, "suggests that the waters of Hudson Bay are similar to the unproductive waters of much higher latitudes."

#### *Churchill Investigation*

In the Churchill investigation Mr. Walker had with him two experienced gill net fishermen. Fishing was carried on at various points on both shores of the Churchill River for a distance of six miles upstream. Some was also done on the shore of Hudson Bay proper, near the Churchill wireless station. Two strings of nets of varying size of mesh were ordinarily used. The nets had meshes of two, three, three and a half, four, four and a half, five, five and a half, and six inches, and were four, six and eight feet deep. The method of operation followed was the "dry land" plan, similar to that used in some parts of Scotland; that is, the nets were spread on the beach when the tide was out and the tide, rising, raised the cork lines and held the nets upright. Drifting was attempted twice during slack water but did not prove feasible.

"Our total catch," says Mr. Walker's report, "was as follows: Whitefish, 191, average length 14 inches, average weight  $\frac{1}{2}$  of a pound to a pound; herring, 58, average length 7 inches, average weight 4 to 5 ounces; cisco, 91, average length 14 inches, average weight  $\frac{1}{2}$  of a pound to a pound; trout, 10, two, approximately 26 inches long, weighed 4 $\frac{1}{2}$

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## FIND GOOD HERRING FOR SCOTCH CURING

### Interesting Incidental Result in Bait Investigations in Northern B.C.

Investigations made under the auspices of the Dominion Department of Fisheries this summer into the question of bait supply for the halibut fishery in Northern British Columbia waters had the interesting incidental result of establishing the presence off the west coast of the Queen Charlotte Islands of herring of a type apparently well suited for use in Scotch-curing and kippering.

In Inskip Channel approximately thirty-two tons of these herring were taken in three days in the latter part of June, without maximum catching effort, and the fish were generally large and of superior quality. Speaking out of knowledge gained in this area on previous occasions, the investigator, Robert Lloyd, states that these herring are also obtainable in July, August, and September in Inskip Channel and other bays and inlets in this vicinity on the west coast of the Queen Charlottes.

The investigations were undertaken by the department at the instance of the halibut fishermen of Northern British Columbia for the purpose of determining whether or not a regular supply of bait herring could be obtained during the summer months, since fresh bait is superior to that which has been frozen. In this regard, however, the investigations' results were disappointing. Herring were found, of course, but in most cases they were small and unsuitable for bait, and the schools appeared only irregularly; where suitable bait fish were located it was in areas off the halibut vessels' path or in areas where satisfactory sites for pounds could not be found within reasonable distance of the seining grounds, and when the herring were towed in the seine any long distance for impounding the scales rubbed off and disease ensued.

Mr. Lloyd, an experienced fisherman, carried on the investigations in the

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## BIG GAIN IN PACIFIC SALMON CATCH IN OCTOBER BUT MOST FISHERIES OFF

### Values Also Show Decrease and Landed Return to Dominions Sea Fishermen Under Figures for October Last Year

Reports to the Dominion Department of Fisheries show that Pacific coast landings of sea fish in October were larger than in the same month of last year but on the Atlantic coast the catch was smaller than a year ago so that for the Dominion as a whole there was a decrease in sea fish landings during the month and a decrease in the landed value of the catch to the fishermen.

Total sea fish catch for the Dominion for the month was approximately 93,600,000 pounds as compared with 104,522,500 pounds in October, 1929, and landed value was about \$1,550,000 as against the earlier \$2,606,362. All the returns for October, 1930, however, are yet subject to revision.

In British Columbia a greatly increased salmon catch was the major factor in lifting the month's landings approximately 4,115,000 pounds above the figures for October, 1929, or to a total of more than 73,000,000 pounds. The gain in salmon landings more than offset decreased takings in the pilchard, herring, and halibut fisheries. British Columbia landed value for the month, however, was more than \$700,000 below the figures for the preceding October—\$1,139,000 as compared with \$1,885,790.

On the Atlantic coast there were decreased catches in all the provinces except Prince Edward Island, and total catch was about 20,590,000 pounds as against 35,576,300 pounds in October, 1929, while landed value was \$406,000 as against \$720,572. On many parts of the Atlantic coast fish were reported scarce during the month.

#### *Atlantic Operations*

In Nova Scotia all the principal fisheries were less successful than a year ago, save the mackerel fishery. The mackerel fishermen did much better than a year ago, increasing their catch to 576,200 pounds—not very far short of a gain of 100 per cent—and obtaining \$25,435 in landed value as compared with \$16,708. Cod, haddock, hake and cusk, halibut, herring and pollock all fell off in catch and landed value. The total landings of all sea fish for the province for the month were 9,265,000 pounds, or about 3,900,000 pounds less

than a year ago, and landed value was \$198,555 as compared with \$292,862. In New Brunswick there were smaller landings generally, and a total catch of a little under 7,200,000 pounds was less than half as large as the catch in October of last year. Landed value totalled \$98,415 as compared with \$252,302. The catch in New Brunswick's sardine fishery, one of the most important of eastern fisheries, showed a big decrease and was only 10,088 barrels as against more than 42,000 in October, 1929. Quebec's sea fish landings for the month were approximately 2,990,000 pounds as compared with 5,980,000 pounds in the preceding October. Landed value amounted to some \$67,000, a drop of more than \$60,000.

In Prince Edward Island, on the other hand, the landings for the month were more than 1,132,000 pounds, a gain of over 140,000 pounds. Landed value, however, fell off slightly—\$41,905 as compared with \$44,794. The mackerel catch more than doubled and the cod fishery was also more successful than last year.

The lobster landings also showed increase in Prince Edward Island, although in New Brunswick, the largest October producer, there was a decrease, and there was a decrease, too, in Nova Scotia. In the three provinces the lobster catch totalled 610,100 pounds, a decrease of about 68,000 pounds. Prices were less satisfactory than last year and the catch for the month had a landed value of only \$36,715 as compared with \$61,250 in October, 1929.

#### *On the Pacific Coast*

British Columbia's catch of halibut was only slightly smaller than in the previous October—2,960,600 pounds as against 3,034,200—but there was a sharp drop in landed value which was \$307,515 or about \$104,000 less than in the 1929 month. In the case of the pilchard fishery there was a great reduction in catch and landed value. Catch was 4,206,000 pounds whereas, a year ago, it was over 18,300,000 pounds. Pilchard landed value for the month was \$21,050 as compared with \$110,318 last year. Herring catch and landed value

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## OCTOPUS ADD VARIETY IN CANADA'S FISHING

Perhaps few Canadians are aware of the fact but the octopus is among the fishes taken in the commercial fishery in the Pacific coast waters of the Dominion. There's a wonderful variety, indeed, in Canada's fisheries resources. In 1928, to cite some recent figures, British Columbia fishermen landed over 55,000 pounds of the strange looking, eight armed octopus and in 1929 more than 28,000 pounds. The fish are eaten chiefly by Orientals in the province and bring between five and ten cents a pound on the market.

No fishing for octopi alone is carried on but the fish are the incidental product of other fishing operations. For the most part, they are taken in the nets of small druggers.

Over 3,700 pounds of caviar was produced in Canada last year from sturgeon roe. Its market value was a dollar a pound.

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pounds, the balance (8) were of 12 inches average length and an average weight of a pound; common pike, 1, length 27 inches, weight 4½ pounds; a large quantity of sculpin, and one black cod approximately 12 inches long and 1 pound in weight." Several small, unidentified, inedible fish were picked up on the harbour beach, one of them apparently a caplin, and were sent to the Biological Board for identification. Mr. Walker was informed at Churchill that "very large schools of these small fish (presumably caplin) have been observed in the harbour in other years but apart from the one picked up on the beach none were seen this summer."

From his experience and observation at Churchill, and from information he gathered from others, Mr. Walker was led to the conclusion that the following four factors stand in the way of commercial fishing in the Churchill River in the vicinity of the harbour and for six miles from the mouth: Absence of edible fish in commercial quantities; the heavy current which makes it "practically impossible" to hold stationary nets; the presence of numerous white whales, precluding the use of drift nets; and the nature of the bottom and shores, many boulders making seining apparently not feasible.

## OVER 4,500,000 GALLONS OF FISH OIL MARKETED BY DOMINION IN PAST YEAR

### Fish Meal and Oil Production on Increased Scale— Important Development in Canadian Fisheries Progress in Recent Years

Over 4,400,000 gallons of fish oil, exclusive of medicinal cod liver oil, and more than 22,700 tons of fish meal were produced in the fisheries by-products industry in Canada last year, according to returns made to the Dominion Department of Fisheries.

Including medicinal cod liver oil (91,022 gallons), the oil output totalled 4,506,316 gallons and had a marketed value of \$1,845,000, in round figures, while the fish meal production had a marketed value of \$1,013,000.

Expansion of the production of fish meal and oil has been one of the noteworthy developments in connection with the Dominion's fisheries operations in recent years, and further expansion may apparently be expected.

The larger part of the annual production of fish meal, a commodity which is of exceptional value as a food for poultry and live stock, is exported to the United States, Germany, Japan, and the Netherlands. Much of the fish oil, which is used in paint manufacture and for a variety of other commercial purposes, is also exported, going to the United Kingdom, the United States, and the Netherlands.

Pilchards are the largest source of supply for raw material for use in the production of fish oil and meal. These fish are taken in British Columbia waters only, so far as Canada is concerned, and their use for by-product purposes has rapidly reached large-scale proportions in the few years since their utilization in this way was first permitted. Last year the output of pilchard oil was over 2,856,000 gallons with a value, on the market, of something more than \$1,128,000. Pilchard meal production amounted to 15,826 tons with a marketed value of nearly \$657,000. Whale oil production in the province last year totalled approximately 713,000 gallons, and there was also some use of herring, greyfish, etc., in manufacturing oil and meal in British Columbia. On the Atlantic coast the herring and cod fisheries are the principal sources of supply for material used in reduction plants. Medicinal cod liver oil is produced on the Atlantic coast only and is of a quality which puts it in ready demand.

#### Book on Fish Meal

It is only in comparatively recent years that fish meal has come into use as a feeding material for live stock, but it has proved of such value for this purpose that it is being used by cattle, swine, and poultry raisers in increasing quantity. Its utilization in this way has been the subject of study by various experts, and among the pamphlets which have been prepared is one which will be published shortly by the United States Bureau of Fisheries, a bulletin entitled "Fish Meal in Animal Feeding, with Bibliography," by John Ruel Manning, Technologist of the Bureau. When issued, this publication may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a very nominal price; and in quantity it may be secured at a reduced rate. This document should be of interest not only to persons in the fishery industries and producers of fish meals and shell-fish meals, but also to bio-chemists and other research workers in this field, and to animal feeders and those interested in animal nutrition in general. It contains as complete a bibliography as could be assembled, together with non-critical comments and abstracts of the references contained therein. The general nutritive properties of fish meal are discussed in detail. The results of experimental feeding of farm animals, as well as the work done with laboratory animals, are included in this document. The methods of feeding fish meal, and the proportions or percentages of fish meal in the rations of various farm animals, recommended by the best authorities, and many other principles of practice of vital interest to the farmer are set forth.

Under agreements approved by Parliament the administration of the fisheries of the Prairie Provinces is now in the hands of the respective provincial governments. Until this year these fisheries were under federal control.

Ontario's fisheries production in 1929 had a value of approximately \$3,920,000. The province is first among Inland Fisheries territories in annual fisheries return.

## ONCE MONEY, SEAWEED NOW INDIANS' FOOD

Ask Canada's Pacific coast Indians to name the foods obtainable from the waters of the Dominion and they will probably put seaweed in the list.

In earlier years seaweed was "money" among British Columbia Indians in the sense that it was used, to a limited extent, as a medium of barter between northern interior tribes and other tribes living along the coast. This barter has now practically disappeared but if seaweed is no longer money it remains in use as an article of Indian food. For food purposes, especially among the Indians of the northern coast of the province, the seaweed is pressed and partially dried, and in this form it will apparently remain in a satisfactory condition for a considerable length of time. Part of its value from the dietary standpoint is doubtless due to its content of iodine, an element which research has shown to be valuable as a preventative of such diseases as goitre. Incidentally, it may be noted that sea fish also contain a considerable percentage of iodine and this is one of the reasons why doctors and dietitians recommend frequent inclusion of fish foods in the household menu.

As a matter of fact, of course, certain seaweeds are eaten by other people besides Indians. For instance, numbers of people in Canada and elsewhere like dried dulse, a variety of seaweed, and in 1929 Canadian producers marketed over 100,000 pounds of this marine product and received for it a little more than \$10,600. On Canada's Atlantic coast some use has been made of seaweed, in combination with fish offal, in producing fish meal, which is a valuable stock food. So far there has been no commercial utilization of seaweeds on the Pacific coast of the Dominion.

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also showed decrease. Landings were some 7,000,000 pounds less than a year ago and landed value was \$57,085 as against \$238,921.

In the salmon fishery there was a very great increase in catch but price decline operated to prevent a gain in the landed value total. A comparison of results of the salmon fishery for October, 1929, and October, 1930, is as follows:—

	October 1929	October 1930
Catch... .. lbs.	29,547,900	54,847,300
Landed value. . .	\$701,955	\$1,068,585

## BRITISH COLUMBIA'S PRODUCTION OF CANNED SALMON AT NEW HIGH LEVEL

### Output up to November 1st Well Beyond Total for Full Record Year, 1926—Satisfactory Runs of Sockeye Gratifying Feature of Season

With a pack which will probably total about 2,175,000 cases, the British Columbia production of canned salmon in 1930 is setting a new record for the province.

Figures covering production up to November 1 show that slightly more than 2,139,000 cases had been canned, or approximately 817,000 cases more than were put up in the corresponding period of 1929 and some 74,000 cases more than the total output in 1926, the year of previous record pack. Reports for subsequent weeks should make the 1930 pack approximately 2,175,000 cases.

Statements forwarded to the Dominion Department of Fisheries by its chief officer in British Columbia, the Chief Supervisor of Fisheries, Vancouver, show that the unprecedented production this year has been mainly traceable to the remarkable abundance of pinks and the gratifying runs of sockeye. The production of canned pinks up to November 1 totalled nearly 1,091,000 cases, or almost 200,000 cases above the record output for the full year 1926. The sockeye runs to all the principal areas have been very satisfactory this year, producing 463,867 cases—the best showing since 1915. When returns for the year's operations are complete the production of canned cohoes will probably be less than 150,000 cases, or somewhat under the average pack of the past few years, but there is increasing use of cohoes in the fresh fish trade. The output of canned springs, another type of salmon which is being increasingly used in the fresh fish field, was 36,481 cases on November 1, or more than double the output up to the corresponding date in 1929. The pack of bluebacks is never large but the output at November 1, 41,836 cases, was nearly 17,000 cases larger than the output up to approximately the same date a year ago. Steelhead production, always small, was well ahead of the 1929 and 1928 figures.

While all the sockeye areas have had satisfactory runs, this condition was especially noteworthy in the Nass, Skeena, and Fraser areas. The runs were considerably larger than in 1925 and 1926, which may be considered the "brood" years. In the Fraser River

district the yield was greater than in any year since 1917 and again was made up largely of the "late run" type of fish which first made appearance in 1926.

Conservation needs have been carefully observed during the year, and preliminary inspections of spawning areas indicate that the escapement of parent fish has, generally, been very satisfactory.

## DIVERS "CATCH" FISH OFF CANADA'S COAST

There's a wide variety of methods and equipment used in Canada's commercial fisheries, but perhaps a good many people will be surprised to know that diving and diving suits should be included in the lists.

Divers in diving suits gather abalone every year from the ocean bottom off Jedway in the Queen Charlotte Islands, British Columbia, and canned abalone from Canada are marketed in the Orient. In 1929, for instance, 578 barrels of these shellfish were gathered and canned, bringing a price equivalent to \$10 a barrel. Jedway is as present the only place in British Columbia where the abalone fishery is carried on, and the number engaged in it is not large.

The abalone is a shellfish having only one shell, and sometimes reaches a size of six inches and a weight of upwards of two pounds. The edible part of the fish is the foot, or muscle, with which it holds itself to the rocks with much tenacity. While the British Columbia catch of abalone is canned and sold in the Orient, the fish may also be fried, or, if flaked, it may be used in any one of several dishes. It is used in these ways in considerable quantity in the United States.

Fishing for abalone in British Columbia is usually done from small gasoline boats which carry crews of four or five men. Each boat is equipped with an air pump which supplies air to the diver. The diver gathers the abalone on the ocean bottom and places them in buckets which are pulled up by the men in the boat.

## FIND GOOD HERRING FOR SCOTCH CURING—*Cont.*

period from May until the closing days of August, using a purse seine boat. A representative of the Canadian Halibut Fishing Vessel Owners' Association, Prince Rupert, accompanied Mr. Lloyd until the end of July and then was withdrawn by his organization. The association expressed satisfaction with the manner in which the investigations were conducted but was disappointed at the results.

"Prospecting" carried on in waters fairly close to Prince Rupert—from the southern end of Estevan Island to Portland Inlet—resulted in nothing more than three catches, at Freeman Pass and Butler Cove, totalling about 300 pounds of thin fish each. The fish softened quickly after being taken from the water, unless iced immediately, and soft herring are of no use for halibut bait. Other observations on the eastern side of Hecate Strait in July and August sometimes revealed fairly large quantities of herring, sometimes very few; always, however, the fish were too small for satisfactory bait use. In mid-July a pound was established at Butler Cove but several days of observation disclosed nothing but the smaller variety of fish, save for occasional schools of apparently larger herring which were too far away for impounding.

Both off the west coast of Moresby Island and Langara (North) Island in the Queen Charlottes herring were taken, but Moresby is not on the halibut boats' path and at Langara there was lack of suitable sites for pounds. At Langara, which lies at the north-west end of the Queen Charlotte group, several halibut vessels baited from the seine, and a small quantity of the herring taken by Mr. Lloyd were iced and disposed of at Prince Rupert. To secure a regular bait supply at Langara it would be necessary to operate a seine boat continuously and bait the halibut vessels direct from the seine.

H. C. Lewis has resigned the position of Supervisor of Fisheries for District No. 3, Nova Scotia (Western Nova Scotia). H. H. Marshall is acting supervisor.

Vessels, boats, and gear to the value of nearly \$4,160,000 were employed in the New Brunswick fisheries last year. The capital investment in the fish curing and canning plants in the province—155 plants—was \$1,733,000.

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## ADULT SOCKEYE MOVED BY HUNDREDS TO NEW HOME TO BUILD UP FURTHER RUNS

### Fish Transferred Alive in Tanks and pontoons by Dominion's Fish Culture Men in British Columbia in First Experiment of Kind

Bound back home to raise a family last summer, adult sockeye salmon found that there is something new under the sun, after all, when they were taken from the water at the mouth of Adams River in the Shuswap Lake system in British Columbia, put into tanks or specially constructed pontoons and transported seven miles or so to Scotch Creek and there set free to spawn—the first time, so far as is known, when the transfer of any large number of live adult fish has been successfully undertaken.

Some 1,700 fish were handled in this undertaking which was the beginning of an experiment by the Fish Culture Division of the Dominion Department of Fisheries to determine the possibility of building up sockeye runs in new streams by transferring parent fish from accustomed spawning areas to other grounds. The initial steps of the experiment, at least, have been successful for when the fish were set free in Scotch Creek after their travels they straightway headed for the upper reaches of the creek, just as lively, apparently, as when the fish culture men captured them at Adams River.

It is the intention of the department to continue the experiment during a complete life cycle of the sockeye in order to ascertain whether the successive runs of adult fish, each returning to spawn four years after its life began, will ascend Scotch Creek and so build up the stock in that stream or whether they will hie themselves to Adams River, the former spawning area for their family.

#### Another New Venture

Another interesting phase of the work in this district was an experiment in planting "green" eggs on a large scale. From time to time in the past the Fish Culture Division has planted limited

numbers of "green" eggs, with successful results, but large scale operations had not been attempted prior to this year. In these operations over 487,000 eggs were taken from sockeye ready to spawn, fertilized, water hardened, and seeded down in stream beds where conditions seemed to be favourable.

The experiment in connection with the transfer of adult fish from one body of water to another was instituted as a move in the department's effort to grapple with the problem of stocking spawning areas which have become depleted through the construction of dams and other works connected with hydro-electric developments in British Columbia. Projected damming of Adams River for commercial purposes was seen as a possible danger to the stream's value from the fisheries standpoint and the river was chosen as the water upon which the department would focus attention in endeavouring to turn sockeye to new spawning grounds. It was decided to transfer some of the parent fish seeking to enter Adams River, and Scotch Creek, which has had no run of sockeye for some few years past, was chosen to receive the salmon which were transferred.

All told, 1,691 parent sockeye were taken at the mouth of Adams River, which, like Scotch Creek, is tributary to Shuswap Lake. Some of the fish were carried to the creek in specially made pontoons; others were placed in tanks, loaded on to trucks, and carried over land to seed certain favourable reaches of the creek where pontoons could not be satisfactorily used. Immediately upon being liberated the fish made for the upper reaches of the creek to complete, naturally, the process of reproduction, and there is the very interesting fact that in all the remarkable ferrying operation between the river and the creek not a single fish died.

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## LOBSTER CATCHES FOR 1930 SHOW BIG GAIN

### Important Atlantic Coast Fishery Yields Increased Landings but Prices Drop Away

Lobster fishermen on the Atlantic coast have fared well in 1930, so far as size of catch is concerned although not as regards prices, and November operations in Southern New Brunswick waters, the only part of the coast where lobster fishing is permissible in November, hold out promise of continued success.

Taking the period from November 15, 1929, to October 15, 1930—no lobster fishing is permitted anywhere on the coast between October 16 and November 14—the total catch of lobsters was 40,715,300 pounds, or 3,538,100 pounds more than were landed in the corresponding 1928-29 period. As shown by unrevised figures of the Dominion Department of Fisheries, there was also gain in landed value in the 1929-30 period but the gain was not on the same scale as the increase in catch, a condition which was due, of course, to price declines. Landed value for 1929-30 amounted to \$3,661,825, an increase of \$53,790. Revision may slightly change the 1929-30 figures.

Fishing in the waters off Charlotte and St. John Counties, New Brunswick, in the last two weeks of November, 1930, the lobstermen brought ashore over 302,000 pounds, compared with only 288,600 pounds in the corresponding fortnight of 1929. Landed value, however, was considerably lower than a year ago—\$52,500, in round figures, as against \$85,845.

#### Made Record Landings

An interesting and gratifying fact in connection with the 1930 lobster fishery was that the catch by Nova Scotia fishermen in Northumberland Strait waters during what is known as the "fall season"—the lobster season beginning on August 16 and ending on October 15—was the largest they have

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## NOVEMBER SEA FISH LANDINGS INCREASE ON ATLANTIC COAST, DROP ON PACIFIC

### Price Recessions also Operate to Bring About Decrease in Landed Value of Canadian Catches as Compared with Figures For November 1929

Sea fishermen of Canada's Atlantic coast provinces caught nearly 194,000 pounds more fish in November than they brought ashore in the same month of 1929 but the British Columbia catch fell off by over 26,000,000 pounds with the net result that the month's landings of sea fish for the Dominion as a whole were only 57,610,000 pounds as compared with 84,251,600 pounds in November, 1929.

Landed value for November, 1930, showed a decrease of over \$148,000 on the Atlantic coast and a decrease of more than \$335,000 on the Pacific coast, or, all told, \$983,655. Price recessions since November, 1929, as well as the reduction in catch, operated to bring about this condition.

A statement made up from records of the Dominion Department of Fisheries to show the results in November, 1930, and results in November, 1929, is as follows, the 1930 figures being given subject to revision:

		November, 1930	November, 1929
<b>Atlantic Coast—</b>			
Catch. . . . .	Lbs.	21,412,400	21,218,800
Landed Value.		\$482,084	\$630,395
<b>Pacific Coast—</b>			
Catch. . . . .	Lbs.	36,198,300	63,032,800
Landed Value.		\$502,033	\$1,337,377
<b>Atlantic and Pacific Coasts—</b>			
Catch. . . . .	Lbs.	57,610,700	84,251,600
Landed Value.		\$984,117	\$1,967,772

In British Columbia the drop in total landings last month was chiefly due to the fact that the herring catch was little more than half as large as in November, 1929, or 23,312,000 pounds as compared with 45,026,800 pounds. Decrease in landed value was even more marked, or a total value of \$122,772 as against more than \$511,000 in November, 1929.

Salmon catch for the month in British Columbia, 8,863,800 pounds, was also very considerably smaller than in the preceding November when the fishermen landed 14,997,600 pounds. November salmon catch is always made up chiefly of chum salmon and the 1930 runs of this variety of fish have not been as large as in some other seasons. Landed value of the salmon catch for the November just past was \$160,968 as against something more than \$523,000 a year

ago, salmon market conditions being very unsatisfactory.

Operations in the halibut fishery, another of the major fisheries of the Pacific coast, were also less successful than in November, 1929. Catch totalled 1,590,300 pounds and landed value \$164,031 as compared with 1,870,700 pounds and \$243,851. Under the Pacific halibut convention, it may be noted, the halibut season closed on November 14th of each year, both for Canadian and United States fishermen.

#### On the Eastern Coast

Among the Atlantic provinces Prince Edward Island was relatively the most successful in November, so far as fisheries results are concerned. The fishermen of the province showed gains both in total catch and total landed value. Nova Scotia and New Brunswick had larger catches than a year ago, but the landed value totals were smaller in each case. In Quebec, the remaining Atlantic coast province, there was decrease both in catch and landed value. The following table makes comparison between the results of fisheries operations in the several Atlantic provinces in November, 1930, and the results in November, 1929:

		November, 1930	Change as com- pared with November, 1929
<b>Prince Edward Island—</b>			
Catch. . . . .	Lbs.	851,700	+191,600
Landed value. . .		\$28,948	+ \$1,618
<b>Nova Scotia—</b>			
Catch. . . . .	Lbs.	15,924,500	+717,100
Landed value. . .		\$326,152	-\$71,451
<b>New Brunswick—</b>			
Catch. . . . .	Lbs.	3,716,100	+ 93,800
Landed value. . .		\$99,100	-\$58,758
<b>Quebec—</b>			
Catch. . . . .	Lbs.	920,100	-808,900
Landed value. . .		\$27,884	-\$19,720

Nova Scotia's net gain in catch was chiefly due to increased landings both of haddock and mackerel. Haddock catch, 5,114,700 pounds, was greater by more than 500,000 pounds than in November, 1929. Mackerel landings amounted in all to 509,500 pounds as against only 366,400 pounds a year ago. Landings of hake and cusk, 1,504,400 pounds, showed an increase of a little

(Continued on page 4)

## SALMON CATCH MOUNTS IN ATLANTIC WATERS

### Substantial Increase over Landings of Other Seasons during Year Just Ended

While British Columbia fishermen were greatly increasing their catch of salmon in 1930, the same sort of thing was happening in the salmon fishery of the Atlantic coast—a coincidence that is interesting in view of the fact that Atlantic salmon and Pacific salmon are of altogether different species, the former being *Salmo salar* and the latter *Oncorhynchus*.

In the Sea Fisheries on the Atlantic coast in 1930 the commercial fishermen landed almost 6,348,000 pounds of salmon, a total much above the annual average for a good many years past, at least. As compared with landings in 1929 there was an increase of nearly ninety per cent in 1930, but it is to be remembered that the 1929 catch was somewhat below the figures for some other recent years. It is also to be kept in mind, of course, that in these calculations the catches made by anglers are not taken into the reckoning but only the results of commercial operations.

There were increased salmon landings in the Sea Fisheries of all four of the Atlantic coast provinces in 1930. In New Brunswick, the largest producer, and in Quebec and Nova Scotia the total catches were almost twice as large as in 1929. There was a greater relative increase in Prince Edward Island but the catch for that province is never large. The following statement shows the catch, by provinces, for 1930 and the catch in 1929, the 1930 statistics being given subject to revision:

	1930 Lbs.	1929 Lbs.
New Brunswick. . . . .	3,332,300	1,767,200
Quebec. . . . .	1,620,400	818,400
Nova Scotia. . . . .	1,384,600	757,600
Prince Edward Island	10,600	2,700

The total landed value of the 1930 catch to the fishermen was \$855,390 as compared with \$510,935 in 1929. By provinces, the landed value in 1930 was as follows: New Brunswick, \$479,691; Nova Scotia, \$192,177; Quebec, \$181,402; Prince Edward Island, \$2,120.

Virtually all of the Atlantic coast catch of salmon is marketed in the fresh form. A few thousand pounds are used in canning and smoking operations, but Atlantic coast production of canned and smoked salmon is very small.

## OCEAN WATER MOVEMENT GIVES GUIDE TO WHEREABOUTS OF WANDERING COD

### Study of Northward Flow of Warm Waters from Africa Explains Migration of Cod off North America in Certain Years French Scientist Tells International Committee

Success in determining the movement of warm waters from off the coast of Africa northward along the shores of North America to Greenland, and the effect of this movement upon the migrations of cod, was reported by Dr. Edouard LeDanois, Scientific Director of the Marine Fisheries of France, at the 1930 meeting of the North American Committee on Fishery Investigations at Washington, D.C., in November.

Dr. LeDanois said that as a result of success in determining the movement, or "transgressions," of the waters he had been able to advise French fishermen that they would find the most prolific cod fishing last year off the coast of Greenland.

Summed up, very briefly, Dr. LeDanois' statement was as follows: Warm waters push northward in the Atlantic every summer, with a contrary movement in the winter. This northward flow is most pronounced at 18-year intervals, and fluctuates fairly definitely in intervening years. Fish off the northeastern coast of North America are affected by the changes in the water temperature and when the warm flow northward is pronounced their migration toward the cooler waters off Greenland is increased. It was because of the knowledge his investigations had given him as to the probable water conditions last year that Dr. LeDanois was able to advise the fishermen of his country that Greenland areas would offer them the best cod fishing.

Dr. LeDanois attended the Washington meeting as the representative of France. All three of the other countries which are members of the North American Committee were also represented. W. A. Found, Deputy Minister of Fisheries, Dr. J. P. McMurrich, Chairman of the Biological Board of Canada, and Dr. A. G. Huntsman, Senior Director of the Board, were present as Canada's representatives. Henry O'Malley, Commissioner of Fisheries, Dr. H. B. Bigelow, and Elmer Higgins, Chief of the Division of Scientific Inquiry of the United States Bureau of Fisheries, represented the United States, and Hon. H. B. C. Lake, Minister of

Marine and Fisheries, and Dr. Harold Thompson were present from Newfoundland. Several members of the Canadian, Newfoundland, and United States fisheries staffs were also in attendance.

Various fisheries research problems now under investigation were taken up during the two-day sitting of the committee and plans were made looking to continued and more effective co-ordination of fisheries investigations of common interest to the four countries which are members of the committee. A resolution passed by the committee approved of a further study of the Passamaquoddy Bay situation where power development in fishing waters has been proposed. It was felt that apart from the question as to the probable effect which power development operations might have upon the fisheries of the Passamaquoddy Bay region a further examination of the waters from the fisheries standpoint generally would be desirable.

### LOBSTER CATCHES FOR 1930

—*Conc.*

made in this area since the season was established in 1919. New Brunswick and Prince Edward Island fishermen also operate in these waters, and they, too, did well in the 1930 season.

The Nova Scotia fishermen operating during this season landed over 530,000 pounds of lobsters. Their season's catch had never before reached the half million mark, and only twice had it gone beyond 400,000 pounds—in 1922, when 432,900 pounds were landed, and in 1929, when the catch was 435,300 pounds. Their average catch for the season in the 1919-1929 period was only 205,373 pounds, considerably less than half the 1930 total. Reports of the Department, reviewing the 1930 season, point out that "2,024 cases were packed as compared with 1,526 cases in 1929; and 126,800 pounds were shipped in shell as compared with 130,100 pounds. The decrease in shell shipments is due to low prices on the American market rather than to scarcity of large lobsters."

### ADULT SOCKEYE MOVED BY HUNDREDS—*Conc.*

An important feature of the experiment was the demonstration of mobility in fish culture. Hitherto the greater part of fish propagation has been carried on in places near to established fish hatcheries. In this case, however, the work was done entirely in the field, with no hatchery close at hand. Everything was done in the field, including the collection and planting of the "green" eggs that were handled. There was no hatchery for storing eggs until they could conveniently be distributed in nearby streams.

### *Doing the Fishes' Bed-Making*

In this connection the similarity between agriculture and aquaculture was strikingly demonstrated. The layman may not know it but, just as ground is ploughed and prepared for the reception of flower or vegetable seeds, the beds of creeks or shallow streams can be ploughed and harrowed by the fish culture workers in order to prepare suitable spawning grounds, and, indeed, action of this kind is specially necessary where a run has been on the decline for years.

It is the habit of sockeye salmon to prepare a place for spawning by stirring up the gravel on the stream bed with its fins and tail and allowing the current to clean out sand and silt so that the eggs of the female fish may be deposited under the most favourable conditions. Where this has been done in the same places year after year, Nature herself has taken care of the condition of the spawning beds but where a run has gradually declined, or where a new run is to be built up, it is necessary for fish cultural officers to lend a hand. Where there are spots of hard-packed sand and silt, which it would be impossible for a fish to remove, the officers dig them over and the action of the water then bears away the silt and sand, leaving a good natural spawning ground. Usually this digging is done with spades but occasionally the horse-drawn plough and harrow have been used, in shallow streams, with gratifying results.

Smelts are little fish but the Canadian catch of 1929 was worth nearly \$1,125,000. Three-quarters of the world's smelt production is from Canadian waters.

Vitamine D., which is especially necessary in the diet of children, is present in much larger quantity in fish than in other foods.

## ATLANTIC SALMON EGG COLLECTION, RECORD

### New High Mark also Reached by Dominion Department in Rainbow Collection

Record collections of Atlantic salmon eggs and Rainbow trout eggs have been features of the 1930 operations of the Fish Culture Division of the Dominion Department of Fisheries.

The grand total of fish eggs collected by the division during the year for use in increasing the supply of fish in various waters, and stocking new areas, has been somewhat smaller than in 1929 but this condition has been chiefly due to the transfer of Prairie Province hatcheries from Dominion to provincial control. In 1929 the division's collection of whitefish and pickerel eggs, for instance, totalled more than 750,000,000 but the transfer of Prairie Province hatcheries in the course of the past year has meant that a large part of the 1930 collection of these varieties of eggs is not shown in Dominion records but in the hatchery returns of provincial departments.

In the case of most fish, apart from pickerel and whitefish, the Fish Culture Division's collection of eggs in 1930 has increased. In addition to record making collections of Atlantic salmon and Rainbow eggs, there have been large increases in several other cases. Over 1,400,000 Spring salmon eggs, for example, have been obtained, or more than three times as many as in 1929. More than 1,400,000 Kennerly's salmon eggs were collected as against 497,000 a year ago. Collection of Sockeye salmon eggs, slightly more than 97,000,000, showed an increase of nearly 10,000,000. There were also larger collections of eggs in the case of Speckled trout, Landlocked salmon, Kamloops trout, Brown trout, etc. The number of Coho salmon eggs obtained has been much smaller than in 1929, and there have been two or three other decreases.

Canadian fish products are equal to the best. There's no reason for a Canadian buying imported fish.

Fishing for smelt in Northumberland County waters in the latter part of November, New Brunswick fishermen found "a great many very small bass" in their nets, according to a report made to the Dominion Department of Fisheries by the local inspector.

## MINISTER AND DEPUTY VISIT PACIFIC COAST

In the British Columbia fishing world November was marked by the visit of Hon. E. N. Rhodes, M.P., Minister of Fisheries for the Dominion, and the Deputy Minister, W. A. Found. Hon. Mr. Rhodes returned to Ottawa toward the close of the month, and the Deputy Minister shortly before the middle of December. While in British Columbia the Minister announced that he intends to spend a considerable time in the province next summer so that he may acquaint himself fully with the work and problems of the fishing industry on the western coast.

At Vancouver Hon. Mr. Rhodes was the guest of honour and chief speaker at a luncheon given by the Canadian Club of the city and he was also a guest of honour at a banquet held by the Canned Salmon Section of the Canadian Manufacturers' Association. He attended a meeting of men of the industry in Vancouver, and during his time in the province he heard a number of representations in connection with the fisheries and the fishing industry.

While on the coast Mr. Found attended meetings of fishermen in Vancouver, New Westminster, Prince Rupert, and Nanaimo, besides holding conferences with representatives of the canners and other fishery interests. In his capacity of a member of the International Fisheries Commission he made a brief trip to Seattle, Washington, in connection with the operations of the commission, which is charged with the work of carrying on Pacific halibut investigations.

### NOVEMBER SEA FISH—*Conc.*

more than 100,000 pounds, and smelt landings also were somewhat larger than in November, 1929. On the other hand, the catches of such fish as cod, herring, and pollock decreased.

In New Brunswick there were gains in smelt landings while herring catch, 1,221,000 pounds, was more than three times the size of the catch in the previous November. Sardine catch, however, was less than half as large as in the '29 month, or 2,437 barrels as compared with 5,115 barrels.

Prince Edward Island operations for the month were featured by a large increase in oyster landings which totalled 2,206 barrels as against 712 in the preceding November.

In Quebec there were decreases practically all'round.

## FISHES WANDER, OUTPUT OF DRIED FISH FALLS

### Unsettled Conditions in Export Markets also Affect Atlantic Coast Operations

Atlantic coast landings of such fish as cod during 1930 have been smaller than a year ago, with the natural result that the production of dried fish has dropped considerably below the 1929 figures, while, at the same time, unfavourable conditions in various export markets and increasing competition from one or two foreign countries have added to the difficulties of the men in the dried fish industry, which is an important division of fisheries operations in the eastern coast provinces.

There is no accounting for the vagaries of fish, or, rather, Science has not yet succeeded fully in accounting for them, and it has happened that in 1930 the Atlantic fishermen have not struck cod, haddock, etc., in such abundance as in some other seasons. Just where the fish wandered is their secret. In 1931 the fishermen of the Maritime Provinces and Quebec may find them in greater numbers than ever. As for the 1930 market situation, not only have countries which are large buyers of Canadian dried fish been affected by the unfavourable economic conditions which have been so widespread but in one or two cases they have experienced internal disturbances which have dislocated business within their borders.

So far as Canadian output of dried fish is concerned, unrevised figures of the Dominion Department of Fisheries show a production in the Maritime Provinces and Quebec—the only provinces putting up dried fish—totaling something more than 33,953,000 pounds in the first eleven months of 1930, as compared with over 48,000,000 pounds in the like period of 1929. The output of dried cod, the commodity which makes up by far the greater part of the annual production of dried fish, was about 28,747,000 pounds, a drop of some 11,000,000 pounds. There was also smaller output of dried haddock, dried hake and cusk, and dried pollock.

Canada's catch of perch has an annual marketed value of over \$600,000 a year. In 1929, for example, the catch of perch totalled 6,705,000 pounds and the marketed value was \$616,722, which, after all, is quite a tidy sum.

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## FISH CULTURE ADDS TO FISHERIES RESOURCES OF MARITIME PROVINCES

### Brown Trout More than Seven Pounds taken in Waters Formerly Barren of this Species and Stocks of Salmon and Other Fish also Increased

Capture of Brown trout weighing as much as seven and a quarter pounds in Loch Lomond, N.B., last summer is one of the evidences of the value of work carried on by the Fish Culture Division of the Dominion Department of Fisheries to introduce new varieties of fish into Canadian waters and to build up the stocks of native fish.

Brown trout are not indigenous to North America but a few years ago the Fish Culture Division introduced them into some Dominion waters and what has happened at Loch Lomond is a proof of what work of this kind can accomplish. Further evidence of the value of fish cultural effort was observable in the Maritime Provinces last year in such facts as these which have been reported to the Department of Fisheries by James Catt, District Supervisor of Fish Culture:—

There was satisfactory improvement in the stock of small-mouthed black bass in Cocabec Lake, N.B., where these fish—native of Canada but not to Cocabec—were introduced by the Fish Culture Division several years ago; in Pisquid Lake, P.E.I., the July catch of Rainbow trout, a fine gamey fish introduced into this water from Western Canada four or five years ago, exceeded the number of fish taken in the entire season in any previous year; and a very greatly increased bag of *Salmo sebago* (landlocked salmon) was made in Chamcook Lake, N.B., where the Division has been working to build up the former stock of these fish.

Similar evidences of the fruitfulness of intelligent fish cultural work has been observable in other parts of the Dominion.

#### Activities in 1930

During the summer of 1930 high temperatures and drought in different parts of the Maritime Provinces tended to make for losses of fry and fingerlings

in the hatchery operations of the Fish Culture Division in this section of the Dominion but, on the whole, "the season's distribution was most satisfactory." All told, there was a distribution totalling more than 28,000,000 fry, fingerlings, etc., from the Maritime Province hatcheries. Atlantic salmon and Speckled trout distributions made up by far the greater part of the total.

The year's collections were confined to the trout stocks at the several hatcheries carrying brood fish and to three varieties of wild fish—*Salmo salar*, or Atlantic salmon, *Salmo sebago*, or Landlocked salmon, and *Salvelinus fontinalis*, or Speckled brook trout. The usual collection of Atlantic salmon was increased, partly as a result of the use of new and improved equipment at Morell River, P.E.I. Improvement in fish culture equipment during the year included the construction or installation of a large trap, pounds, and a spawning shed at the mouth of Morell River, new fingerling ponds at the hatchery at Bedford, N.S., a new deep brood pond for trout at the hatchery at Florenceville, N.B., and additional batteries of hatching troughs at Antigonish, N.S.

An interesting feature of the year's program was the continuation of the work in selective breeding of trout. Promising progress was made in this connection. Investigations carried on included experiments as to the nutritional value of various feeding mixtures for fry and as to the percentage of free oxygen exhausted from water by salmon fingerlings. Another interesting bit of work was an effort to perfect a new form of oxygen tank for use in transporting fish. Further work was done during the year toward determining what waters in Nova Scotia are

(Continued on page 2)

## FISH ABUNDANT IN VITAMINS, IODINE

### Richer than Many Other Foods in Elements Essential to Health

Scientists find out many interesting things and one important discovery which research has made in recent years is that fish contain elements which not only build strength but guard health, and contain them in larger amounts than most other foods.

For instance, Vitamin D. is abundant in fish but it is lacking in many other foodstuffs. Vitamin D., important in the diet for everybody, is especially important in the diet for growing children because of its part in bone development and the prevention of bone defects. "The condition which results from starvation for this vitamin," says a noted North American physician and research worker, "is generally designated as Rickets. It is not confined to the bones but affects all tissues of the body. . . . Bone defects," he adds, "are rare among children where fish forms a prominent article of diet" and "Vitamin D. is contained in very small amounts in any foods thus far studied, except in the oils of fishes."

Then, too, in addition to containing Vitamin A. and Vitamin D., fish are unusually high in iodine content, especially sea fish, while "most common foods contain very little iodine." The importance of this fact from the health and dietary standpoint, of course, is that study has determined that iodine is a preventive of such diseases as goitre, or, in the words of a prominent scientist, "foods containing iodine have been of great help in preventing and controlling goitre" and "the prevalence of goitre is, roughly, inversely proportional to the iodine content of food and drinking water." Surveys have shown that goitre is less prevalent in coastal regions, where fish foods are frequently on the table, than in areas where there is small consumption of fish.

Vitamins A. and D., iodine, calcium, which is necessary to the growth and

(Continued on page 2)

## 1930 SEA-FISH LANDINGS DROP BUT TOTAL MORE THAN BILLION POUNDS

### Records in British Columbia Salmon Fishery Feature of Past Year in Sea Fisheries—Total Landings for Dominion Smaller than in 1929

Canada's catch of sea fish in 1930 totalled 1,002,022,200 pounds and its landed value to the fishermen amounted to a little more than \$23,621,000, according to unrevised statistics prepared by the Dominion Department of Fisheries.

Both in catch and landed value, however, the totals are below those for 1929. Notwithstanding that the salmon landings reached record size, and that there were increased catches of such fish as lobsters and swordfish, the aggregate catch of all varieties was less by some 22,000,000 pounds than in the preceding year. Landed value total was affected not only by the drop in catch but by price declines and showed a decrease of approximately \$3,599,000 from the 1929 figures.

On the Pacific coast a record catch of salmon had the effect of more than offsetting decreases in the landings of other varieties of fish so that the total British Columbia catch of sea fish was more than 13,000,000 pounds greater than in 1929, or 538,585,000 pounds, in round figures, as compared with 525,867,900 pounds. Landed value, however, dropped from \$14,070,230 in 1929 to \$12,160,000 in 1930.

The productiveness of the British Columbia salmon fishery was the outstanding feature of the 1930 operations. A catch of approximately 216,500,000 pounds broke all records, and, similarly, a new record in canned salmon output was made when about 2,220,000 cases were packed. The catch record previously existing was 212,555,500 pounds and the pack record 2,065,198 cases, both records having been made in 1926. The catch in 1930 was some 65,000,000 pounds larger than in 1929 and the pack of canned salmon exceeded the figures for the preceding year by something like 820,000 cases.

#### *In Eastern Waters*

Prince Edward Island alone, among the Atlantic provinces, showed increased landings in 1930 and, taking the coast as a whole, the total catch, 463,437,000 pounds, was less by about 40,000,000 pounds than in 1929. In the case of each of the four provinces the 1930 landed value fell below the 1929 figures.

Increased lobster production was a feature of the year's Atlantic operations. In many localities the lobster fishery was more successful, so far as size of catch was concerned, than it had been for years, and the total catch for the past was 41,073,700 pounds as against 37,282,000 pounds in 1929. Large increases in salmon and swordfish landings and a substantial gain in mackerel takings were also recorded.

Total Atlantic coast catch and landed value for 1930, by provinces, were as follows:

	Catch Lbs.	Landed Value \$
Nova Scotia.. . . . .	257,624,200	6,838,093
New Brunswick.. . . .	120,410,100	2,504,378
Prince Edward Island.	25,425,700	785,405
Quebec.. . . . .	59,977,000	1,334,059
	463,437,000	11,461,935

### FISH CULTURE ADDS TO RESOURCES

*(Continued from page 1)*

suitable for the introduction of Rainbow trout, and examinations looking to an improvement in the salmon runs were made on the Mersey River, N.S., and at East River, Sheet Harbour, N.S. Incidentally, it may be noted that the 1930 commercial catch of Atlantic salmon was exceptionally large and the abundance of salmon is believed to have been due, in considerable measure, to the salmon cultural work carried on by the Department in Atlantic coast areas in recent years.

#### *Aided Sportsmen*

In the course of the year trout stock was supplied for rearing ponds which were established by the Fish and Game Association of Cape Breton County, N.S. Officers of the Fish Culture Division also assisted the association by giving advice requested of them as to the most efficient methods of operating ponds of this kind.

In New Brunswick there was co-operation with the provincial authorities in carrying on investigations to ascertain suitable sites for wayside angling ponds, which would bring angling within easy reach for visitors to the province as well as for resident citizens.

## TONS OF DRY SALTED HERRING FOR ORIENT

Production of dry salted herring in British Columbia in the 1930-31 season—October to February—will apparently not be as large as in the preceding season but, none the less, there will be many thousands of tons for export to the Orient, the market for this Canadian fish product.

At the end of December, 1930, the pack was approximately 30,300 tons, as reported to the Dominion Department of Fisheries by its Chief Supervisor for British Columbia, Major J. A. Motherwell, while at the corresponding time in 1929 the output was slightly more than 38,000 tons. Smaller catches of herring and less favourable market conditions in the current season explain the decrease.

The greater part of the production of dry salted herring is on the east coast of Vancouver Island; for instance, about four-fifths of the pack prepared up to the end of last December was credited to the east coast. The method of packing is simple. The fish are placed in big bins, together with large quantities of salt, and are allowed to remain there for several days. Then they are removed, drained, and packed in boxes for shipment, more salt being added while the boxes are being filled. Virtually the entire pack of each season goes to China, though some of the shipments go by way of Japan, and in the calendar year 1929 the export was valued at almost \$1,950,000. The shipments are covered by inspection certificates issued by pickled fish inspectors on the staff of the Dominion Department of Fisheries.

### FISH ABUNDANT IN VITAMINS

*(Continued from page 1)*

strength of teeth and bones—these are among the elements which make fish foods so valuable to the human body. In many other foods these elements are lacking or, as has been said, they are present in much smaller amounts than in fish. Canadian fish foods are available all the year round, moreover, fresh or frozen or smoked or dried or pickled or canned, and since there are so many different varieties of fish and shellfish taken in Canadian waters, and fish foods may be prepared for the table in so many different tasty ways, they may be used frequently without monotony in the family menu.

## NOW CARRY CANADIAN FISH BY AIRPLANE

Whitefish, Trout, Fly toward Market from Northern Saskatchewan Waters

Seaplanes have been used to much advantage by the Dominion Department of Fisheries in patrol work in British Columbia for several years past and now the airplane is being used with apparent success in transporting Saskatchewan fish from remote waters to railway shipping point.

Twice daily in recent weeks a plane operated by a western company has been carrying 1,600 pounds of whitefish and trout from Lac la Ronge to Prince Albert, a distance of upwards of 200 miles, for shipment by rail to Chicago and New York. Results so far are reported satisfactory.

The fish are carried from Lac la Ronge in an unfrozen condition and immediately on reaching Prince Albert they are iced and packed for shipment in 50-pound boxes.

While airplane transportation has been reported satisfactory, it was found that increasing demand for the northern fish made necessary an additional means of carriage so two motor tractors, each hauling a heated caboose, were brought into service. Each caboose has a carrying capacity of about 7,000 pounds of unfrozen fish and a trip from the lake by the two tractors means approximately sufficient fish brought to Prince Albert to make up a carload lot for shipment.

Though this is the first year in which fish have been handled by plane, catches from waters in the more remote areas of northern Saskatchewan and Alberta have been successfully marketed as far away as the cities of the United States for several seasons past. Fish from Lake Athabasca, for instance, have won market favour, notwithstanding that the distance they have to be carried from the lake to the international boundary alone is some 700 miles.

Reports to the Dominion Department of Fisheries from its officers in British Columbia are to the effect that satisfactory seeding of the salmon spawning grounds has apparently taken place this year. Future runs of salmon depend, of course, upon adequate seeding of spawning areas.

## THOMPSON SOCKEYE RUN BEST FOR 20 YEARS

British Columbia officers of the Dominion Department of Fisheries, reporting to the Chief Supervisor at Vancouver, describe the 1930 run of sockeye salmon to the Thompson River system as having been probably the largest in twenty years. Sockeye are predominantly a 4-year fish, as regards length of life cycle, and the officers report that the 1930 run to the Thompson system has been much larger than the run in 1926.

Reports of the British Columbia officers are that, generally, the seeding of the salmon spawning grounds throughout the province during 1930 has been satisfactory. It is upon the seeding of the spawning areas each year, of course, that the size of the salmon runs in future years largely depends, and it is for this reason that the department is strict in enforcing measures calculated to ensure adequate escapement of the mature fish to the spawning beds as they come in from sea during the fishing season.

## NETS BY HUNDREDS LOST AS ICE SHIFTS

What the moods of the Storm King may mean to the commercial fisherman is illustrated by the recent experience of smelt fishermen in Northumberland County, N.B., the most important smelt fishing area in the Dominion, where hundreds of nets were carried away when a long stretch of ice shifted in a gale and was borne seaward. Most of the nets would be beyond recovery, Inspector Theodore Bell reported to the Dominion Department of Fisheries, so that the storm meant a loss of a great many thousands of dollars to the fishermen. Smelt fishing is done through holes in the ice and when the winds broke off some fifteen miles of ice near the mouth of the Miramichi River all the smelt gear that was on it was carried out to sea. Against hazards of this kind the fisherman can have no insurance and a few spells of bad weather may cut disastrously his season's returns from any fishery.

British Columbia Indians reported in November that chum salmon were present in the Nimpkish River in larger numbers than they had seen for many years.

## P.E.I. SALMON CAUGHT IN BELLEISLE STRAIT

Tagging Brings out Interesting Facts in Study of Fish Migrations

Tagged by the Fish Culture Division of the Dominion Department of Fisheries at the end of November, 1929, a salmon from the Morell River, P.E.I., went a'wandering and when it was caught last June its captor was a Newfoundland fisherman who was operating north of Red Bay in the Strait of Belleisle. What attraction lured the fish to the strait is not certain—possibly there is some rich feeding ground in the strait waters to which the salmon was guided by instinct—but its capture added another paragraph to the story of fish migrations which is gradually being compiled by means of tagging operations. Whenever a salmon is tagged and liberated a record is made by the Fish Culture Division of the number of the tag, place of liberation, sex, size, and weight of the fish. When a tagged fish is caught and the tag is returned to the Department of Fisheries the record is completed by adding to the data already on file the place of capture and, whenever possible, full particulars as to the size and weight of the fish when retaken. In the course of time, as tagging is continued, it may become possible to reach definite conclusions as to the course which different varieties of fish follow in their migrations. Information of that kind, of course, would be of great value to the fishing industry. In addition to salmon tagging done by the Fish Culture Division, fish tagging is also carried on by the Biological Board of Canada both in Atlantic and Pacific waters.

Numbers of fish, tagged by Canadian fisheries experts in the effort to assemble data as to migration courses, have been recaptured comparatively close to the places in which they have been liberated after tagging. In other instances, however, it has been found that the fish had travelled considerable distances before recapture and had arrived in altogether different localities from those in which they had been set free. For instance, a salmon tagged by the Fish Culture Division off Port Maitland, N.S., early in June, 1925, was caught a month later in the Moisie River, Quebec. That fellow had travelled both far and fast. Another salmon, tagged at Tadoussac, P.Q.,

(Continued on page 4)

## DECEMBER SEA FISH LANDINGS SHOW GAIN ON BOTH COASTS OF DOMINION

### Landed Value Falls Off with Less Price Levels Despite Increases in Catches by Fishermen in Atlantic and Pacific Waters

Canadian fishermen made a larger total catch of sea fish last December than in December, 1929, but prices were at a less favourable level and the landed value of the catch showed a decrease.

Both on the Pacific coast and the Atlantic coast there were increased landings, with the total catch of 53,012,000 pounds representing a gain of some 5,750,000 pounds. Pacific coast catch was approximately 37,131,000 pounds, up 4,521,000 pounds as compared with December, 1929, and the Atlantic landings were 15,881,000, a gain of something over 1,231,000 pounds. British Columbia landed value for the month was \$282,065, a decrease of \$102,400, and on the Atlantic coast the value total was \$421,900, or nearly \$136,600 less than in the previous December. All the figures are as compiled by the Dominion Department of Fisheries but those for the 1930 month are subject to revision.

#### Atlantic Results

On the eastern coast the Nova Scotia, Prince Edward Island, and Quebec fishermen made larger landings than in the preceding December while the New Brunswick catch fell off. Prince Edward Island operations resulted in a gain in landed value, but in each of the other three provinces there was a decrease.

The Prince Edward Island catch, never very large in December, was approximately 460,000 pounds, or a gain of 152,000 pounds. Landed value amounted to a little more than \$24,400, a betterment of between four and five thousand dollars. The major operations in Prince Edward Island in December are in the smelt fishery and in the month just past the catch amounted nearly to 395,000 pounds.

Nova Scotia fishermen brought ashore about 12,112,000 pounds of fish during the month, and the catch had a landed value of \$255,445. Catch showed an increase of about 1,600,000 pounds but on the value side there was a drop of more than \$74,000. There were increased landings of such fish as cod, hake and cusk, pollock, smelts, lobsters, and mackerel.

In Quebec there was a substantial gain in herring landings—a catch of

nearly 303,000 pounds as against less than 160,000 pounds in December, 1929—but much smaller landings of smelt were reported than in the earlier month. It was this decrease in smelt landings which brought sharp drop in total landed value, which was only \$1,900 as compared with almost \$6,300.

New Brunswick showed gain in smelt landings, though landed value declined, but most of the other fisheries were less successful than in December of the previous year. All told, the New Brunswick catch was 2,972,000 pounds as against 3,624,500 pounds in December, 1929, and total landed value was \$140,195 as compared with \$202,773.

#### In British Columbia

Right up to the end of 1930 the salmon fishery in British Columbia continued to be more productive than in previous years. December salmon catch and landed value were considerably greater than in December, 1929.

The herring fishermen also did considerably better than in the preceding December, so far as size of catch was concerned; but their return in landed value was only \$174,850 a decrease of over \$128,000. Total herring landings for the month were 33,955,000 pounds, a gain of nearly 2,900,000 pounds. Clam landings also showed substantial increase, 4,155 barrels as against 2,873—and in this case bigger catch also meant bigger landed value, or \$12,520 as compared with a little more than \$8,900.

#### P.E.I. SALMON CAUGHT IN BELLEISLE STRAIT

(Continued from page 3)

ended its career in Henley harbour on the Labrador coast. Several tagged in the Miramichi and Kedgewick rivers, N.B., were caught off Newfoundland, and that is true, too, of a number of fish tagged in the Margaree River, Cape Breton Island. Other salmon tagged in the Margaree, which empties into the ocean on the western side of Cape Breton, were taken on the eastern side, having evidently shaped their migration route around the northern tip of the Island.

## FEWER PILCHARDS BUT MORE PILCHARD OIL

### British Columbia Output Increases Despite Smaller Catch and Fewer Plants

British Columbia fishermen landed fewer pilchards in 1930 than they caught in 1929, and fewer reduction plants using pilchards as raw materials were in operation in the province, but, nevertheless, the production of pilchard oil has been larger than a year ago, although not up to the high level of 1928.

The pilchard runs were rather later than usual in setting in this year but when they came the fish were generally oilier than in 1929, and this fact explains how it was that oil production reached 2,928,145 gallons as compared with 2,856,676 gallons in the earlier year. Seventeen reduction plants using pilchards were in operation, or seven less than in 1929. Most of Canada's output of pilchard oil, which is manufactured in British Columbia only since pilchards do not occur in the Dominion's Atlantic or inland waters, is sold in the export market. It is used in making fats for cooking purposes and, to some extent, in the manufacture of soaps, etc.

While the year's output of pilchard oil has been larger than a year ago there has been a decrease in the production of pilchard meal, or 13,841 tons as against 15,826 tons in 1929. Together with the fact that prices have not been favourable, this decrease will tend to keep down the total marketed value of the year's pilchard catch.

Fisheries patrol work is not all sunshine and smooth going, as witness an experience of W. H. Bannister, an Alberta fisheries officer. Traversing the north shore of Lesser Slave Lake last November Mr. Bannister had to make his way around innumerable windfalls, cross partially frozen muskegs which frequently gave away, surmount shale ice piled ten feet high—and by nighttime he was only six miles farther ahead than he had been in the morning when he began the day's travel.

Transportation of live fish by rail is possible by means of a tank system which has been patented by a European inventor. Sea water is kept in circulation in the tanks by means of an independent pumping system which forces it through filters.

# FISHERIES NEWS BULLETIN

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Deputy Minister:  
W. A. FOUND

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## PLAN TO CHANGE MIGRATION ROUTE OF SALMON INEFFECTIVE SCIENTIST FINDS

### Dominion Fisheries Investigator Reports Closing of Southerly Outlet of Fraser would not Appreciably Affect Course of Fish toward British Columbia Spawning Grounds

After several years' investigation under the auspices of the Biological Board of Canada, Dr. A. H. Hutchinson, of the University of British Columbia, has reported negatively upon the suggestion that closing Canoe Pass, the most southerly outlet of the Fraser river, would so divert the influence of the river that salmon bound for the spawning grounds in the Fraser system would be led to take a course through Canadian waters near Vancouver Island instead of through United States waters.

To change the present travel route of the salmon would mean that many more of the fish would escape the traps operated by United States fishermen off Point Roberts and other places just south of the international boundary line, and it was this end which those suggesting the closing of Canoe Pass had in mind.

As it is now, a great many of the salmon making for the Fraser move from the Pacific by way of the Strait of Juan de Fuca and thence into United States waters where many traps are operated. The theory put forward by those who suggested that Canoe Pass be closed was that the outflow from the Fraser had effect over a wide stretch of coast waters in lowering salinity and if this influence could be projected farther across the Strait of Georgia toward Vancouver Island the sockeye and other salmon would change their migration course in such a way that the United States traps would not take their great toll of fish whose natural spawning ground is in a Canadian watershed.

Dr. Hutchinson's finding, after an investigation which has been in progress since 1926, is that the facts do not uphold this theory. The investigation included the analysis of more than 4,000

water samples and 2,000 determinations of plankton for fish food.

#### *What Was Found*

In his summarized report Dr. Hutchinson points out that the migration of salmon to rivers may be directed by responses to changes in salinity or temperature or some other characteristic which distinguishes brackish water from sea water, "by the presence of food in the form of herring, etc., which, in turn, feed upon plankton," by water currents, or by a characteristic "which, for convenience, we may term instinct". So far as the effect of the Fraser outflow in producing lowered salinity in the Strait of Georgia is concerned, Dr. Hutchinson found that, southward, the influence of the river extends for approximately fifteen miles only, although, northward, it is apparent for more than 100 miles. He also found that the region of lowered salinity extends from the mouth of the Fraser "directly across the Strait of Georgia to the vicinity of Vancouver Island", covering an area with a width of some seven miles and reaching downward to a depth of thirty feet. This region of low salinity is marked by relatively high temperature; "the difference in surface temperature, as compared with that in Juan de Fuca, may be as much as 10 deg. C. or 18 deg. F." As to plankton supply, the investigation showed that the regions where the Fraser outflow mixes with the sea water are "the centres of the richest plankton or microscopic food areas" so that it is not any deficiency in this regard in Canadian waters that impels the salmon to follow their present migration course. So far as causation of currents is concerned, Dr. Hutchinson's report says that tides and winds are the factors of primary importance and the effect of the flow

(Continued on page 2)

## INLAND WATERS YIELD 20 VARIETIES OF FISH

### More than Half World's Fresh Water in Interior Areas of Dominion

More than half the fresh water of the globe is contained in inland waters of Canada and twenty different varieties of food fishes are obtained from them in abundance by commercial fishermen each year.

Expansion of operations in the fresh water fisheries of the Dominion has been a feature of Canadian fisheries development in the past few years and the extent of the waters in which inland fishing is carried on commercially, and the number of kinds of fish which inhabit them, warrants confidence that still greater expansion can be accomplished in the future.

Inland commercial fishing is carried on in six provinces and in the Yukon Territory, but the operations in the Yukon and in New Brunswick are not on a large scale and the major production is in Quebec, Ontario and the Prairie Provinces. The inland fisheries of New Brunswick—a province which has very important sea fisheries—account for a production valued at some \$30,000 a year, while the Yukon output, chiefly salmon, fluctuates considerably, and in 1929 amounted to a little less than \$25,000. Ontario's 1929 production, on the other hand, was valued at \$3,920,000, in round figures, the Manitoba production at more than \$2,745,000, the Alberta output at something over \$733,000, and the Saskatchewan fisheries yielded nearly \$573,000. Quebec's inland catch was worth slightly more than \$564,000, or about a quarter as much as the value of the production from the sea fisheries of the province.

#### *Whitefish Comes First*

Whitefish account for the largest single item in the table of production values for the inland fisheries, or a couple of million dollars and more in the normal year. The largest whitefish output is

(Continued on page 2)

## JANUARY CATCH OF SEA FISH LARGER ON ATLANTIC COAST, SMALLER IN B.C.

### Gains Shown in all Atlantic Provinces save New Brunswick—Herring Decrease Pulled Down Pacific Total—Landed Value for Dominion Dropped

January saw larger landings of sea fish by Canada's Atlantic coast fishermen than were made in January, 1930, but on the Pacific coast there was a sharp decrease, so that, for the Dominion as a whole, the month's harvest from the sea fisheries was only 32,383,000 pounds, in round figures, as against 36,693,100 pounds in January of last year.

There was also a decrease in the landed value of the catch to the fishermen, these value figures totalling only slightly more than \$422,000, or about \$304,000 less than a year ago. Although the Atlantic coast landings showed a gain and British Columbia landings a drop, the decrease in landed value was greater in the east than in the west, or \$159,800 in the one case and \$144,375 in the other. Total landed value on the Atlantic coast, as shown by unrevised statistics prepared by the Dominion Department of Fisheries, was \$271,850, and on the Pacific coast the figures were \$150,500.

#### British Columbia Operations

Smaller landings of herring were chiefly responsible for the decrease in British Columbia's total catch for the month, which amounted to 21,915,000 pounds as against 27,023,000 pounds in January of last year. In the preceding January the herring catch reported was almost 23,995,000 pounds, while in the January just past it was only 19,556,000 pounds. Herring landed value, of course, showed a large decrease and was slightly less than \$100,000 as compared with nearly \$217,000 a year ago.

British Columbia ranks second among the provinces in point of size of annual clam production but January yielded smaller landings than January, 1930, or less than 2,100 barrels as compared with 3,973 barrels.

The salmon fishery was more productive than in the preceding January, but the landings for this month of the year are never important.

#### On the Eastern Coast

The results of the month on the Atlantic coast were, in broad outline, as follows:—

	January, 1931	January, 1930
Nova Scotia—		
Catch . . . . . lbs.	8,145,000	7,009,000
Landed value . . . \$	166,700	198,540
New Brunswick—		
Catch . . . . . lbs.	1,864,000	2,361,000
Landed value . . . \$	83,995	212,755
Prince Edward Island—		
Catch . . . . . lbs.	309,000	275,500
Landed value . . . \$	12,110	17,075
Quebec—		
Catch . . . . . lbs.	151,000	24,000
Landed value . . . \$	9,050	3,285

Smelts were the only fish reported from the Québec sea fisheries in either month, and the figures show that they were found by the fishermen in much greater abundance last month than in the previous January. There were also increased landings of smelts in Nova Scotia and Prince Edward Island but in New Brunswick, the biggest producer, the month's catch was only about 1,133,000 pounds as against 1,373,000 pounds more than that in January, 1930. The smelt fishery is the principal fishery carried on in Prince Edward Island and New Brunswick during January.

Nova Scotia's catch of cod was a little smaller than in the preceding January but haddock landings, 2,768,000 pounds, showed a gain of 350,000 pounds. The noteworthy gain in Nova Scotia catch was in the landings of pollock, which totalled nearly 821,000 pounds, or an increase of considerably more than 100 per cent.

#### PLAN TO CHANGE (Conc.)

of the Fraser is secondary within the Strait of Georgia and is "probably negligible".

It is evident in the light of the data brought out by the investigation, the report concludes, "that closing Canoe Pass would not modify the conditions which may direct the course of the sock-eye movements in sufficient degree to have any appreciable effect on their migration or the possibility of their reaching spawning areas".

Quebec's landings of salmon in the sea fisheries in 1930 were slightly more than 1,600,000 pounds, a gain of 615,000 pounds over the 1929 catch. The Quebec salmon are of prime quality and are in much demand upon the fresh fish markets.

## SPARE TREES TO SAVE ANGLING WATERS

Spare the trees and bushes near to the banks of brooks, and there'll be more fish in the brooks for the country dwellers and the visiting anglers. Cutting down these bushes and trees means more likelihood of low water in the streams in the summer season, or even danger that the brooks will dry up, and that means diminished angling resources. Reporting to the Dominion Department of Fisheries a few weeks ago, one of its supervisors in Nova Scotia, where there was low water in numbers of the streams in some areas last summer and, consequently, poorer angling than usual, pointed out that "cutting down of alder bushes and other small trees by farmers has helped to dry up brooks." Let it be added, to the farmers' credit, that when the supervisor drew the attention of several of them to the injurious effect of action of this kind upon fish life they at once agreed to see to it that tree growth close to brooks on their land would be left alone after this whenever possible. That's a good rule for everybody to follow: Spare the trees and bushes near the brooks, and thus help to maintain the stocks of fish in these waters.

#### INLAND WATERS (Conc.)

in Ontario, with Manitoba, Saskatchewan and Alberta following in order. There is also some whitefish production in Quebec, small catches are made in the Yukon, and a few fish are taken in New Brunswick.

Other fish taken in the inland commercial fisheries are alewives, bass, carp, catfish, dore or blue pickerel, eels, goldeyes, herring, maskinonge, mullets, perch, pickerel, pike, salmon, saugers, shad, smelts, sturgeon, trout, and tulibee. Not all the varieties, of course, are taken in all the areas where the commercial fishermen operate. Alewives, for instance, are taken in New Brunswick only, shad in New Brunswick and Quebec, and smelts in Quebec only, although New Brunswick's sea fisheries are the biggest smelt producers in Canada.

Vitamin A, one of the elements present in fish, has been found by scientists to be an effective factor in maintaining the power of the human tissues to resist infection. So effective does it seem to be that one authority has designed it as the "anti-infective vitamin."

## DOMINION SCIENTISTS FIND NEW WAYS TO HELP DEVELOPMENT OF FISHERIES

### Additional Applications of Rapid-Freezing Process Worked Out at Federal Experimental Station to Help Expansion of Mackerel Canning and Scallop Marketing

How science is helping to further the development of the Canadian fishing industry is indicated by the success of scientific investigators, working under federal auspices, in establishing such facts as these:—

Rapid-frozen mackerel, kept for more than two months before canning, cannot be distinguished from fish that are canned immediately after being caught and the product is comparable to canned salmon.

Rapid-frozen scallops are quite the equal of fresh unfrozen scallops, even after being kept in storage for several months.

Establishment of these facts opens the way to expansion both of the mackerel canning industry and the trade in scallops, a very tasty shellfish which occurs off different parts of the Atlantic coast. The facts have been brought out by extended study and experimentation at the Atlantic Fisheries Experimental Station, Halifax, one of the four stations conducted by the Biological Board of Canada, which operates under the authority of the Minister of Fisheries for the Dominion. It is at this station that the Board has carried on the major part of its experimentation in connection with the "rapid-freezing" process of treating fish, and there is continued research to ascertain additional ways in which the process may be usefully applied in the fishing industry. Many other investigations and experiments, of course, are also carried on at the Board's stations on the two coasts, and established facts are made freely available to the fishermen and fishing companies.

#### *Canning Frozen Mackerel*

Canned mackerel are excellent food, but mackerel are caught at certain periods only and the movements of the schools are uncertain so that comparatively little canning has hitherto been done. It is obvious, as one of the Biological Board bulletins points out, that there would be a great waste of time and energy "in keeping a factory (cannery) in readiness, with the operatives waiting, to handle a school of mackerel whenever it might appear, and it would

never pay to have factories large enough to take care of the largest catch that might be expected in any locality and before it had sufficient time to spoil." The Board therefore attacked the problem as to whether or not mackerel frozen by the rapid-freezing or brine-freezing process would be suitable for canning, since an affirmative decision would mean that at times of abundant catches mackerel could be frozen and placed in storage to ensure a steadied supply of raw material for the canners in future weeks.

The investigation was put in the hands of Ernest Hess, bacteriologist of the Halifax station, and what was found out is shown by this extract from the Board's bulletin: "Both spring and fall mackerel have been frozen (either 'round' or after being cleaned) by immersion in brine at zero fahrenheit for two and a half hours, and then stored at zero or a somewhat lower temperature for two or two and a half months before canning. An examination of the very tasty canned article has revealed no difference, in either appearance or flavour, between those canned immediately after being landed and those that were frozen and stored before canning. Over thirty-five people tried the product (that had been frozen) and declared it to be of excellent quality, comparable to canned salmon. The spring mackerel, though not so fat as the fall mackerel, were found to be quite rich and most suitable for salads."

#### *Helping the Scallop Trade*

In dealing with the case of scallops the Board's investigators were concerned with finding possible means of properly preserving these shellfish, which are found in Atlantic coast waters and must be marketed in the fresh state to be of proper quality. Canning has been attempted, but not successfully as "the strikingly white, firm meat of the fresh scallop turns dark in the can and separates into fibres". The scallops taken in Canadian waters are of an exceptionally fine and large species, but, like all scallops, they are very perishable and, hence the importance of the scientists' efforts to find a satisfactory means of

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## NEW FISHERIES BOATS FOR PACIFIC SERVICE

Four new boats will be added to the fisheries patrol fleet in British Columbia waters this summer by the Dominion Department of Fisheries so that continued efficiency of patrol on all parts of the coast may be ensured.

Each of the boats will be fifty-two feet long and, equipped with Gardiner diesel engines, 72 h.p., will have a speed of ten knots. They will also each be equipped with an oil auxiliary engine. The contract for building the boats has been placed with the Walkem Shipyards, Vancouver, and delivery is to be made during the spring.

One of the boats will go on duty in the Queen Charlotte area, replacing the *Onerka*, which was burned some months ago, and another will take the place of the *Merrysea*, which was sunk in November through a collision with a commercial steamer. The other will replace boats which have been in the service for some time and are no longer wholly satisfactory for work of the kind.

## LANDINGS OF LOBSTERS SHOW SOME DECREASE

Lobster landings in the Maritime Provinces in the period between the middle of last November and the end of January were slightly smaller than in the corresponding period of 1929-30, or approximately 628,100 pounds as compared with 650,800 pounds. In each case the figures represent landings in only those few areas in New Brunswick and Nova Scotia where lobster fishing is permitted in the course of the November-January period.

Decrease in landed value was to be expected since not only was there a smaller catch in the November-January period just past but prices in the lobster trade were low. The value of the catch to the fishermen was something more than \$139,000 as compared with \$208,646 in the previous corresponding period.

Canada sells fish meal in Germany in some quantity but there is room to expand the business greatly. During the first eleven months of 1930 the German imports of meal totalled more than 95,000 metric tons (2,204 pounds to the ton) but of this quantity Canada and the United States, together, supplied only 6,142 tons.

## FOUND CO-OPERATIVE MARKETING SUCCESS

**Nova Scotia Fishermen's Group to Continue  
Move Undertaken Experimentally  
Last Year**

Experimenting last year with co-operative marketing of fresh salmon, members of the fishermen's association at Arisaig, N.S., met with such a measure of success that they are planning even more energetic operations during the coming summer.

A report made to the Dominion Department of Fisheries by Inspector W. G. Harris, whose territory includes the Arisaig area, shows that between mid-June and the beginning of September last year approximately 145,000 pounds of salmon were handled by the association under its co-operative marketing plan, and the average price obtained was about \$13 a hundredweight. During the salmon season the fish were collected by motor truck, which travelled 103 miles daily, covering some ten fishing districts, and were taken to Antigonish town for shipment by railway express. Sales were made in Nova Scotia towns, but there were also shipments to Montreal and Toronto, and some to Boston. In finding markets for their salmon the fishermen were assisted by Inspector Harris on several occasions.

The fishermen were alert to the necessity of seeing that their shipments were of thoroughly good quality and Inspector Harris has reported that buyers were "entirely satisfied with the manner in which the fish were iced and packed, and in every case the fish arrived at their destination in excellent condition."

## FISHERIES VESSEL ON LIFE SAVING PATROL

Life saving patrols are among the multifarious duties performed by vessels of the Dominion Department of Fisheries in Pacific waters and during this winter two spells of service of this kind were carried out on the west coast of Vancouver Island by the "Givenchy", with Captain W. Redford in command. In other years the "Givenchy" has occasionally had strenuous times in assisting vessels which found themselves in distress but this season's patrol has been comparatively uneventful.

## VANCOUVER ISLAND'S HERRING RUNS BIG

**Probably Largest in Ten Years on Northern  
Part of West Coast**

Herring runs on the northern part of the west coast of Vancouver Island were much larger during early weeks of the year than for some ten years past, according to reports made to the Dominion Department of Fisheries by its inspector at Nootka, and reduction plant operations to produce meal and oil were continued night and day.

Utilization of herring in reduction works is not ordinarily permitted in Vancouver Island areas but this year, with a view to assisting in meeting employment needs, the Department allowed it to be carried on and, north of Barclay Sound, the herring fishing season was extended until the end of February.

While the fish were exceptionally abundant, they turned out to be very low in oil content so that the oil production was small as compared with the quantity of herring landed by the fishermen. On the other hand, however, the meal produced was of "very fine quality."

Farther north in the province, up in the Prince Rupert area, there have also been some large catches of herring. One haul made by a purse seine boat, for instance, brought in approximately 125 tons of fish, and some of them had to be freed because it was impossible to handle them. Use of herring for reduction purposes has been permitted in this part of the province for some years.

## DOMINION SCIENTISTS (Cont.)

maintaining the quality of the product while being sent to market.

In this case, too, the experiments were carried on by Mr. Hess. He found canning and sterilization unsatisfactory, and the Board's bulletin reports that "such a process of preservation is not to be recommended." After other experiments Mr. Hess tried rapid-freezing of fresh scallop meat, putting the meat in containers which protected it from contact with the brine. "A very attractive, beautifully white product was the result," says Dr. A. G. Huntsman, Senior Director of the Board, "and this proved on being tested by cooking and eating to be quite the equal of fresh unfrozen scallops, even after it has been kept several months in storage."

## OXYGEN DWINDLES BUT FINGERLINGS LIVELY

**Experiment with Baby Salmon by Fish  
Culture Men has Interesting Result**

Fish must have oxygen to live and thrive but an experiment made last summer at the hatchery which the Fish Culture Division of the Dominion Department of Fisheries operates in the Miramichi district of New Brunswick uncovered some Atlantic salmon fingerlings which got along on less than half the oxygen ordinarily found necessary for these little creatures. Officers of the Division point out very emphatically, however, that the results of the experiment are not to be regarded as conclusive. "It is a case when one swallow is far from making a summer," they say; "interesting but not conclusive."

In carrying on the experiment eight salmon fingerlings, which had reached the feeding stage in life about two months before, were placed in containers holding 980 cubic centimetres of water. The water temperature was 16.5 degrees C. and the percentage of saturation of free or dissolved, oxygen was 96.8. After the containers had been kept tightly corked for four hours the water was tested and it was found that the oxygen saturation percentage had dropped to 33.6. This figure was less than half the minimum percentage which the Fish Culture Division maintains in operating its hatcheries—the average percentage of hatchery saturation is 92.9—but, nevertheless, at the end of the experiment the eight little fingerlings were apparently quite fit. Their only sign of possible distress was an increased respiration.

Fish as candles? Certainly, some of them, sometimes. Oulachons, small oily fish taken in British Columbia waters, are also known as "candlefish", a name derived from the fact that Indians sometimes dry them and use them as candles.

Landings of tuna in the commercial fisheries of Nova Scotia in 1930 amounted to nearly 267,000 pounds. These big fish are caught in Nova Scotia waters only, so far as Canada is concerned, and they are sometimes taken by sport fishermen with rod and line as well as by the nets of the commercial fishermen.

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## DOMINION SCIENTISTS FIND ANSWER TO PACIFIC HALIBUT FISHERY PROBLEM

### Investigations Develop Salt Bath as Effective Preventative of "Yellowing" Commonly Seen in Halibut Taken off Alaska and British Columbia

After several years of seeking a means of controlling the discoloration or "yellowing" of Pacific halibut, Canadian scientists have found that common salt will do the work.

Immersing the fresh caught fish in a twenty per cent salt solution has been found to eliminate the yellowing while, at the same time, having preservative effect. Investigation is being continued with a view to determining several further points, such as the question whether or not the strength of the solution and the time of immersion can both be reduced.

Halibut taken off the Alaskan and British Columbian coasts commonly develop a yellowing of their white ventral surface soon after they are taken from the water, and in 1928 Dr. F. C. Harrison and Dr. Sadler, working under Dominion fisheries auspices, began an investigation as to the cause of this condition. The discoloration they found to be due to an organism called *Pseudomonas fluorescens*. Then came the question: How to destroy the organism responsible for the discoloration?

Harrison and Sadler suggested that the trouble-maker be eliminated through the sterilization of the halibut fishing vessels and the ice which they must use in keeping their catch while at sea. Experiments in this connection were undertaken at the Pacific Fisheries Experimental Station, conducted at Prince Rupert by the Biological Board of Canada, under the direction of the Dominion Minister of Fisheries. These experiments were conducted by Robert H. Bedford, of the Station's staff. Tests in the laboratory showed that formaldehyde could be used satisfactorily, but the laboratory at a scientific station and the fishing vessel at sea are not at all the same thing and when the method used in experiments ashore was tried on three halibut vessels on their trips to

the fishing grounds it failed of success. Mr. Bedford, and workers associated with him, came to the view that "the direct treatment of the halibut was the only likely way by which discoloration could be eliminated."

#### Tests on Shipboard

Then it was necessary, says a progress report by Mr. Bedford, to find a substance which would kill most of the organisms responsible for the difficulty and yet would not injure the fish flesh. Sodium chloride was the substance finally chosen, and so a new use for common salt was found. More laboratory experiments were undertaken and when they had established certain facts the method developed in these tests was tried in a practical way.

Details to one side, the practical application of the method consisted in operating on a halibut vessel on the fishing grounds where, as fish were caught, they were eviscerated and cleaned, placed in a wooden tank fixed to the boat's deck, the tank cover fastened securely down, and a twenty per cent salt solution pumped in.

"The fish were immersed for thirty minutes, the solution then pumped back to the tanks, and the fish immediately thrown into the hold and stowed in ice. . . . By this method there were treated on the fishing ground about 20,000 pounds of halibut. The greater portion was from five to thirteen days old by the time it reached port, and there was not a single fish which showed the slightest trace of discoloration."

This treatment, Mr. Bedford points out, not only destroys the colour-producing organisms but also kills others. "The significance of this is that fish will keep much longer, they will arrive at the port of sale in a much fresher condition, and will remain so for a much longer time than the untreated ones."

## NEW FISHING WATERS IN NORTH MANITOBA

### Ten Additional Lakes Fished by Commercial Fishermen during Past Year

Reports covering 1930 fishing operations in Manitoba bring out the interesting fact that more lakes were fished in northern parts of the province than ever before, notwithstanding that the year's conditions were not favourable to much expansion.

In The Pas district, which, for fisheries administrative purposes, includes all waters in what is generally known as Northern Manitoba, commercial fishermen were at work in 1930 in thirty-eight different lakes, as compared with twenty-eight in the preceding year and only seventeen or eighteen in 1928.

As the review of 1930 operations supplied to the Dominion Department of Fisheries by the Manitoba fisheries authorities points out, there has been "progressive increase in fishing activities in this (northern) area for the past few years, due, of course, to added railway facilities, as well as winter roads, bringing many new waters within profitable fishing distance of the railways." Similar fisheries expansion northward has also been observable in recent years in both the other Prairie Provinces—Saskatchewan and Alberta. For instance, fish from Lake Athabasca, which cuts across the Saskatchewan-Alberta boundary in the north, are marketed regularly both in the United States and Canada. During the present winter catches from Lac le Ronge, in Northern Saskatchewan, have been carried to shipping point by airplane. There is also commercial fishing in various other lakes in northern sections of these two provinces.

#### In the Pas Area

Altogether, the 1930 catch from the thirty-eight lakes fished commercially in The Pas district was almost 2,175,000 pounds as shown by unrevised statistics made up by the Manitoba authorities. Previous reports showed the 1929

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## FEBRUARY SEA FISH CATCH INCREASES ON BOTH COASTS BUT VALUE TOTAL OFF

### Small Gain in Fishermen's Return in British Columbia More than Offset by Drop in Landed Value in Atlantic Coast Division

Sea fish landings in February were larger, both east and west, than they had been in February, 1930, but the lower price ranges prevailing this year brought down the total landed value of the catch to the fishermen, notwithstanding the gain in quantity.

Total catch for the month increased by almost 19,968,000 pounds, as shown by unrevised statistics compiled by the Dominion Department of Fisheries, but landed value decreased by more than \$74,000.

Every province carrying on sea fishing operations reported a gain in landings but only in British Columbia and Quebec was there an increase over the landed value figures for February of last year.

#### *Sixty-five Per Cent Gain in Catch*

All told, the February landings amounted to 51,338,000 pounds as against 31,371,000 pounds in February, 1930—round figures being given in each case—but the landed value of the catches to the fishermen this year was only \$476,215 as compared with \$550,615 a year ago.

In British Columbia, where the herring landings showed a very large increase, the total catch of all sea fish for the month was approximately 41,674,000 pounds, as compared with 22,923,000 pounds in the preceding February, and landed value totalled \$236,905, a gain of \$25,690.

Atlantic coast catch increased by something more than 1,216,000 pounds, totalling 9,664,500 pounds, but landed value was \$100,000 less than in the previous February, or only slightly more than \$239,300. Quebec alone among the Atlantic provinces showed gains both in total catch and total landed value, but February operations in Quebec are only on a small scale and the increases were large in a relative sense only. The catch for the month was about 147,000 pounds, or almost six times the quantity reported in February, 1930, while landed value, \$7,190, represented a gain of \$5,300. The betterment on both sides of the account was due to greatly increased success in the smelt fishery.

#### *On Pacific Coast*

The gain in herring catch featured the month's operations in British Columbia. All told, more than 37,000,000 pounds of herring were taken, while in February, 1930, the catch was slightly less than 20,000,000 pounds. There was gain also in herring landed value but not a gain proportionate to the increase in catch. In February of last year the herring catch was worth \$146,000 to the fishermen in landed value and this year the figure was \$153,775.

Salmon landings and landed value were also considerably greater than a year ago, or 327,000 pounds and a landed value of more than \$37,000 as compared with something more than 90,000 pounds and \$14,625.

#### *In Eastern Areas*

Nova Scotia's catch for the month amounted, in all, to 7,242,000 pounds with a landed value of \$141,735. There was an increase of nearly half a million pounds in landings but, on the other hand, the value of the catch to the fishermen showed a drop of more than \$63,900. Landings of cod, pollock, and halibut, among the principal fishes, fell off but there were gains in the catches of haddock, hake and cusk, smelts, etc.

In New Brunswick there were landings amounting altogether to 2,145,000 pounds, an increase of some 566,000 pounds over the total for February, 1930, but the landed value amounted only to \$84,185 as compared with a little more than \$124,000 last year. The smelt fishery—New Brunswick's most important February fishery—yielded a catch of nearly 1,290,000 pounds and accounted for by far the greater part of the increase in total landings shown by the province. Notwithstanding the large gain in catch, however, smelt landed value, \$70,880, was smaller by almost \$36,000 than in the preceding February.

Comparatively little fishing is done in Prince Edward Island waters in February but the catch for the month, 130,500 pounds, showed some gain. Landed value, on the other hand, showed a decrease of \$1,500 and amounted only to \$6,205.

Quebec, as has already been pointed out, did better than a year ago both as regards catch and landed value.

## LOBSTER LANDINGS IN FEBRUARY DOUBLED

February gave cause for satisfaction to fishermen in those limited areas of the Maritime Provinces where lobster fishing is permissible during the month for it brought them catches more than twice as large as they made in February, 1930, or 28,600 pounds as compared with 12,800 pounds.

The landed value of the catch, as shown by returns made to the Dominion Department of Fisheries, was \$7,160 as against \$5,375 in February of last year.

Lobster fishing in February is permitted only in certain Bay of Fundy waters, and the most important operations are in Charlotte county, N.B. During the February just past the Charlotte county lobster men landed 25,900 pounds and in February, 1930, their catch was only 10,600 pounds. Lobstermen in Saint John county, N.B., and men living in some Bay of Fundy districts of Nova Scotia also landed a few hundredweight during the month, bringing the February total up to 28,600 pounds.

## VANCOUVER ISLAND'S HERRING RUNS HEAVY

Herring runs in various Vancouver Island waters during recent weeks were the heaviest in years. In a report which the Dominion Department of Fisheries received from its Chief Supervisor for British Columbia a short time ago it was stated that herring had been running in the Sechelt Inlet area in greater numbers than for six years past. Similarly, the runs to Clayoquot Sound, on the west coast of the island, were the heaviest in several years, at least, while the fish were also abundant in Nootka Sound. As illustrating the tendency of fish to unexplained vagaries, however, there was the fact that while herring were present in such large numbers in other waters, the run to Kyuquot Sound, up to the time the Chief Supervisor's report was made, had been rather light.

Vancouver Island waters are the chief herring fishing areas of British Columbia and by far the greater part of the catch is used in producing drysalted herring for export to the Orient. In 1929, for instance, about a million hundredweight of herring were taken and more than 800,000 hundredweight of the drysalted fish were put up.

## OVER THIRD OF CANADA'S 1930 SEA FISH CATCH B.C. SALMON AND ATLANTIC COD

### Record Landings of Salmon Put Sea Fish Total for Pacific Coast Above Figures for Atlantic Areas with combined Catches Going Beyond Billion Pounds

Salmon landed by British Columbia fishermen made up slightly more than one-fifth of Canada's total catch of sea fish in 1930 and codfish from Atlantic coast waters more than one-seventh of that, together, these two varieties of fish accounted for a little more than a third of the Dominion's sea harvest of 1,002,505,600 pounds.

The calculations are based only on unrevised figures compiled by the Dominion Department of Fisheries but revision will probably not change the statistics greatly.

British Columbia's salmon catch for the year was almost 216,500,000 pounds, a record total for the province and some 4,000,000 pounds greater than the largest catch previously made. The catch made by the cod fishermen of the Atlantic provinces, on the other hand, was less than in some other years and totalled slightly over 155,125,000 pounds, as compared, for example, with nearly 198,000,000 pounds in 1929.

Pilchards, which, in Canada's fisheries, occur in British Columbia waters only, came third in the list in point of size of total catch in 1930, with Pacific coast herring next in order. In the Atlantic fisheries herring followed next after codfish as regards total quantity landed. Herring catches on the two coasts, taken together, were second only to salmon in size of landings.

The British Columbia landings of sea fish in 1930 totalled a little more than 538,585,000 pounds, or nearly 75,000,000 pounds more than the landings on the Atlantic coast. In the previous year the Atlantic coast production was the larger, or 534,600,000 pounds, in round figures, as against 525,863,000 pounds for British Columbia.

#### Two Years' Landings

Following are given the landings of the principal varieties of sea fish in 1930 as compared with 1929, the unit being the hundredweight, except where indicated to be otherwise:—

	1929	1930
Pacific salmon . . . . .	1,514,038	2,164,636
Atlantic codfish . . . . .	1,978,832	1,551,253
Pilchards . . . . .	1,726,851	1,507,198
Pacific herring . . . . .	1,315,667	1,224,690
Atlantic herring . . . . .	947,577	867,315
Haddock . . . . .	545,409	492,974
Lobsters . . . . .	372,820	410,727
Hake and cusk . . . . .	339,212	288,405
Pacific halibut . . . . .	303,921	254,746
Mackerel . . . . .	152,756	178,158
Alewives . . . . .	87,418	68,087
Atlantic salmon . . . . .	35,287	63,479
Atlantic smelts . . . . .	74,630	57,486
Pollock . . . . .	54,179	51,686
Pacific ling cod . . . . .	48,489	49,039
Atlantic clams . . . . .	49,482	40,034
Atlantic sardines . . . . .	249,194	130,325
Atlantic halibut . . . . .	31,903	27,482
Atlantic scallops . . . . .	17,921	18,723
Atlantic oysters . . . . .	20,734	20,740
Swordfish . . . . .	6,363	11,914
Atlantic tuna . . . . .	2,058	2,666

## NEW ASSOCIATION OF FISHERMEN IN B.C.

Organization of another fishermen's co-operative society has recently been carried out in British Columbia with the formation of the Prince Rupert Fisheries Co-operative Association, which has been incorporated under the British Columbia Co-operative Act. The association will handle salmon for the fishermen and, later on, it may also handle halibut. Possibly it may operate a salmon cannery this year. Provisional directors and officers have been

elected and the association has opened an office at Seal Cove, Prince Rupert.

Other organizations of fishermen in British Columbia include the British Columbia Fishermen's Protective Association, New Westminster; No. 1 District Fishermen's Association, Steveston; the West Coast Fishermen's Association, Ucluelet; the Northern British Columbia Salmon Fishermen's Association, Prince Rupert; and the Deep Sea Fishermen's Union, Prince Rupert. On the Atlantic coast there is a large organization, the United Maritime Fishermen, which is a federation of local associations in different parts of the Maritime Provinces and the Magdalen Islands. All told, there are about 150 locals in the federation.

## FISH CULTURE WIDENS WESTERN TROUT AREAS

Anglers might fish in vain for trout in Brightsand lake, Saskatchewan, three or four years ago but now, thanks to fish culture work carried on by the Dominion Department of Fisheries, the lake yields salmon trout weighing, in some cases, upwards of three pounds. What's happened in the case of Brightsand is another example of the way in which angling areas in different parts of the country have been widened by fish cultural activities.

Brightsand lake, which lies some distance northwest of the Battlefords, was wholly barren of trout until 1926 when the Fish Culture Division of the Department of Fisheries stocked it with salmon trout fry from the hatchery at Fort Qu'Appelle. A second distribution of fry was made in the lake in 1927 and the fish culture men repeated the process again in 1929. That the fry are doing well in their new home was made clear last summer when one of the fish pulled out of the lake by an angler was found to measure eighteen inches in length and to weigh two pounds ten ounces.

### NEW FISHING WATERS

—*Conc.*

catch in the district as less than 2,000,000 pounds and the 1928 catch as less than 1,400,000 pounds.

Moose Lake was the largest producer last year, accounting for 131,700 pounds of whitefish and more than 96,000 pounds of trout and other fish. Athapapuskow yielded over 118,000 pounds of whitefish, nearly 15,000 pounds of trout, and over 18,000 pounds of other fish. Cormorant lake was another of the larger producers, with whitefish catch amounting to nearly 83,000 pounds and the catch of trout and other fish to 65,500 pounds. Reed, Herb, Simonhouse, Kississing, Barrier, Sissipuk and Cranberry also yielded substantial production while lakes with smaller catches included Election, Nokomis, Bartlett, Hassett, Nistoe, Naosap, Schist, Payak, Kissinew, Embury, Manistkwan, Amie, Wabisok, Wedge, Wintering, Rocky, Russic, Pakwa, Egg, Little Herb, Snow, Williams, Cedar, Landing, Setting, Pikwitonina, Cross, and Lost.

Buying Canadian fish means getting food of prime quality and building up a valuable Canadian industry.

## INCREASED LANDINGS FOR FISHERMEN IN PRINCE EDWARD ISLAND LAST YEAR

### Capital Investment and Number of Workers also Showed Gains in 1930 but Adverse Market Conditions Cut Down Production Value Slightly

Prince Edward Island fishermen landed more fish last year than they caught in 1929 and despite unfavourable market conditions the value of the year's production showed a decrease of only a few thousand dollars or \$1,252,478 as compared with a total of \$1,297,125 in 1929.

Sustained interest in the fisheries by Prince Edward Island people was also evidenced during 1930 by an increase of \$25,000 in the capital investment in the fishing industry. The number of persons engaged in the industry likewise increased, though only slightly, and totalled 3,495.

Capital investment in primary operations of the industry—that is, in the operations of catching and landing the fish—increased by something more than \$15,000, reaching \$740,862, and investment in fish canning and curing plants rose to \$189,375, an increase of over \$9,400.

As shown in a preliminary report upon Prince Edward Island fisheries for 1930, prepared by the Dominion Bureau of Statistics in co-operation with the Dominion Department of Fisheries, lobsters continue to be far more valuable than any other part of the catch taken in the waters of the province. The 1930 lobster landings, 8,082,000 pounds, were the largest in some years, and although price recessions brought the marketed value of the production nearly \$10,000 below the 1929 figure it amounted to more than \$303,000.

#### Improved Methods

Cod ranks second among Prince Edward Island fishes in point of annual marketed value. Last year saw an increase of over 1,600,000 pounds in the catch, which amounted in all to more than 6,625,000 pounds, and marketed value of \$155,000 in round figures, showed a gain of nearly \$36,000.

In the past two years expert assistance in improving their processing methods has been given Prince Edward Island cod fishermen by the Department of Fisheries, and the increase in the marketed value of the 1930 catch is believed to have been partly due to this departmental action and the readi-

ness with which a number of the fishermen took advantage of it. In this connection it is pointed out by S. T. Gallant, the Department's Supervisor of Fisheries for Prince Edward Island, that "greater interest was taken by a number of the fishermen during the (1930) season in the dressing and curing of codfish, and better prices were obtained as a result. There was a good demand for the properly cured fish in the United States and in Nova Scotia. The fishermen who cured and dressed their fish properly were well repaid for their efforts, receiving at least one cent more per pound for pickled fish."

The mackerel fishery was more successful in 1930 than it had been in 1929, both in size of catch and marketed value. Clam fishing also showed betterment, and this was the case, too, in several other instances. The smelt fishery, one of the island's most important fisheries, was much less productive, however, than in the previous year. Herring catch also fell off as did the landings of hake and cusk and haddock.

## SUN-DRIED HERRING NEW DISH ON FOXES' MENU

Commercial production of sun-dried herring for use as fox food was tried successfully as a new venture last year by a number of the fishermen in Prince county, Prince Edward Island. The fish were sold to Prince Edward Island fox ranchers and had an average marketed value of a little more than \$8 a hundredweight. At the ranches where they were used, these sun-dried herring were generally included in the foxes' menu twice a week. In preparing the fish for marketing in this way the fishermen split them through the back, washed them in clean water, placed them in a five per cent salt solution for six hours, and then put them out in the open air for the sun to do the rest. At the ranches they were soaked in water for an hour or so before being fed to the foxes.

## VITAMINS MAKE FISH FOODS BODY BUILDERS

### Tasty Canadian Products Help Health and Please Palate at Same Time

Research is bringing out new facts all the time as to the richness of fish foods in vitamins which modern study has shown to be essential to sound health and strength.

A good deal has been said and published as to the vitamin potency of cod liver oil but average folk have not probably heard so much about the vitamin content of fish oils generally. As Norwegian scientists have reported, however, the vitamin content of "the various fish oils . . . exceeds that of every other product which has hitherto been examined, both in animal and vegetable kingdoms." Experiments made by H. N. Brocklesby, now Acting Director of the Dominion's Fisheries Experimental Station at Prince Rupert, B.C., showed that commercial pilchard oil, which is produced in very large quantities in British Columbia, is "a potent source of vitamin D." United States chemists have found that tuna and pilchard oils are "as good as, or better than, cod liver oil in vitamin D" and that salmon oil is as potent in this vitamin as some grades of medicinal cod liver oil. Other similar data as to the vitamins in fish might be cited.

Different fish vary, of course, in vitamin content but all of them apparently are richer in this respect than most other foodstuffs, so that the family which has fish foods regularly on the table may be sure of having in the diet these vitamin substances which are so effective in keeping people strong and healthy. There is the further dietary advantage, moreover, in the use of fish foods that they are generally more easily digested than a good many other foods. More than sixty varieties of fish and shellfish are available from Canadian waters and, properly cooked, they make very tasty dishes. Carelessly cooked, no food is tasty.

Canadian fish foods—none better in quality—are available the year 'round in some form—fresh, frozen, canned, pickled, dried, smoked. And they're rich in body-building content.

Over 15,700 gallons of cod liver oil were produced in the Magdalen Islands in 1930. The production had a marketed value of \$8,030.

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## BIGGER CATCHES MADE BY FISHERMEN OF BOTH CANADIAN COASTS IN MARCH

### Increased Landings of Pollock, Lobsters, Herring and Salmon Prominent in Results of Sea Fisheries but Landed Value Total for Month Shows Decrease

On both coasts of the Dominion, March brought larger catches of sea fish than were landed a year ago and the total fare amounted to 25,996,500 pounds as compared with 24,345,400 pounds in March, 1930.

British Columbia landings totalled approximately 15,662,500 pounds, an increase of roughly a million and a half pounds over the figures for the preceding March. In Nova Scotia the catches amounted, in all, to about 9,615,000 pounds, a gain of 147,000 pounds. New Brunswick's fishermen, however, were not quite so successful as a year ago and their catch of 719,300 pounds showed a decrease of about 30,000 pounds. March is an "off" month for fisheries in Quebec and Prince Edward Island and no landings are made.

While the total catch for the two coasts was larger last month than in the corresponding period of 1930, price conditions were unfavourable, with the result that the landed value of the fish taken was only \$505,500 as against \$762,685. In British Columbia the landed value was \$178,210, a decrease of slightly more than \$186,000. On the Atlantic coast, where there was a drop of a little more than \$71,000, the value of the catches as landed was \$327,295.

#### Provincial Returns

Large increases in the catches of pollock and lobsters, and a substantial increase in halibut catch, were features of the March operations in Nova Scotia, as shown by unrevised statistics gathered by the Dominion Department of Fisheries. There was also increased landings of scallops and clams. Pollock catch amounted to more than 439,000 pounds, as against only 194,000 pounds in March of last year. The increase in lobster landings was almost 260,000 pounds, 970,100 pounds being brought ashore as compared with 710,800 pounds a year ago.

Halibut landings totalled close to 162,000 pounds, a gain of about 50,000 pounds.

On the other hand, the cod catch was only 2,605,500 pounds, which meant a decrease of more than 730,000 pounds; there was a decrease of 360,000 pounds in haddock landings, which amounted to 3,878,500 pounds; and there was a drop in the catch of hake and cusk, as well as a sharp falling off in herring landings.

Landed value figures for Nova Scotia for the month were \$319,486, as compared with \$386,928 in the preceding March.

New Brunswick' cod catch, slightly more than 55,000 pounds, was much larger than last year, and herring landings also increased greatly. More alewives, too, were taken while the landings of oysters, 790 barrels, were greater by 296 barrels than in March, 1930. No sardine landings were reported, however, while a year ago there were catches amounting to more than 56,000 pounds. The past month also saw a considerable decrease in clam and quahaug landings, and scallop catch was only 20 barrels as compared with 405 barrels last year. Landed value of the total catch of all varieties of fish and shellfish during the month was \$7,810, which represented a decrease of more than \$3,500.

#### In British Columbia

On the Pacific coast a large increase in herring catch was noteworthy. In March, 1930, the quantity of herring taken was 8,575,900 pounds but in March of this year the catch totalled more than 12,556,000 pounds. Despite the big gain in catch, however, landed value this year, \$31,175, was about \$1,800 under the figures for the 1930 month.

Salmon landings also showed a substantial gain in British Columbia last

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## FISHERMEN WORK FOR QUALITY PRODUCTION

### Increased Interest in Best Methods Reported from Different Parts of Country

Reports made to the Dominion Department of Fisheries by some of its officers in the field tell of increased attention by numbers of fishermen to the importance of quality production.

This increased attention is due, in part, to the activities of fisheries inspectors who seek to assist the fishermen by giving them information as to the most approved methods of processing fish which the officers have themselves obtained through the educational courses they have been required to take to qualify themselves fully for duty. It is also partly due to instructors who have been employed by the department in some parts of the country to demonstrate the best methods of preparing certain fisheries products.

In this connection the department's supervisor of District No. 2, New Brunswick—which may be described, in a general way, as the north shore of the province—has reported that "the instructor employed by the department in Gloucester county during the past two years is accomplishing much in the way of an improved cure among the cod fishermen." In one area in Gloucester county the greater part of the 1930 cod catch was handled in accordance with improved practice, "and it is expected that more fishermen will follow this method in future." Another evidence cited by the supervisor of the fishermen's desire to turn out products of thoroughly good quality, is the closer attention which is "being paid to the selection of salt for curing" and in the stricter heed that is given to the necessity of cleanliness on the fishing vessels and about the fish houses.

Departmental instructors have done good work in several districts. This has been the case, for example, in parts of Prince Edward Island and the Magdalen Islands, as well as in northern New

Concluded on page 4

## SALMON TALLY SHOWS NEARLY 37,000,000 CAUGHT IN BRITISH COLUMBIA IN 1930

### Number Far Ahead of Figures for Year of Former Record Production in Fishery and More than Twice as Great as Catch Taken Ten Years Ago

When the commercial fishermen of British Columbia had finished counting the salmon they caught in 1930 they found that they had landed close to 37,000,000 of these fine, nourishing fish.

All told, the catch weighed more than 216,000,000 pounds so it will be seen that the salmon averaged between five and six pounds a piece.

Taking the figures as reported to the Dominion Department of Fisheries, the exact number of salmon caught during the year was 36,945,948. That was almost 9,500,000 more fish than were landed in 1926, the year when the largest previous salmon catch was made, and some 10,400,000 more than were caught in 1928, another year of large landings. The figures for several other years were as follows:—

1929....17,339,200	1923....18,931,257
1927....16,016,912	1922....19,648,701
1925....21,987,978	1921....8,961,695
1924....24,573,648	1920....17,275,419

Five varieties of salmon are taken in the British Columbia fishery, and the 1930 catch by varieties showed this count: Pinks, 23,872,907; sockeyes, 5,343,078; chums, 5,114,137; cohoes, 1,207,765; springs, 539,381. Bluebacks to the number of 727,170 were also taken, as well as 141,511 steelheads.

#### Take Catch Census

But somebody may be a bit skeptical. "What," the doubter may say, "keep count of every single salmon that is caught! Surely, they don't do that!"

The fact is, however, that a tally is made of all the salmon that are caught by the commercial fishermen, although, admittedly, in operations which are conducted on such a large scale as the British Columbia salmon fishery, there may occasionally be minor errors in the counting.

Men who hold purse seine licences or drag seine licences or licences to operate trap nets are required to count their fish and to make monthly reports to the Department of Fisheries through its British Columbia officers. Similarly, salmon canners and the operators of curing and cold storage establishments must make report as to the number of salmon obtained from gill-netters and trollers. In this way the department obtains detailed information which can be used in

compiling statements which show not only the total number of salmon landed commercially during the year but the number of each variety of salmon taken and the number of each variety landed with each kind of gear.

Gill nets and purse seines account for the larger catches, and in 1930 the purse seines were first in size of total landings. All told, these seines captured 21,508,000 as compared with 13,570,000 taken in the gill nets. The size of the purse seine catch is explained, chiefly, by the fact that it is with these nets that most of the pinks and chums are taken, and last year there was an exceedingly heavy run of pinks.

#### Catching the Sockeyes

On the other hand, the purse seines accounted for less than 400,000 sockeye, the most valuable British Columbia salmon in point of market price, while the gill net fishermen caught 4,761,231. The gill-netters also caught more than 7,332,000 pinks, over 684,000 chums, over 359,000 cohoes, as well as some 339,000 springs, and smaller numbers of steelheads and bluebacks. Pinks and chums made up all except about 635,000 of the salmon taken by the purse seines.

Trollers landed 1,553,033 salmon, most of them springs, cohoes, and bluebacks. The trap nets, which are permitted in only a small stretch of the Strait of Juan de Fuca, yielded slightly fewer than 165,000 fish. Their catch of cohoes was 58,761 and of sockeyes 56,257. Drag seines are fished by Indians only—no other fishermen may operate these nets—and in 1930 they captured 150,285 salmon. By far the greater part of the catch—133,985—was made up of sockeyes.

All told, 3,024 persons were employed in the fisheries of the Magdalen Islands last year—2,710 men and 314 women. The number was slightly greater than in 1929.

Dried dulse is produced commercially in Charlotte county, New Brunswick, and Annapolis county, Nova Scotia. In 1929 over 112,000 pounds were marketed, having a marketed value of about ten cents a pound.

## WORLD CONDITIONS HINDER FISH EXPORT

### Increased Canadian Sales of Some Products in 1930 but Total Export Lower

As was to be expected, in view of the unfavourable conditions which prevailed in most foreign markets during the year, the Dominion's export fisheries trade in 1930 dropped several million dollars below the figures for the preceding year, notwithstanding that increased business was done in several classes of fish and fish products.

The year's foreign sales of fisheries products, exclusive of oils, amounted in value to \$31,050,000, in round figures, as compared with \$35,969,000 in 1929. The foreign markets absorbed smaller quantities of fish and fish products and price levels were generally lower than in the year before.

Decreases were spread fairly well over the whole list of the fish goods which Canada exports. The largest decrease was in the sales of canned salmon, which amounted to \$6,480,000, as shown by the External Trade Branch of the Dominion Bureau of Statistics, or about \$2,385,000 less than in 1929. There was also a decrease of nearly a million dollars in the exportation of dried cod. Other decreases varied from comparatively small sums to several hundred thousand dollars.

#### Some Gains Made

On the other hand, however, there were several gratifying increases in export trade. Despite the adverse marketing conditions, the Canadian lobster packers sold more canned lobster abroad last year than they had been able to sell in those markets in 1929. Taking round figures, the value of the 1930 export of canned lobsters was nearly \$3,235,000 as against \$3,113,000 in the previous year. Exports of live lobsters also increased.

Fish meal was another product in which more export trade was done. Sales amounted to \$884,000, an increase of some \$59,000. There was increased exportation to the United States, Germany, and the Netherlands, and some business was done with the United Kingdom.

Exports of pickled mackerel and pickled herring and salted alewives likewise showed gains, and this was true, too, in the case of greensalted cod. The exports of fresh and frozen whitefish and several

## GLUE FROM FISH WASTE ONE OF MANY BY-PRODUCTS OF CANADIAN FISHERIES

### Several Thousand Gallons Manufactured Annually in Nova Scotia while Successful Experiments by Federal Scientists Prepare Way for Commercial Produc- tion on Pacific Coast

Perhaps it may be news to a good many Canadians but glue is one of the by-products of the Dominion's fisheries operations every year.

So far, the commercial production has been confined to certain parts of the Nova Scotia coast where, last year, there was an output of 3,465 gallons, a quantity which had been considerably exceeded in some previous years when conditions were more favourable. In British Columbia successful experimental production has been carried on by members of the staff of the Biological Board of Canada but manufacture on a commercial scale has not yet been undertaken.

Other by-products of Canadian fisheries—some of them produced on a large scale—include fish meal, fish oil, fertilizer, herring scales for use in the manufacture of pearl essence, poultry grit, whalebone, etc., as well, of course, as medicinal cod liver oil. All told, the by-products ordinarily add several million dollars to the value of Canada's annual fisheries production; in 1929, for instance, they had a value of \$3,100,000.

#### *Making Fish Glue*

The fish glue produced in Nova Scotia is made from fish scrap—chiefly the skins and heads and other waste from ground fish such as cod, cusk, haddock, etc. "Weight for weight," says Dr. A. H. Leim, one of the Biological Board's scientists in Nova Scotia, "the greatest quantity of glue is obtained from the fish skins. The yield of liquid glue obtained from cod and cusk skin is usually between sixty and eighty gallons per ton of stock. Trimmings and bones yield about twenty-five gallons per ton, and heads only twelve to eighteen gallons per ton." Incidentally, cod and cusk skins being thicker than those of haddock and pollock yield more glue.

In making the glue the fishwaste must first be washed in order to remove the salt naturally present in it. It is then placed in a steam jacketed kettle, covered with water, and cooked for from six to ten hours, a small quantity of acetic acid being added to the water to hasten the breakdown of the stock.

When cooking has been finished, the glue liquor is drawn off from the kettle and twice filtered. After that it is placed in pans where it remains until evaporation has brought it to the desired consistency. Preservatives are then added and the glue is ready for bottling.

#### *Pacific Coast Experiments*

Salmon heads were used in some of the experimental production of glue in British Columbia but in the main experiment halibut heads were the raw material. "While some details of procedure still need investigation," reports L. F. Smith, of the Prince Rupert Fisheries Experimental Station, who conducted the experiments, "it is nevertheless clear that a very serviceable glue can be manufactured from fish heads by the simple expedient of leaching the stock in properly designed leaching vats before cooking. The separated liquor need then only be concentrated and preserved. The alternative method of electro-dialyzing the waste liquors, which are at present discarded, shows sound commercial possibilities."

Using halibut heads, Mr. Smith produced a glue which showed a sheer strength of 2,500 pounds per square inch, when tested in the Forest Products Laboratory at Vancouver. A well known commercial glue, similarly tested, showed a strength of 2,250 pounds to the square inch, while some of the halibut glue, which had been electro-dialyzed to separate the salt from the glue, showed a strength of 2,400 pounds to the square inch. The electro-dialyzed glue, however, dried much faster than either of the other samples.

In making the glue from halibut heads the stock was first washed or leached for seventy-six hours. Then the water was drained off, a few gallons of fresh water, and half a gallon of acetic acid were added, and the mixture was heated with live steam to a temperature of 176 degrees F. for five hours. The cooked mass was next pressed between burlap in a hydraulic press and the press liquors with the addition of phenol as a preservative, were allowed to stand overnight

*Concluded on page 4*

## SUPERVISOR RETIRES IN NEW BRUNSWICK

After nearly twenty-nine years' connection with the Dominion's fisheries service, Supervisor H. E. Harrison, of District No. 3, New Brunswick, ceased duty at the end of March and is now on retiring leave. Mr. Harrison became fisheries supervisor, or, as the office was then called, inspector, in May, 1902. He resigned a little later on but was re-appointed in April, 1903, and from that time until the first of this month he was continuously in charge of District No. 3, which includes the counties of Kings, Queens, Sunbury, York, Carleton, Victoria, and Madawaska, and certain Northumberland county areas.

Following Supervisor Harrison's retirement, Inspector L. H. Parks has been named Acting Supervisor for District No. 3. Mr. Parks has been in the service of the Department since May, 1922.

## LARGER MARKET FOR FISH IN AUSTRALIA

Recent numbers of the Commercial Intelligence Journal, which is issued by the Department of Trade and Commerce, Ottawa, have contained a very illuminating and valuable report on the Australian market for fish products which was written by the Canadian Government Trade Commissioner at Melbourne, Australia. It is a report which will well repay careful reading by Canadian fish exporters and other Canadian fisheries interests. The report covers the Australian market for fish in a good deal of detail, shows what fish foods are most in demand in the Commonwealth, indicates consumer requirements, points out what countries offer competition to Canadian fish producers in the market, and gives much useful information as to the tariff and marketing laws, shipping, and so on. Suggestions as to ways of increasing Canada's fish sales in Australia are also included.

The Commercial Intelligence Journal is published both in English and French editions. It is obtainable from the King's Printer, Government Printing Bureau, Ottawa, and the charge for single copies in Canada is five cents each. The copies containing the report on the Australian market are No. 1477, No. 1418, and No. 1419.

## FAR COUNTRIES BUY B.C. FROZEN SALMON

### Successful Test Shipments Made from Pacific Coast to Distant Overseas Cities

It's a far distance from Canada's Pacific coast to Cairo or Milan, or even to Berlin or Paris or London, but frozen salmon from British Columbia was successfully marketed last year in all these distant markets, and, indeed, in other far away cities as well.

All varieties of Pacific salmon were included in the shipments, but it was found that some markets, such as Paris and Berlin, apparently preferred the coho and the steelhead. The fish were frozen by the Ottesen method. Most of them were shipped from Victoria and they were sent to the distant markets over transportation systems equipped with the proper cold storage facilities.

For the most part, the consignments were in the nature of "test shipments" but the company carrying on the business reported gratifying success. Information which has been given by the company to the Dominion Department of Fisheries is to the effect that all of the shipments reached market in good condition and that a number of repeat orders have been received. It is expected that this year the field of shipment will be extended to Calcutta, but the business done, of course, will be influenced by general economic conditions.

### BIGGER CATCHES—*Conc.*

month, amounting to 338,000 pounds, in round figures, as against 196,100 pounds in March, 1930. There were also increases in the catches of ling, cod and one or two other varieties of fish.

The halibut catch, however, was much less than in the previous March, a condition largely due to some disagreements in the trade which held back fishing operations for a time. The catch for the month was 711,000 pounds, with a landed value of \$67,750, as compared with a catch of 2,214,600 pounds and a landed value of \$232,547.

### WORLD CONDITONS—*Conc.*

other varieties of fish fell off, but the value of the export business done in such other fresh and frozen fish as salmon, lake herring, haddock, clams, cod, and swordfish increased.

Fish foods are especially useful in the diet of children because of their high vitamin content.

Production of canned lobsters in Prince Edward Island last year amounted to 31,935 cases. The pack had a market value of \$635,961.

New Brunswick is by far the largest producer of smoked herring among the Canadian provinces. The fish are of fine quality and make a tasty dish.

Of the 3,530 persons at work in the Prince Edward Island fishing industry last year 678 were females who, for the most part, were employed in fish canning plants.

Alberta's catch of whitefish in 1930 totalled slightly more than 1,900,000 pounds. As compared with 1929, the catch showed a decrease of a little more than 900,000 pounds.

With more than sixty varieties of food fishes taken in Canada's fisheries there's no reason for monotony in the fish dishes put on the family table. The fisherman can be a big help to the housewife.

Alberta fisheries authorities estimate that more than 2,211,000 pounds of fish were caught by anglers in the province in 1930, or several hundred thousand pounds more than in 1929. Pike made up about half the catch.

There is a field in Germany for increased sales of Canadian fish meal. The chief requirements of the German market, as reported by the Canadian Trade Commissioner at Hamburg, is that the meal be rich in protein and low in fat and salt content.

Fish meal production in Fisheries District No. 1, New Brunswick—roughly, the southern part of the province—increased considerably in 1930, amounting in value to \$40,300 as compared with \$29,223 in 1929. Most of the meal produced in this district is made from fish waste.

Production of drysalted herring in British Columbia during the 1930-31 season, which ended some weeks ago, was smaller than for several years past but this condition was due to the market situation and not to any decline in the runs of fish. The herring were plentiful but market conditions in the Orient, where virtually the entire pack is sold, were unsatisfactory, so production was curtailed somewhat.

## B.C. INDIAN HUNTERS GET FEWER FUR SEALS

British Columbia Indians were less successful in hunting fur seals in 1930 than they had been in the preceding year and only 2,297 skins were taken as compared with 3,383 in 1929. Even at that, however, as is shown by reports to the Dominion Department of Fisheries, the number of seals captured last year was above the annual average for some years past.

Under the Pelagic Sealing Treaty none but Indians may hunt fur seals in British Columbia waters, and no craft except Indian canoes may be used in the hunting. Since Indian canoes face very heavy weather, the hunting operations are necessarily limited by weather conditions, and the number of skins landed in British Columbia cannot be taken as any accurate indication of the size of the seal herds which pass the coast of the province on their way to the Pribiloff Islands.

The price received by the Indians for their seals in 1930 averaged approximately \$6 a skin, or much the same price as in the year before, but, of course, the reduction in catch materially lowered the total return.

### GLUE FROM FISH—*Conc.*

so that the oil might separate from the glue liquor. When the oil was skimmed off the liquor was placed in a shallow open pan, heated by a steam coil to a temperature of 158 degrees F., so that evaporation might take place. When evaporation had proceeded sufficiently far, one per cent phenol was added to the glue for preservative purposes.

### FISHERMEN WORK—*Conc.*

Brunswick. Another case of the kind is referred to by the supervisor for New Brunswick District No. 2 in the course of a report to the Department in regard to various matters. "During the (1930) summer and fall," he writes, "a cod splitting and curing instructor was employed by the Government in the Hardwicke area of Miramichi Bay, breaking the fishermen into a new industry for that section of the coast. Excellent cod grounds are located five to ten miles from the shore. It is hoped to have more fishermen engage in the industry in the future years to fill a break in fishing activities between July 31st, when the salmon fishing stops, and the first of October, when oyster fishing begins."

# FISHERIES NEWS BULLETIN

Minister:  
Hon. EDGAR N. RHODES, M.P.

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W. A. FOUND

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## EXPORT RATIO IN FISHERIES TRADE OF DOMINION UP SLIGHTLY LAST YEAR

### Total Value of Foreign Sales Showed Decrease but Volume Rose in Numerous Cases in Spite of Unfavourable Conditions in Most World Markets

Adverse conditions in most markets and declines in commodity prices lessened the value of Canada's export trade in fish and fish products in 1930, as compared with the total for 1929, but the ratio of export trade to import trade showed an increase, although only fractionally.

In the case of a number of fisheries products, the Dominion's foreign sales were considerably larger than the 1929 trade, in point of volume.

For every dollar's worth of fisheries products which were imported in 1929 the Dominion exported similar products worth a little more than nine dollars, and last year the export ratio mounted slightly. Canada's fishing industry made a good showing in export business in a year of exceptional difficulty.

In a few cases in 1930 there were increases in the volume of Canada's import business in fisheries products but, for the most part, the increases were comparatively small. In the export field, on the other hand, there were numbers of instances in which there were very substantial gains in the volume of trade. This was so, for example, as regards fresh clams; fresh and frozen codfish, eels, haddock, lake herring, lobsters, salmon, and swordfish; pickled alewives or gaspereau, herring, and mackerel; greensalted cod; dry-salted salmon; canned lobsters; and cod liver oil. In some other instances, however, such as the cases of sea herring, whitefish, tullibee, halibut, mackerel, and smelts, the volume of exports was smaller than in the year before.

#### *Sold More Fresh Fish*

Most of those varieties of fish which Canada exports in the fresh and frozen forms were marketed abroad in larger quantities last year than in 1929. The most outstanding gain was in the case of salmon. Altogether, some 9,374,000 pounds of fresh and frozen salmon were

exported, or some 2,433,000 pounds more than in the year before. As in other years, the United States and the United Kingdom were the largest purchasers of salmon in these forms. Both countries bought more than they had taken in 1929, the sales to the United Kingdom, 3,112,000 pounds, increasing by more than 1,200,000 pounds. Sales to France and Germany were also greater than they had been in the previous year, but the purchases by these countries, of course, are much smaller than those made by the United Kingdom and the United States.

An interesting development of the year was the exportation of frozen salmon to a number of distant markets where Canadian fish of this kind had not previously been sold. As these shipments were experimental, the total quantity of fish was not large but the exporters believe that it will be possible to expand the trade with these markets in the future.

#### NEW HEALTH KNOWLEDGE

Scientific study has shown that fish flesh and broth are more effective than meat and meat preparations in stimulating the secretion of gastric juice, the digestive fluid of the human stomach, and now it has been established by Dr. S. A. Komarov, through research carried on at the fisheries biological station at St. Andrew's, N.B., that fish skin and skin broth are even more powerful than fish flesh or broth in this regard. Dr. Komarov's discovery is a valuable addition to scientific knowledge as to means of stimulating or diminishing gastric secretion. The St. Andrew's biological station is one of four scientific centres conducted by the Biological Board of Canada under the authority of the Minister of Fisheries.

## FISH STORED WEEKS PRIME IN QUALITY

### Diners Unable to Distinguish between Fillets from Storage and Fresh Fish

Easy to tell fresh fish from a serving of frozen fish that had been kept in cold storage for weeks before being cooked?

Perhaps some people would be sure that the answer is "Yes."

Actually, the truth is that even though it has been kept in storage for a number of weeks, at least, rapid-frozen fish cannot be distinguished from fresh fish on the dining table, and an experiment conducted at the Dominion's Fisheries Experimental Station at Halifax has brought new proof of the fact.

Dr. A. H. Leim, Director of the station, describes the experiment briefly in a recent progress report issued by the Biological Board of Canada, which operates under the authority of the Minister of Fisheries. An extract from Dr. Leim's summary is given below, but it may first be explained that "Ice Fillets," to which he refers, are prepared by the rapid-freezing process, a process in which freezing is accomplished by means of low temperature brine mixtures.

"Ice fillets of halibut, cod, and haddock were frozen from carefully selected fresh fish," Dr. Leim writes. "They were stored at zero Fahrenheit. At intervals samples were cooked and tested by from six to ten individuals who were asked to record their preference as between two unknown pieces of fish presented to them. One piece was from the frozen store, the other was fresh unfrozen.

"The result of repeated tests indicated that at the end of two months it was impossible to distinguish the fresh and frozen haddock, but that the difference was sufficiently marked for distinction at the end of three months.

"For the cod and halibut there was no order in the choices at the end of five months, indicating that no marked changes had occurred in the fish stored under these conditions," and, as a mat-

(Continued on page 5)

## UNSOLVED MYSTERY CAUSE OF PERIODIC FLUCTUATIONS IN ATLANTIC SALMON

### Investigation by Dominion Fisheries Scientists Reveals Striking Phenomenon with Years of Salmon Scarcity Agreeing with Like Times for Fur-Bearing Animals

Recent study of the Atlantic salmon by Dominion Government experts has revealed the striking phenomenon that since 1871, or approximately that time, periodic scarcity of the fish has occurred in definite cycles averaging 9.6 years.

Still more interesting—and probably it will be amazing to most people—is the further fact that the years of salmon scarcity have agreed with the years of scarcity for different varieties of Canadian fur-bearing animals!

What the explanation of these remarkable conditions may be, no man knows. It is a problem which is still a puzzle to the scientists.

The study of the Atlantic salmon has been carried on by Dr. A. G. Huntsman, Senior Director of the Biological Board of Canada, which, in effect, is the scientific division of the Dominion fisheries administration. In a recent progress report Dr. Huntsman has briefly summarized some of the chief points brought out in the investigation, which is of first rate importance for this reason, among others, that study of the fluctuations in the abundance of the fish is study of a subject which directly touches the fishermen's livelihood. This particular investigation, it may be noted, is only one of a good many made by research workers under the auspices of the Dominion fisheries authorities with a view to assisting in the effective development of the country's great fisheries resources and their conservation by intelligent methods.

#### *Mysteries of Nature*

Atlantic coast salmon statistics have been collected by the Dominion Department of Fisheries all through the past sixty years, Dr. Huntsman points out, and a study of these figures has "revealed a periodic scarcity occurring, on the average, every 9.6 years, commencing about 1871. . . . The years of (salmon) scarcity agree with those found for Arctic foxes and rabbits of the Northwest as shown by the fur returns of the Hudson's Bay Company, and the average time between years of scarcity for seven different fur-bearing animals is practically 9.6 years, as found for the salmon. No one knows what is the

cause of this phenomenon that is so widespread. When will this great mystery be solved that affects the livelihood of the fishermen?

"The story is far from simple," the report goes on, but "there is definite evidence that the mysterious cause is responsible, not only for a periodical scarcity every 9.6 years, on the average, but also for a definite and peculiar course of the fishery during a period of 48 years, and then repeating. Exceptionally high catches in the '70's were repeated 48 years later in the '20's."

#### *Runs on Miramichi System*

But these are not the only interesting and striking facts that the salmon study has been revealing. One point that has been under examination, as Dr. Huntsman says, has been the recurrence of a big catch of salmon in the Miramichi system in New Brunswick every three years since 1915. There is some outward similarity between this Miramichi condition and the condition in the Fraser River system in British Columbia where the "big" year for sockeye occurred every four years, but the sockeye and the Atlantic salmon are altogether different fish. The sockeye is *Oncorhynchus nerka* and the Atlantic salmon *Salmo salar*. Spawning in the sockeye runs takes place every four years, although the individual fish spawns once only, "so the offspring of a 'big' run would come back four years later." On the other hand, a study of scales by R. B. Kerr and A. A. Blair has shown that most Miramichi salmon take six years from spawning to spawning. What, then, is the explanation of the greater number of Miramichi fish every third year? Meeting the question Dr. Huntsman notes first that the important point is that Miramichi salmon spend three years in the river before going to sea as smolts, and he continues as follows:—

"A big run of spawning fish will so fill the river with fry, getting larger every year, that fry coming from the spawnings of subsequent years have little chance of getting food, and may even serve as food themselves for their older cannibalistic brethren. When the

(Concluded on page 4)

## SEIZED ALIEN CRAFT LOSE COURT APPEALS

### Forfeiture Order of B.C. Vice-Admiralty Judge Upheld by Dominion Supreme Court

In recent decisions the Supreme Court of Canada upheld judgments of the Vice-Admiralty Court at Victoria, B.C., in declaring four United States salmon trolling vessels forfeit to the Crown because they entered British Columbia waters for a purpose not permitted by the law of the Dominion.

The four vessels were seized in June of last year by the patrol launch *Rivadis*, of the Dominion fisheries services, when they were found anchored in territorial waters off the Queen Charlotte Islands. Proceedings against the boats were initiated by the Dominion Department of Fisheries on the ground that they had entered Canadian waters for a purpose not permitted by law. After hearing evidence in the Vice-Admiralty Court, Mr. Justice Martin ordered the vessels forfeited to the Crown. Appeals against these judgments were taken on behalf of the vessels, on several grounds. They were heard by the Supreme Court at Ottawa a short time ago and were disallowed, so that the original forfeiture order stands. What disposition will be made of the vessels by the Crown has not yet been decided.

Several points of general interest were established by the Supreme Court findings. For instance, it was established that the Treaty of 1818 between Great Britain and the United States, regarding the use of Canadian waters and ports by United States fishing vessels under certain circumstances, does not apply to the Pacific coast. It was also established that the right of foreign fishing ships to enter British Columbia waters for purposes of shelter from stress of weather is limited to refuge from conditions which place the vessels in actual peril, and that a foreign vessel cannot, by the use of boats that are not suited to the ordinary incidents of the weather of the international fishing ground, obtain a right to refuge in territorial waters from weather that would not disturb suitably built craft.

Experience in different countries has shown that fish meal in the stock food means more success in stock raising. Meal of good quality is one of the by-products of Canada's fisheries.

## PRAIRIE PROVINCE FISHERIES VALUE CUT BY ADVERSE MARKET CONDITIONS

### Capital Investment in Industry for 1930 Stood Up Well despite Difficulties and Unfavorable Factors Encountered as Result of World Economic Unsettlement

Like others the world over, the fishermen and fisheries interests in the Prairie Provinces found 1930 a difficult year, and the result of unfavourable market conditions was a diminished production and a decrease in the marketed value of the catch.

It is noteworthy, however, at the same time, that notwithstanding the difficulties that had to be met, the fishing equipment in operation was only slightly smaller in value than that employed during the preceding year.

So far as production is concerned, the three Prairie Provinces and the Yukon Territory together marketed approximately 33,818,500 pounds of fish in 1930, with a value of \$2,491,935 on the market, as compared with 47,298,800 pounds and a value of slightly more than \$4,075,000 in 1929. There was thus a decrease of 28 per cent in quantity in 1930 and a decrease of 39 per cent in marketed value. In making comparisons in the last two years, however, it should be kept in mind that the 1929 totals reached record levels, considerably above the average for other recent years.

All three of the Prairie Provinces reported decreased value of production last year, and, of course, that was not surprising in view of the unsettled market conditions and the price declines which occurred. In Manitoba, the biggest producer of the three, the marketed value for the year totalled \$1,806,600, in round figures, or some \$900,000 less than in 1929. Alberta's production was valued at slightly more than \$421,000, a drop of \$310,000, and Saskatchewan's catch brought \$234,500 on the market as against more than \$572,000 in the year before. There were decreases, both as to catch and marketed value, in the case of nearly all the more important varieties of fish in each of the provinces.

#### Whitefish Production Off

The combined catch of whitefish, which ranks first in importance among Prairie Province fish, was 2,100,000 pounds less than in 1929, although the Manitoba landings increased slightly, and it had a marketed value of \$903,000

as compared with a little more than \$1,400,000.

The pickerel and tullibee fisheries, which are very important in Manitoba and are also prominent in the other two provinces, were much less successful, on the whole, than in the preceding year. The Saskatchewan catch of pickerel and tullibee was somewhat larger than in 1929, but in Manitoba and Alberta there were smaller landings; in Manitoba the decreases were substantial. The catch and value of pike also fell off in each of the three provinces.

#### Gain in Yukon

Production value for the year in the Yukon Territory, where fisheries operations are on a limited scale only, was \$29,510, which meant a gain of slightly more than \$4,700. The betterment was chiefly in whitefish catch and value.

Statistics prepared by the Dominion Department of Fisheries and the Dominion Bureau of Statistics show some decrease in the capital investment and the number of persons employed in the fisheries of the Prairie Provinces and the Yukon last year. In Manitoba the number of fishermen was greater by a hundred than it had been in 1929 and there was a very slight increase in the case of the Yukon but, on the other hand, there were decreases in Saskatchewan and Alberta so that the net result was a total personnel of 6,949 in the four areas as compared with 7,522 a year previously.

In the Yukon the capital investment increased by several thousand dollars. In Manitoba it decreased by about \$7,500, in Alberta by a similar amount, and in Saskatchewan by something more than \$34,000. By areas the investment for the year was as follows:—

Manitoba . . . . .	\$1,309,141
Saskatchewan . . . . .	87,313
Alberta . . . . .	539,767
Yukon . . . . .	16,220

Greyfish, or dogfish, are sometimes a nuisance to fishermen but they have their uses, too, and in the first week of March a single British Columbia reduction plant used 186 tons of these fish in the manufacture of oil and fertilizer. Greyfish are also used to some extent in reduction works in Nova Scotia.

## PLEDGE THEMSELVES TO PROTECT FISHERY

Recognizing the importance of conserving the lobster resources of the Dominion, which occur in Atlantic coast waters only, the fishermen of the eastern section of Pictou county, Nova Scotia, have again taken public oath to return immediately to the sea any berried lobsters which they may find in their traps. The men adopted this course of formally pledging themselves four years ago and they believe that their loyalty to the promise has been effective in helping to maintain the lobster fishery on their part of the coast. They took the oath for the 1931 season before the fishery inspector for their district at Lismore early in May.

Under the lobster fishery regulations it is forbidden to fish for, catch, kill, or sell any berried lobsters, except for hatchery purposes as provided for in the Fisheries Act, but unscrupulous fishermen, of course, might sometimes violate the regulations and chance to escape detection and penalty. The result of any such breaches of law must be injury to the lobster fishery for the future. The course followed by the men of the Lismore area is one which makes for conservation of the lobster resources and their perpetuation as a source of livelihood for the fisherman.

#### FISH STORED—(Contc.)

ter of fact, some fillets of cod which were kept in storage at four degrees under zero, in another of the station's experiments, were found to be quite suitable for use as food ten months after they were first frozen.

Wonderful progress in freezing and storage methods has been made in the past few years, and a good many of the forward steps stand to the credit of the fishing industry. Canadian consumers who patronize reliable dealers can be sure of good fish all the year 'round.

#### VITAMINES FROM CANADA

Canada's exports of cod liver oil, which is especially valuable from the health standpoint because of its high vitamine content, totalled 172,423 gallons in 1930, an increase of almost 3,000 gallons over the 1929 figures. The United States was the chief buyer.

Canadian salmon are rich in Vitamine D. content. That's one reason why they are so valuable in the diet.

## SMALLER LANDINGS OF SEA FISH ON BOTH COASTS OF DOMINION IN APRIL

### Herring Increases General in Atlantic Provinces and Nova Scotia Halibut Fishery More Productive than in April 1930, but other Fisheries East and West Show Decreases

Canada's sea fishery operations were not so successful in April as they had been in April of last year and there were decreases both in total catch and in landed value of the catch to the fishermen.

The decreases occurred on the Atlantic and Pacific coasts alike and the landings for the Dominion totalled some 23,773,000 pounds, with a value to the fishermen of a little more than \$820,000, as compared with a catch of over 34,500,000 pounds and a landed value of \$1,516,930 a year ago. The figures for April, 1931, are unrevised statistics gathered by the Dominion Department of Fisheries but revision will probably not change them in material respects.

The following statement shows the results of operations in April, 1931, and April, 1930, separated according to coasts:—

Atlantic Coast		
	April, 1931	April, 1930
Catch. . . . .	18,783,500 lbs.	25,358,800 lbs.
Landed value . . . \$	576,885	\$ 940,550
Pacific Coast		
Catch. . . . .	4,979,800 lbs.	9,180,400 lbs.
Landed value . . . \$	243,500	\$ 576,380

In British Columbia the halibut fishery, the most important April fishery, was affected during the month by some temporary local differences in regard to the method of marketing the catch, and landings amounting to 1,790,000 pounds were less than half as large as the catch of April, 1930, when some 3,850,000 pounds were brought ashore. Herring landings were also very much smaller than a year ago. The salmon catch, about 538,000 pounds, showed a drop of 187,000 pounds

#### On the Eastern Coast

On the Atlantic Coast April operations in Prince Edward Island and Quebec sea fisheries are on a limited scale only, but the April just past saw a large increase in the Prince Edward Island herring catch and a relatively large increase in the Quebec landings of the same variety of fish. In New Brunswick the total catch of fish for the month was not much smaller than the catch for April of last year, or 4,244,500 pounds as against 4,350,500 pounds. Landed value, however, was only \$28,735 as against \$45,000. As in Quebec and

Prince Edward Island, there was a large gain in herring landings and a gain in herring value. The catches of cod and alewives were also larger than last year but market conditions were such that total landed values decreased. The sardine fishery dropped off sharply. About 4,470 barrels of sardines were taken, with a landed value of \$3,870, while in the preceding April the catch went above 9,600 barrels and landed value was more than \$15,930. There were also decreases in catch and value in the case of the clam and lobster fisheries of the province.

In Nova Scotia the halibut and herring fisheries were more successful than last year but practically all of the other principal fisheries showed decreases. The halibut catch was 386,600 pounds, a gain of some 142,000 pounds, and it had a landed value of \$45,830, an increase of nearly \$15,700. Herring catch was slightly more than 1,629,000 pounds, with a landed value of \$10,777. In the previous April the catch was 904,300 pounds and landed value was \$9,440. The decreases in the case of the cod and haddock fisheries were large, both as to catch and landed value. The figures for the hake and cusk, pollock, alewives, scallop and lobster fisheries were also smaller than last year.

#### UNSOLVED MYSTERY—(Conc.)

latter, in the spring after their third birthday, become smolts and go to sea, they leave the river suddenly clear for the fry of the spawning three years following that from which they came. Hence, a big year favours another big year three years later. As the offspring of a big year come back to spawn in six years' time, they fit perfectly into the three-year cycle, and two lines or series of generations keep big years going, alternating every three years."

Incidentally, the Atlantic investigation has also shown that the salmon of the St. John River system in New Brunswick tend to have big runs every two or five years, those of the waters of Restigouche county, N.B., and Bonaventure and Gaspé counties, Quebec, a big run every four years, and those of the Minas system in Nova Scotia every two or four years.

## BARREN STREAM MADE FRUITFUL OF TROUT

Another example of what may be accomplished by intelligent fish culture toward building up fishery resources is supplied by the case of Bull's Creek, a New Brunswick stream, where trout had not been found for years but are now apparently present in large numbers, following distributions of hatchery fingerlings in several recent seasons by the Fish Culture Division of the Dominion Department of Fisheries

Speckled trout fingerlings from the department's Florenceville hatchery were distributed in Bull's Creek in 1928. A second distribution was made in the following year and a third in 1930. All told, 190,000 fingerlings were put in the stream. A good many of them evidently thrived, for a week or two ago the department's inspector in that territory, on examining fish that were trying to make their way up some small falls in the creek, found that they were young trout and that they seemed to be "very plentiful." This condition, he reported to the department at Ottawa, was apparently due to the fingerling distributions "as no fish have been seen there for years before this spring."

There are numerous other cases in which the department's fish cultural work has increased the runs of fish in different waters or has established various kinds of fish in streams or lakes previously barren of them. There has been the successful introduction of Rainbow trout in Prince Edward Island, for example, the introduction of Brown trout in part of New Brunswick, Loch Leven trout in Prairie Provinces areas, Speckled trout in Jasper National Park, and various other cases, both east and west.

#### CANADIAN CAVIAR

Caviar, or prepared sturgeon roe, is one of the annual products of Canada's fishing industry, although the output is never very large. The chief production of caviar is in Ontario, where the largest catches of sturgeon are made.

#### MORE YUKON TROUT

Commercial fishermen in the Yukon Territory more than doubled their catch of trout in 1930. All told, they landed 27,000 pounds, as compared with only 12,000 pounds in 1929, and marketed the catch for \$6,750.

# BULLETIN DES RENSEIGNEMENTS SUR LES PÊCHERIES

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Ministre:  
Hon. EDGAR N. RHODES, M.P.

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Sous-ministre:  
Wm. A. FOUND

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N° 20

## SAUVEGARDE DES TROUPEAUX DE PHOQUES PAR AVIONS

Le Canada découvrit une nouvelle application de l'avion quand pour la première fois cette année il fit usage d'hydroplanes dans la sauvegarde des troupeaux de phoques à fourrure, à l'époque de la migration septentrionale de ces mammifères marins vers les îles Pribilof dans la mer de Behring.

La surveillance de cette migration fut exercée par l'"Armentières" et le "Vancouver", pourvus chacun d'un des avions du Service de l'Aéronautique du Canada. L'avion 110 fut annexé à l'"Armentières", qui resta affecté à la protection des troupeaux de phoques pendant trois semaines en avril, tandis que le 108 fut rattaché au "Vancouver" qui fut chargé du même travail pendant une période identique en mai. Par suite de conditions climatiques défavorables aux envolées, l'avion adjoint à l'"Armentières" fut gêné dans ses opérations. Plus tard, toutefois, le temps s'étant révélé plus propice aux sorties, l'hydroplane, accompagnant le "Vancouver", réussit à tenir l'air pendant une durée supérieure à trente-six heures. Les exercices de surveillance par avion eurent lieu à l'ouest de l'île Calvert, au nord et à l'ouest du passage Millbanks, au nord de l'île Graham, dans le détroit de Hécate, et ailleurs.

Aux termes du Traité relatif à la Chasse des Phoques à fourrure, ces animaux doivent être sauvegardés contre toute tentative de capture par entreprise privée, sauf que les aborigènes des pays intéressés — Canada, Etats-Unis, Japon et Russie — sont autorisés à chasser les phoques au moyen de harpons lancés de bateaux mus à la rame ou à la voile. Chaque année, à l'époque de la migration des phoques vers le nord et à leur passage au large du littoral de la Colombie britannique, le Canada, en exécution du traité, s'efforce d'assurer à ces mammifères toute la protection voulue. Les Etats-Unis font de même dans les eaux sises au large de certains secteurs de leur territoire.

## PRISES DE POISSON DE MER EN MAI

Les pêcheurs de la Colombie britannique ont réalisé en mai des prises de poisson de mer un peu plus fructueuses qu'en la période correspondante de l'année antérieure mais comme les exploitants de la côte orientale réussirent moins bien dans leurs entreprises de pêche du mois dernier, il résulte que, dans l'ensemble, la production des pêcheries maritimes en mai accuse un déclin de quelque 3,200,000 livres en poisson et de \$765,900 en valeur au débarquement. En mai 1930, en effet, la valeur du poisson au débarquement avait été de \$2,954,440 par comparaison à \$2,188,540 dans le même mois de la présente année.

La tabulation des données statistiques propres aux deux côtes pour le mois de mai 1931 et le mois de mai 1930, telle que dressée par le ministère fédéral des Pêcheries, fournit les résultats suivants, la statistique de mai 1931 restant susceptible de révision:

	Côte orientale	
	Mai 1931	Mai 1930
Prises, . . . . .	85,292,700 lvs	89,291,300 lvs
Valeur au débarquement, . . . . .	\$1,804,595	\$2,380,052
	Côte occidentale	
Prises, . . . . .	8,025,400 lvs	7,246,900 lvs
Valeur au débarquement, . . . . .	\$303,945	\$573,490

En Colombie britannique, au chiffre de 1,525,400 livres, les prises de saumon du mois dernier furent de quelque 644,000 livres inférieures à celles de mai antérieur. Les cours pratiqués pour le poisson ayant été beaucoup plus faibles qu'en 1930, les pêcheurs de saumon ne purent réaliser au débarquement de leurs prises que \$92,800 par comparaison à plus de \$226,000 en mai antérieur. Au chiffre de 3,288,400 livres, les débarquements de flétan furent de quelque 412,000 livres supérieurs au rendement d'il y a un an, mais par suite de l'abaissement des prix, la valeur au débarquement n'en fut que de \$235,995, soit un décroissement d'environ \$50,000. La pêche des harengs en mai 1931 s'est révélée plus fructueuse qu'en mai 1930, tant en ce qui concerne les prises de ce poisson que leur valeur au débarque-

ment. On signale aussi des gains dans la pêche d'un ou deux autres poissons mais d'une façon générale, on constate des diminutions dans les recettes monétaires.

La Nouvelle-Ecosse, qui des quatre provinces atlantiques est la plus forte productrice de poisson, s'est distinguée par des prises qui surpassèrent de 6,760,000 livres celles de mai 1930. Ce résultat est attribuable à une surabondance de morue jointe à un exercice intensif de la pêche de ce poisson. Mais au Nouveau-Brunswick, en l'île du Prince-Edouard et en Québec, la pêche subit un fléchissement de même que la valeur du poisson au débarquement. On constate aussi un abaissement de cette valeur en Nouvelle-Ecosse malgré le fort accroissement signalé dans les quantités de poisson pêchées.

Dans l'ensemble, les pêcheurs de la Nouvelle-Ecosse prirent en mai 39,013,700 livres de poisson d'une valeur de \$1,210,560, en regard de 32,253,800 livres et de \$1,463,290 en mai 1930. Le trait saillant des exploitations de pêche du mois dernier consiste en un accroissement de 100% constaté dans les débarquements de morue: 14,764,000 livres par comparaison à 6,700,300 livres en mai 1930. La valeur de ce poisson au débarquement fut aussi le double de celle propre à mai 1930: \$228,975 contre \$112,854. La pêche des saumons fournit de meilleurs résultats qu'en mai de l'année dernière tant en ce qui concerne les prises que leur valeur au débarquement. Il en fut de même de la pêche des myes ou clanques et des praires. Les pêcheries de hareng, de gasparot, de flétan, de homard et d'aloëse caractérisèrent par une plus forte production de ces poissons mais accusèrent un fléchissement dans les valeurs au débarquement. Les pêches d'aiglefin, de lieu, de colin, de merlan, de maquereau et de pétoncles ne furent pas aussi fructueuses que l'année passée.

Au Nouveau-Brunswick, les prises se totalisèrent à environ 25,731,000 livres d'une valeur de \$278,180 au débarquement par comparaison à 31,998,500 li-

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## DES AVANTAGES QU'ONT RETIRÉS LES PÊCHEURS DE L'ENSEIGNEMENT DES PROCÉDÉS MODERNES DE TRAITEMENT DE LA SUBSTANCE DU POISSON

Les exploitants ont retiré d'importants avantages des mesures prises, en ces deux dernières années, par le ministère fédéral des Pêcheries en vue de constituer un personnel d'experts et de moniteurs chargés de vulgariser parmi les groupements de pêcheurs de la côte atlantique la connaissance technique des procédés modernes relatifs à la manutention et au traitement de la chair de morue.

C'est ainsi qu'en l'île du Prince-Edouard, où il ne se préparait pas de morue désossée ou sans arêtes, et où des milliers de caisses de cette denrée comestible étaient importées chaque année, les pêcheurs furent mis au courant des particularités relatives au mode de fabrication de ce produit avec le résultat que les exploitants de l'île ne tardèrent pas, tout en subvenant à la consommation locale de cet article alimentaire, à être en mesure d'en effectuer des expéditions à l'étranger. De même, les enseignements et les conseils des experts à l'emploi du département ont contribué tant aux Îles-de-la-Madeleine qu'en certaines régions septentrionales du Nouveau-Brunswick, à l'amélioration des procédés de traitement du poisson pratiqués par les pêcheurs. En un quartier de pêche du Nouveau-Brunswick, les moyens d'action du département ont servi à orienter l'attention d'un certain nombre de pêcheurs vers l'exercice de la pêche de la morue, une exploitation qu'ils ne s'étaient jamais préoccupés d'effectuer sur une base commerciale.

L'instruction, fournie par les experts en procédés techniques de pêche, n'est que le complément des leçons dont bénéficient les exploitants de la part des inspecteurs de pêche, car ces derniers, grâce à l'institution de cours spéciaux, sont en mesure de renseigner les intéressés sur la mise en application des procédés relatifs à la manutention et au traitement de la substance du poisson.

L'expert, chargé de l'instruction des pêcheurs en l'île du Prince-Edouard, fut envoyé en cette province il y a deux ans avec mission spéciale d'y enseigner les méthodes relatives au saumurage de la morue en vue de la production du poisson sans arêtes. A cette époque, ceux d'entre les importateurs des Etats-Unis qui étaient disposés à acheter de la morue saumurée, en l'île du Prince-Edouard, se déclaraient incapables de donner suite à leur projet par suite de la qualité inférieure des produits. En ce temps-là aussi, la province importait des articles de morue désossée mais n'en fabriquait pas. A cet

égard, l'énoncé suivant, émané du ministère, comporte un exposé net des résultats de cette campagne d'enseignements: "Non seulement les pêcheurs apprirent-ils à saigner et trancher leur poisson avec soin, mais les négociants eux-mêmes eurent l'avantage d'être mis au courant des véritables procédés de salage et de traitement. En certaines régions où les pêcheurs se conformèrent parfaitement aux enseignements reçus, les cours manifestèrent immédiatement une tendance vers la hausse. C'est ainsi qu'en des localités où les prix avaient été de \$3.50 le quintal pour la grande morue tranchée et de \$2.50 pour la petite, les exploitants bénéficièrent sans retard de \$5.30 pour la grande morue, de \$4.50 pour la moyenne et de \$3.25 pour la petite, à condition, naturellement, que la qualité en fut jugée satisfaisante. Un des principaux importateurs des Etats-Unis ne tarda pas à s'intéresser de nouveau à ce négoce et se porta acquéreur de fortes quantités de morue. Les épiciers en gros de l'île furent amenés à prêter leur attention à la fabrication du poisson désossé telle que pratiquée sous notre direction. De cet ensemble de faits, il est résulté que les exploitants de l'île du Prince-Edouard furent bientôt à même, tout en subvenant à la consommation locale de morue désossée, d'expédier une part de leurs produits aux Etats-Unis.

"La campagne d'enseignements relatifs aux opérations de tranchage et de traitement de la morue fut poursuivie dans le cours de l'année 1930. Par suite du relèvement, constaté dans la qualité comestible du produit, plus de 1,000,000 de livres de morue saumurée furent expédiées l'année dernière à des négociants des Etats-Unis qui n'en avaient jamais auparavant acheté en l'île du Prince-Edouard."

Certaines constatations et observations effectuées en 1929, ont servi à convaincre les autorités que les pêcheurs de morue de l'île du Prince-Edouard ne pouvaient avec profit pratiquer leurs exploitations par suite de l'usage de bateaux dont les dimensions les forçaient à limiter l'exercice de la pêche à des secteurs trop rapprochés du littoral, par suite aussi de la pratique de certains procédés de pêche

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## CANALISATION HYDRAULIQUE MISE AU SERVICE DE LA PISCICULTURE

A titre d'expérimentation, le service de pisciculture du ministère fédéral des Pêcheries a décidé de mettre à exécution cette année certain projet tendant à utiliser le canal de dérivation de l'usine municipale d'énergie électrique aux chutes Nictaux, en Nouvelle-Ecosse occidentale, à la capture et au parage des saumons reproducteurs en vue d'opérations piscicoles.

Ce plan de travail comporte aussi le dénombrement des géniteurs qui remontent la rivière Nictaux au moyen de l'échelle à poissons en existence aux chutes de sorte qu'à la fin de la saison on sera en possession d'un relevé statistique exact donnant le nombre journalier des saumons migrateurs qui auront franchi cet obstacle, un genre de renseignements qui sera très utile dans la détermination des moyens à prendre à l'avenir pour se procurer à cet endroit des saumons de migration précoce.

Au 13 juin, 528 saumons avaient fait l'ascension de ce dispositif de franchissement. Sur ce nombre, 300 furent retenus captifs pour la reproduction. Les autres furent laissés libres de poursuivre leur route.

Le plan de travail des chutes Nictaux, qui fut réalisé avec l'assentiment du bourg de Middleton, exploitant des forces hydrauliques à cet endroit, comporte plusieurs avantages. Il est, en premier lieu, exécuté en une rivière où s'opère une montée précoce de saumons migrateurs. En deuxième lieu, sa réalisation n'a entraîné au début aucun fort déboursé et la poursuite en est peu coûteuse. L'exécution en est simple et ne nécessite aucune manutention des poissons, si ce n'est celle ayant trait au coulage des œufs à l'automne.

Dans leur ascension de la rivière, les saumons s'engagent naturellement dans la passe migratoire conduisant du bas de la digue au canal de dérivation. Au sommet de l'échelle à poissons est installé un parc de pêche dont le fond est peint en blanc et dans lequel s'introduisent les poissons. Une issue garnie d'ailes conduit du parc dans le canal. La coloration blanche du plancher du parc rend possible l'examen des saumons sans qu'il faille les manipuler. Or fait choix, pour le parage, des géniteurs ne portant ni blessures, ni empreintes de filet. Une fois cette sélection

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## VALEUR DES PÊCHES PROPRES AUX PROVINCES CENTRALES

Comme partout ailleurs, les pêcheurs, les fabricants de produits industriels de pêche et les négociants en poisson des provinces centrales n'ont pas été sans éprouver en 1930 maints contretemps dans l'exercice de leurs exploitations respectives. L'insécurité des marchés et le ralentissement des échanges commerciaux se sont, en effet, traduits par un décroissement de la production des pêcheries et un avilissement des cours pratiqués pour le poisson.

Il convient de signaler, toutefois, qu'en dépit des contrariétés qu'eurent à surmonter les intéressés, la valeur du matériel d'exploitation utilisé par eux dans l'exercice de l'industrie poissonnière n'accuse qu'un faible fléchissement par rapport à l'année antérieure.

En ce qui concerne la production, les trois provinces centrales et le territoire du Youkon ont fourni en 1930 un rendement de 33,818,500 livres de poisson d'une valeur marchande de \$2,491,933 par comparaison à 47,298,800 livres d'une valeur légèrement supérieure à \$4,075,000 en 1929, soit en 1930 une diminution de 28 pour cent en quantité et de 39 pour cent en valeur marchande. En établissant, toutefois, la comparaison entre les résultats propres à chacune des deux dernières années, il ne faut pas perdre de vue qu'en 1929, la pêche y produisit un rendement sans précédent, bien supérieur à la moyenne des quelques années antérieures.

Les trois provinces centrales ont accusé l'année passée un décroissement dans la valeur marchande du rendement en poisson. Cette condition n'a pas lieu de nous surprendre si l'on tient compte de l'insécurité du marché et du déclin constaté dans les cours. En la province du Manitoba, la plus forte productrice des trois, la valeur marchande de l'année s'est chiffrée à \$1,806,600, en chiffres bruts, soit \$900,000 de moins qu'en 1929. La production de l'Alberta s'est montée à un peu moins de \$421,000, soit un fléchissement de \$310,000, cependant que la Saskatchewan ne réalisa sur le marché que \$234,500 contre plus de \$572,000 l'année d'avant. On constate des décroissements, tant dans les prises que dans leur valeur, à l'égard de presque toutes les principales espèces de poisson propres à chacune des provinces.

L'ensemble des prises de corégone, le plus important poisson des provinces centrales, fut de 2,100,000 livres de moins qu'en 1929 et d'une valeur marchande de \$903,000 par comparaison à un peu plus de \$1,400,000. Les pêches de sandre ou doré et de tullipi, prédominantes

au Manitoba, mais non sans importance dans les deux autres provinces, ne furent pas, dans l'ensemble, aussi fructueuses que l'année antérieure. Les prises de sandre ou doré et de tullipi en Saskatchewan furent quelque peu plus considérables qu'en 1929 mais moindres au Manitoba et en Alberta, même qu'au Manitoba le décroissement en fut prononcé. Les prises et la valeur du brochet déclinèrent dans chacune des trois provinces.

Dans le territoire du Youkon, la valeur des pêches fut en 1930 de \$29,510, soit un gain tant soit peu supérieur à \$4,700. La pêche des corégones s'y est caractérisée par une augmentation tant en production qu'en valeur. Au Youkon, les exploitations de pêche ne sont pas exercées avec une grande intensité.

La tabulation statistique, dressée par le ministère fédéral des Pêcheries et l'Office fédéral de la Statistique, tend à révéler un déclin tant dans le montant des placements monétaires affectés en 1930 à l'industrie des pêches des provinces centrales et du Youkon que dans le nombre des personnes qui s'y sont consacrées à l'exercice de cette exploitation. Au Manitoba, le nombre des pêcheurs surpassa de cent celui de 1929 cependant qu'au Youkon il n'y eut qu'une légère diminution, mais il en fut autrement en Saskatchewan et en Alberta où le fléchissement du nombre des exploitants fut marqué. Il s'ensuit que le personnel pêcheur qui était de 7,522 individus en 1929 tomba à 6,949 en 1930.

Au Youkon, le chiffre des placements monétaires s'accrut de plusieurs milliers de dollars; mais pour accuser un déclin de quelque \$7,500 au Manitoba un déclin à peu près équivalent en Alberta, et un fléchissement de plus de \$34,000 en Saskatchewan. Pour l'année sous revue le chiffre des placements monétaires se décompose comme suit:—

Manitoba. . . . .	\$1,309,141
Saskatchewan. . . . .	87,313
Alberta. . . . .	539,767
Youkon. . . . .	16,220

### CANALISATION—Suite

tion terminée, on soulève la vanne fermant l'issue du parc et les poissons choisis pénètrent dans le canal. Les autres reproducteurs sont dirigés vers le réservoir ou bassin de l'usine en amont de l'échelle et du canal et poursuivent d'eux-mêmes leur ascension de la rivière.

## PRISES DE POISSON DE MER

—Suite

vres et à \$471,659 en mai 1930. On signale un gain dans les prises et la valeur de la morue et de l'aloise. Presque toutes les autres pêches, toutefois, accusent un fléchissement. Les pêches de homard et de sardines, toutes deux importantes au Nouveau-Brunswick, accusent un déclin prononcé par rapport à mai 1930.

En l'île du Prince-Edouard, les prises de homard se sont totalisées à 4,242,000 livres, résultat quelque peu plus élevé qu'en mai antérieur, mais, au chiffre de \$194,165, leur valeur au débarquement subit une diminution de \$60,000. Les autres exploitations furent moins fructueuses que l'année dernière. Dans l'ensemble, les prises se chiffrèrent en mai à 6,992,000 livres d'une valeur au débarquement de \$221,835 par comparaison à 8,095,400 livres d'une valeur au débarquement de \$295,966 en mai 1930.

En mai, les prises de poisson en Québec se montèrent à 13,555,600 livres, soit un fléchissement de quelque 3,383,000 livres. Leur valeur au débarquement fut de \$94,015, soit environ \$56,000 au-dessous du total de 1930. La morue donna lieu à un relèvement tant dans les prises que dans la valeur de ces dernières au débarquement, contrairement au hareng et au homard dont les prises et la valeur déclinèrent.

## MISE EN SERVICE DE NOUVEAUX BATEAUX GARDE-PÊCHE

Quatre nouveaux bateaux garde-pêche furent mis en service en juin par le ministère fédéral des Pêcheries, dans les eaux de la Colombie britannique. Ces quatre unités, actionnées par des moteurs-types diesel et dotées d'une vitesse de neuf nœuds, se sont jusqu'ici révélées aptes à tenir la mer avec régularité et sécurité.

Un de ces bateaux, le "Merrysea 2", remplace une ancienne unité de la même dénomination dans le passage Howe, avec Vancouver pour port d'attache ou d'armement. Le "Black Raven 2", dont le prédécesseur était devenu impropre au service, a été affecté à la police des pêcheries dans la baie Albert, tandis que le "Onerka 2" est présentement en activité en l'Archipel de la Reine-Charlotte. Le quatrième bateau, le "Egret Plume 2", a comme base d'opération la côte occidentale de l'Archipel de la Reine-Charlotte.

## DE L'INDUSTRIE DES PÊCHES EN TROIS PROVINCES

En 1930, plus de 19,400 personnes trouvèrent de l'occupation dans l'exercice de l'industrie des pêches de la Colombie britannique. Dans cette même province, les navires, barques, filets, engins, appareils, usines, fabriques, ateliers et objets divers de matériel d'exploitation, utilisés par les exploitants, représentèrent en cette période un placement monétaire de près de \$34,944,000.

Ce sont là deux des faits saillants du rapport statistique préliminaire de 1930, propre aux pêches de la Colombie britannique, rapport qui est rédigé conjointement par le ministère fédéral des Pêcheries et l'Office fédéral de la Statistique.

Il ne semble pas hors de propos de fournir ici un résumé succinct de certains autres faits relatifs aux exploitations de pêche exercées en 1930 sur la côte occidentale aussi bien que des résultats de la pêche pratiquée en Québec et au Nouveau-Brunswick en cette même année.

### *Colombie britannique*

Les produits de pêche de la Colombie britannique comportèrent en 1930 une valeur marchande totale supérieure à \$23,103,000. La pêche du saumon rendit compte d'environ \$16,611,000 de ce total. Plus de 2,221,000 caisses de conserves de saumon furent préparées, ce qui est la plus importante production de conserves jamais enregistrée dans les annales de pêche de la province. Soixante-trois fabriques de conserves, dont 60 de saumon, 47 ateliers de salage du poisson, 18 fabriques d'engrais, d'huiles ou de farines furent mis en exploitation. La pêche du flétan fut évaluée à environ \$2,447,000 sur le marché. Plus de 80,000,000 de livres de hareng salé au sel sec furent préparées pour l'exportation en Orient en grande partie. La fabrication de la farine de célan s'est montée à 18,934 tonnes et celle de l'huile de célan à un peu plus de 3,204,000 gallons. Environ 21,100 caisses de conserves de maîtres, myes, couteaux, praires furent préparées, aussi bien que 295 caisses de conserves de crabes. Il fut capturé 320 baleines qui donnèrent, entre autres produits, plus de 525,000 gallons d'huile.

### *Québec*

En Québec, les pêcheries maritimes fournirent un rendement en poisson et

produits de poisson d'une valeur marchande de \$1,976,800, en chiffres bruts, et les pêcheries fluviales et lacustres un autre rendement évalué à \$526,000. En cette province, les placements monétaires affectés à l'exercice de l'industrie des pêches furent évalués à \$2,903,800. Le nombre de personnes qui y trouvèrent de l'occupation fut de 12,233, soit 1,167 de plus que l'année antérieure. Les prises de l'année comportèrent une valeur au débarquement de près de \$2,200,000. Un accroissement de près de 714,000 livres fut enregistré dans la pêche du saumon dont les prises totalisées à 1,720,000 livres, constituèrent un des traits caractéristiques des exploitations de l'année. Environ 28,660 gallons d'huile de foie de morue médicinale et plus de 50,000 gallons d'huile de morue furent produits. De toutes les pêches fluviales et lacustres, c'est celle de l'anguille qui tient le premier rang en rendement pécuniaire. Plus de 1,273,000 livres de ce poisson furent écoulées sur le marché, d'une valeur marchande supérieure à \$116,000.

### *Nouveau-Brunswick*

Au Nouveau-Brunswick, on compte 14,282 personnes d'employées dans l'exercice de l'industrie poissonnière. Leurs exploitations se sont traduites par une production évaluée à \$4,853,527. Les placements monétaires affectés à la pratique de l'industrie se sont totalisés à un peu plus de \$5,902,000. La pêche des homards, une des plus importantes exploitations poissonnières du Nouveau-Brunswick, a produit des prises estimées à plus de 9,000,000 de livres, soit un accroissement substantiel par rapport à 1929. Mais l'avalissement des cours, pratiqués pour ce crustacé, amena un déclin sensible dans le rendement pécuniaire de cette pêche. La pêche de la sardine, une autre importante exploitation, fut moins productive que l'année d'avant. Le rendement en conserves de la sardine fut de 244,328 caisses contre 329,204 caisses en 1929. La province du Nouveau-Brunswick est la plus forte productrice de conserves de myes ou clanques et de praires de tout le Canada. La mise en conserve de ces mollusques s'y est élevée en 1930 à 16,412 caisses d'une valeur marchande de \$83,500. La production de l'huile de foie de morue médicinale s'est chiffrée à 15,410 gallons et la production de l'huile de morue à 26,775 gallons. Près de 23,000 gallons de colle de poisson figurent cette année dans la colonne des sous-produits de pêche.

### *DES AVANTAGES—Suite*

trop désuets. Le ministère résolut donc de construire deux bateaux d'expérimentations et d'essais appliqués à la pêche et de les mettre en service dans les eaux de l'Île du Prince-Edouard. La conduite de chacun de ces bateaux fut confiée à un pêcheur expérimenté de la Nouvelle-Ecosse, versé dans la connaissance des opérations de boitage, de mouillage et de relèvement des palangres. Des pêcheurs locaux montèrent à bord de ces bateaux afin de se perfectionner dans l'exercice de ces diverses manœuvres. En 1930, on parvint à localiser des fonds de pêche à la morue de tout premier ordre à hauteur de l'extrémité orientale de l'île. Les opérations, accomplies par ces deux unités, ont servi à démontrer la possibilité de réaliser des prises de morue de qualité supérieure par l'introduction de procédés de pêche modernisés. En la saison de 1931, les bateaux n'opéreront qu'en vue de préciser les quantités de poisson qu'ils sont susceptibles de réaliser.

Deux opérateurs d'expérience dans l'application du procédé de séchage de la morue dit "procédé de Gaspé" ont été employés par le département en vue d'en diffuser la connaissance parmi les pêcheurs du Nouveau-Brunswick septentrional et des Îles-de-la-Madeleine. Un de ces agents fut affecté au comté de Gloucester avec mission d'instruire individuellement les pêcheurs en montant avec eux sur les bateaux côtiers. Son travail s'est traduit par une amélioration sensible dans les procédés de traitement de la morue. Il s'est livré à ce travail avec un égal succès l'année dernière, aux Îles-de-la-Madeleine où il est présentement encore en train de l'exercer.

Le deuxième expert fut employé l'année dernière dans l'arrondissement de Hardwicke, du comté de Northumberland, N.-B.

Bien qu'il existe de productifs fonds de pêche à la morue dans le voisinage de cette région, la pêche et la préparation commerciale de ce poisson n'y avaient jamais été pratiquées dans une large mesure. Les efforts de notre moniteur s'y sont traduits là aussi par la multiplication des armements de pêche à la morue et des opérations de séchage de ce poisson. La campagne d'enseignements professionnels va être poursuivie cette année dans la région de Hardwicke.

# FISHERIES NEWS BULLETIN

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Hon. EDGAR N. RHODES, M.P. Ottawa, Canada

Deputy Minister:  
W. A. FOUND

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## SEEK TO EVOLVE GAMIER GAME FISH THROUGH FISH CULTURE EXPERIMENTS

### Cross-Breeding of Brown Trout and Atlantic Salmon by Dominion Department Gets Some Interesting Results, with Other Crosses Now Being Tried

Having in view the production of improved types of certain sport fish, the Fish Culture Division of the Dominion Department of Fisheries is carrying on interesting experiments in cross-breeding and already some promising results have been obtained in the development of hybrid Brown trout.

Hybrids developed by crossing Brown trout and Atlantic salmon have shown greater growth than Brown trout of like age, and it is expected that the crosses will show somewhat increased gameness and that perhaps other improvements in type may also be manifested.

The work of the Fish Culture Division is largely devoted to the maintenance of the commercial stocks of such fish as salmon, whitefish, and pickerel, but the angling resources of the Dominion are so important, from the tourist and recreational standpoints, that the division also gives considerable attention each year to sport fish propagation and the stocking of angling waters. It is as part of this phase of its work that the experiments in connection with hybrid trout has been undertaken.

#### *What's Been Done*

The major experiments in cross-breeding in the past few years have been going on at the department's fish hatchery near Saint John, N.B., though some experimentation has been undertaken at other points.

At present the experiment at Saint John in hybrid Brown trout development is being continued so as to create a fish with seven-eighths Brown trout strain and one-eighth Atlantic salmon strain, and a further experiment is being made with crosses of Landlocked salmon (*Salmo salar sebago*) and Atlantic salmon (*Salmo salar*). The crossing of Brown trout and salmon was begun in the autumn of 1925 but the cross-breeding of Landlocked and Atlantic salmon

did not begin until last year. When the experiments have been completed, and it is possible to judge of their success with reasonable certainty, the hybrids will be introduced into various waters if it seems that they would be useful additions to the country's types of fish.

In November, 1925, a cross was made between a female Brown trout and a male Atlantic salmon. The fertilized eggs were placed in the Saint John hatchery and in April, 1926, a thousand fry were hatched. When the fry had reached the fingerling stage they were put in a hatchery pond and there they spawned in the autumn of 1929. Further crosses were then made between hybrid females and pedigreed Brown trout males and between pedigreed females and hybrid males, and fry were hatched in April, 1930. This year, as has been said, the crossing is being carried a step farther.

So far as the hybrids already produced are concerned, the superintendent of the hatchery has reported that in looks they resemble Brown trout, but in habits they are more like Atlantic salmon. At four and a half years old they were considerably larger than Brown trout of like age.

#### *Crossing Salmon*

Landlocked salmon occur in several waters in the southern part of New Brunswick, but they are not regarded so highly by sportsmen as other varieties of salmon. They are not so attractive in the quality of their flesh and they are less gamy than some other sport fish. It was such considerations as these which led the fish culturists to undertake the crossing of Landlocked and Atlantic salmon in the hope that by cross-breeding it might be possible to evolve an improved type.

(Continued on page 2)

## LOBSTER CATCH FOR HALF YEAR INCREASES

### Total Landings More than 35,500,000 Pounds Official Reports Show

Canada's landings of lobsters in the period since the opening of the late autumn season of 1930 and the end of June again showed an increase, as compared with the total catch for the previous corresponding period.

All told, the catch amounted to 35,503,500 pounds or some 617,000 pounds more than the catch in the like period of 1929-30, which, in turn, was more than 2,500,000 pounds greater than the quantity landed a year previously. The lobster industry, like other industries everywhere, is being affected adversely by unfavourable world economic conditions but the continued productiveness of the fishery is a reason for satisfaction as indicating that the lobster resources are being maintained.

So far as the month of June is concerned, there was very substantial gain in lobster catch, which reached a total of more than 11,202,000 pounds, according to unrevised statistics compiled by the Dominion Department of Fisheries. Unfavourable market conditions, however pulled down the landed value of the catch for the month to \$612,381, a decrease of \$88,700 from the figures for June, 1930.

There were larger landings in June in all three of the Maritime Provinces than were made in June of last year, but the Quebec lobstermen were not so fortunate and landed only 1,072,000 pounds, in round figures, or a half million pounds less than they caught in the 1930 month. The Nova Scotia catch was 4,915,000 pounds, a gain of some 33,000 pounds. In Prince Edward Island the landings were 3,086,500 pounds, or about 592,000 pounds more than a year ago. New Brunswick fishermen accounted for nearly 2,119,000 as compared with only 1,436,100 pounds in June, 1930. Landed value showed some increase in both New Brunswick and Prince Edward Island but a decrease in Nova Scotia.

## SEA FISH CATCH FOR HALF YEAR BIGGER THAN TOTAL FOR LIKE PERIOD OF 1930

Canada's landings of sea fish in the first six months of 1931 were larger by some 767,000 pounds than in the corresponding period of 1930, amounting in all to 303,351,800 pounds as compared with 302,584,300 pounds. So far as the landed value of the catch is concerned, however, the 1931 figures show sharp decline, a state of affairs which will surprise nobody, in view of the world's depressed economic conditions. In the first half of 1930 the landed value of the sea fish catch to the fishermen totalled approximately \$9,501,000; for the six months ending with June of this year the figures were a little less than \$6,413,000.

The statement showing the catch and landed value for January-June, 1931, as made up from unrevised returns to the Dominion Department of Fisheries, is as follows:—

Province	Catch lbs.	Landed Value \$
Nova Scotia.. . . . .	107,368,300	3,059,654
British Columbia.. . . . .	100,663,200	1,572,661
New Brunswick.. . . . .	48,322,700	908,618
Quebec.. . . . .	32,632,900	434,698
Prince Edward Island.. . . . .	14,214,700	437,264
	<b>303,351,800</b>	<b>\$6,412,895</b>

Landed value decreases in each of the provinces, as compared with the value figures for January-June, 1930, but so far as catch is concerned there was an increase of more than 3,000,000 pounds in the case of British Columbia and of more than 6,000,000 pounds in the case of Quebec, while the Prince Edward Island landings were 100,000 pounds and more above the 1930 total for the province. New Brunswick catch returns show a drop of about 1,800,000 pounds and the landings in Nova Scotia were some 7,000,000 pounds smaller than a year ago.

Landings of cod, haddock, hake and cusk, halibut, mackerel, sardines, alewives, salmon, clams, oysters, and scallops were all smaller in January-June of this year than in the 1930 period. The increased landings, so far as the principal varieties of sea fish are concerned, were in pollock, herring, smelts, and lobsters. The lobster catch totalled 34,936,000 pounds as against 34,286,700 pounds.

### SEEK TO EVOLVE (Cont.)

The experiment was begun at Saint John last November when Landlocked females were crossed with male Atlantic salmon and Atlantic females with Landlocked males. The fry hatched out during the spring but it is too early as yet, of course, for an opinion to be formed as to what measure of success the experiment will have.

## FISH CULTURE WIDENS ANGLING RESOURCES

Following action by the Dominion Department of Fisheries, through its Fish Culture Division, in planting fry in various Alberta waters several years ago, anglers are now landing Rainbow, Loch Leven, and Brown trout in districts in the provinces where these fine sport fish were formerly unknown. It is another of the numerous Canadian cases in which Dominion fish cultural work has meant an enlargement of fisheries resources.

Fishing in Dog Pound Creek, a tributary of the Red River, several weeks ago, a Calgary man landed a gamey Loch Leven trout measuring about a foot in length, and he and a companion also caught a dozen good-sized Brown trout. Several Loch Leven trout were also taken by other anglers about the same time. Another report reaching the department at Ottawa told of Rainbow trout being numerous in Old Man River and running to more than four pounds in weight. Previous to steps which the department took to stock these areas with these varieties of trout the fish were unknown in that part of the country.

Fish canning and curing plants in operation in British Columbia last year represented an investment of over \$21,636,000. Sixty salmon canneries accounted for about \$15,360,000 of this total.

## GUARD WALRUS HERDS AGAINST DEPLETION

### New Regulations to Conserve Big Marine Mammals of Canada's North

Guarding against depletion of the walrus herds in Canada's northern waters the Dominion has recently laid down new regulations to protect these huge marine mammals.

Everything from sardines and smelts to walrus and whales are taken in the Canadian fisheries and authority must always be vigilant to prevent the country's marine wealth from being lessened unduly by too intensive fishing or, in the case of the walrus, too intensive hunting. For some time past officials of the Dominion Department of Fisheries in consultation with officers of the Northwest Territories Branch of the Department of the Interior, and officers of the Royal Canadian Mounted Police, who are especially well qualified to give advise in this connection, have been looking into the situation as regards the walrus herds. It was found that new regulations were desirable, to replace those hitherto in effect, and they have now been approved by the Governor General in Council. In brief, they provide that no one shall kill any walrus except for use as food for himself or his dependents or for his dog teams, and that no Eskimo or half-breed with dependents shall kill more than seven walrus in any year and no Eskimo or half-breed without dependents, and no person of the white race, more than four. Persons other than Eskimos or half-breeds must obtain licences issued under the authority of the Minister of Fisheries before hunting walrus, and not more than two licences will be issued to representatives of any company at any one station or post. All hunters are required to make report to officers of the R.C.M.P. each year as to the number of walrus killed, their approximate weight, sex, etc. The regulations also prohibit the export from the north of any walrus tusks that have not been already carved or otherwise worked up for sale in a retail way, as well as the export of the hides for commercial purposes.

### Are Big Fellows

Walrus grow to be big chaps. They may weigh from 1,500 to 4,000 pounds. One which was examined by the naturalist of the Department of Fisheries

(Continued on page 4)

## WIDE FIELD OF FISHERIES RESEARCH IS COVERED BY DOMINION SCIENTISTS

**Continuous Programme of Investigation and Experiment Carried on under Biological Board of Canada with Many Questions Studied during Past Year**

Canned shrimps have not hitherto been packed in Canada and when some British Columbia men undertook canning operations last year they found difficulty in preventing blackening and putrefaction of the product.

They turned to the Pacific Fisheries Experimental Station at Prince Rupert for advice, and it wasn't very long before one of the station staff put his finger on the major cause of trouble.

This is only one of a good many cases in which scientific workers employed under the Biological Board of Canada have helped to solve problems which the fishing industry has met and have assisted Canadian fisheries interests to improve the methods of handling and processing fish. A program of investigation and experimentation in the interests of fisheries development is carried on continuously under the auspices of the board, which operates under the control of the Dominion Minister of Fisheries. Work is done on both coasts and, to some extent, in certain inland areas. It covers both questions of fish life and practical problems of the fishing industry. Field work is done, as well as research, at the four stations which the board maintains—a fisheries biological station at St. Andrew's, N.B., a similar station at Nanaimo, B.C., and fisheries experimental stations at Halifax, N.S., and Prince Rupert, respectively. A permanent staff of scientists is employed, though not a large number, and others are engaged from time to time for work upon special problems.

### *Covered Wide Range*

A great deal of study and experimentation was in progress under the board in 1930. A complete summary of what was being done during the year would run into much space, but a glance may be taken here and there.

An effective method of preventing the discolouration of halibut was worked out by Pacific coast investigators. Studies of fish glues were carried to the point where it was established that, when prepared by electro-dialysis, they are equal to the best commercial glues both in strength and in moisture resistance. Other studies showed the beneficial results to be obtained by more frequent

sterilization of particular parts of salmon cannery equipment. Experiments were undertaken looking to the development of a satisfactory method of preparing lubricating oil from dogfish oil. Oyster investigations were carried on in the Maritime Provinces (principally in the Malpeque Bay area of Prince Edward Island), and in Boundary Bay and Ladysmith harbour in British Columbia, where, by the way, there are now three species of oysters—Native, Imported Eastern, and Imported Japanese. Study of the pilchard and herring runs in British Columbia waters was continued with a view to determining the probabilities as to future supplies of these varieties of fish, which are very important in the Dominion's Pacific coast fisheries. Salmon research was continued on both coasts, and some interesting and valuable facts were established. Further study of the chemistry of wood smoke, as used in preparing smoked fish, was pursued. Various questions in connection with the maintenance of quality in canned lobster production were the subject of investigations and experiments. Further observation of the effect of variations of temperature on the preservation of fish in cold storage was made. Experimental canning of rapid-frozen mackerel was undertaken to prepare the way for production of this kind on a commercial scale. Studies on the propagation of brook trout were continued. The distribution and migrations of cod in the Straits of Belle Isle, and their relation to water temperature, were studied, as were the distribution and migrations of the herring in the Bay of Fundy. Experiments were conducted on the artificial "fertilization" of more or less sterile waters with organic matter. Lobster tagging was carried on, to some extent, with a view to obtaining information as to the extent and direction of lobster migrations.

Organized salmon trollers of the Kyuquot area, British Columbia, have recently taken out incorporation under the British Columbia Co-operative Associations Act. The association handles the fish taken by its members and also conducts a general store.

## PACIFIC COAST PACKS LESS CANNED SALMON

**Early Season's Drop Below Heavy Output in Like 1930 Period not Surprising**

British Columbia canners have been putting up less canned salmon than they packed in the early part of 1930, the year of record production, but their output up to July 11 was slightly above 100,000 cases. In 1930 the output up to July 12 was 137,953 cases.

Last year the runs of salmon to British Columbia waters were exceptionally large and such an abundance of fish would scarcely be expected this season. In view of this fact, and the very unsatisfactory conditions prevailing in world markets, which do not encourage big production, there is nothing at all surprising in the decrease in output so far this year.

The pack processed up to July 11 included 76,073 cases of sockeye, 7,960 cases of springs, 12,372 cases of bluebacks, 2,748 cases of cohoes, and over 800 cases of steelheads, chums and pinks. There were declines all round, as compared with the production up to a corresponding date in 1930, but last year, it must be kept in mind, was an exceptional year in the salmon fishery.

## EXPORT MARKETS TAKE CANADIAN FISH ROE

Preparation of salmon roe for sale in eastern countries is one of the operations carried on each year in the British Columbia fishing industry, though ordinarily not on a very extensive scale. Some sturgeon roe is also put on the market each year from Canadian fisheries. The chief production is in Ontario.

Opportunity to enlarge the trade in salmon roe is indicated in a recent report by the Canadian Government Trade Commissioner at Cairo to the effect that it should be possible "to market British Columbia light-salted salmon eggs" in Egypt in the latter months of the year.

Quebec fishermen used 3,125 gasoline boats in the year 1930, or over 100 more than they operated in 1929. The boats had a value of \$969,710.

## QUEBEC, PRINCE EDWARD ISLAND LAND MORE FISH, OTHER CATCHES SMALLER

### Total June Landings of Sea Fish for Dominion Show Decrease with Adverse World Conditions Operating to Lessen Value of Catch

Canadian landings of sea fish in June, as shown by unrevised returns to the Dominion Department of Fisheries, amounted to 68,210,000 pounds, or some 17,000,000 pounds less than in June, 1930, while the catch had a landed value of \$1,856,425 as compared with \$3,069,000, in round figures, a year ago.

The landings for the month decreased on both coasts, though the greater decrease was in the Atlantic areas. The unrevised catch and landed value figures for the two coasts, with comparative statistics for June, 1930, are as follows:

<i>Pacific Coast</i>		
	June, 1931	June, 1930
Catch, lbs. . . . .	8,403,500	11,051,600
Landed value. . . . .	\$ 379,368	\$ 913,665
<i>Atlantic Coast</i>		
Catch, lbs. . . . .	59,806,200	74,199,200
Landed value. . . . .	\$ 1,477,055	\$ 2,155,622

Quebec and Prince Edward Island both showed increased landings in June, though the Prince Edward Island gain was not great, but the Nova Scotia catch fell off very substantially and the New Brunswick fishermen were not quite as successful as in the previous June. Landed value dropped in all four provinces.

In Nova Scotia the catch amounted in all to approximately 30,120,000 pounds, with a landed value of \$654,675, as against a catch of 48,984,000 pounds and a landed value of \$1,141,870 a year ago. Landings of haddock (2,897,800 pounds), were less than half as large as the landings in June, 1930. That was true, too, of the catch of hake and cusk, while the cod catch was about 10,950,000 pounds as compared with a little more than 20,542,000 pounds in the 1930 month. There were also smaller fares of mackerel, alewives, and salmon. The pollock catch was practically the same in each year. On the other hand, landings of lobsters and halibut and shad showed increases.

#### *Where Gains Came*

Large increase in the catch of mackerel, and a substantial increase in herring catch, were the main factors in producing a net gain in Quebec landings for the month. More than 3,500,000 pounds of mackerel were taken by fishermen of the province, as compared with a little less than 1,500,000 pounds

in the previous June. The herring catch was 2,383,000 pounds as against 1,796,900 pounds. There was also a small gain in salmon landings, which amounted in all to 772,000 pounds. Lobster catch decreased. The total catch of all varieties of sea fish for Quebec for the month was 13,620,800 pounds, a gain of nearly 4,300,000 pounds. Total landed value, \$268,405, showed a drop of about \$79,000.

Prince Edward Island fishermen brought ashore about 5,163,500 pounds as compared with 4,887,000 pounds in June of last year. Landed value amounted to \$177,405, a decrease of a couple of thousand dollars. Gains in hake and cusk, herring, and lobster landings accounted for the increase in total catch.

#### *In New Brunswick*

In New Brunswick the herring landings for the month, 1,044,000 pounds, were more than four times as great as the quantity taken in the June before. Lobster catch increased by nearly 700,000 pounds. More cod were taken than a year ago, and slightly more haddock. The sardine catch, however, was only 4,214 barrels as compared with 7,603 barrels a year ago. The salmon catch was 1,696,700 pounds, or some 200,000 pounds less than in June, 1930. Alewives were taken in much smaller quantities than last year, and there was a decrease in clam and quahaug production. Altogether slightly more than 10,902,000 pounds of sea fish were taken in the province during the month as compared with 10,966,500 pounds in 1930. Landed value to the fishermen was \$376,570, a decrease of nearly \$110,000.

#### *British Columbia Results*

British Columbia's herring takings showed an increase in June, but the landings in virtually all the other fisheries dropped. In the case of halibut, however, the catch of 2,828,300 pounds showed only a comparatively small decrease.

The quantity of salmon landed was approximately 3,104,000 pounds, a decrease of about 2,400,000 pounds.

## BE SURE CAMP FIRES ARE OUT

Carelessness by campers—perhaps they were anglers—recently jeopardized New Brunswick woods, but thanks to the alertness of a Dominion fisheries inspector the forest fires that might have done much damage were put out before they had spread far. Twice in one day the inspector found forest fires burning which campers had started, presumably through carelessness. In each case the officer mustered help and the fires were put out. Watchfulness by a fisheries officer thus averted what might have been very serious consequences from campers' carelessness in abandoning camp fires without first making sure that the sparks had all been put out. Anglers and other outing parties going into the Canadian woods should remember that it's not enough to think the camp fire is out. Be sure it's out. Be sure, too, that burning matches aren't dropped carelessly, or lighted cigar or cigarette butts or pipe ashes.

#### **GUARD WALRUS HERDS (Cont.)**

some years ago measured 11 feet 7 inches to the end of its hind flipper, which, itself, was 2 feet 6 inches across. These mammals are a major source of food for the Eskimos themselves and for the dog teams which are so important a part of Eskimo equipment.

Prior to the time when firearms became available to the natives they did their walrus hunting with spears and harpoons. It was difficult and hazardous. When the rifles came, however, it became comparatively easy for the Eskimo to kill walrus in numbers. The hunter was aided in slaughter by the fact that it is the tendency of the walrus to remain at bay until it can see its enemy, so that as long as the hunter can remain hidden he has no difficulty in killing off one walrus after another when they are gathered together. The Eskimo, moreover, is apt to kill more than he actually needs, if opportunity presents itself.

The net result of a number of conditions has been that since the beginning of this century the walrus herds, especially in Hudson Bay and Hudson Strait waters, have been much depleted, notwithstanding efforts by northern officers of the Mounted Police and the Department of the Interior to educate the natives as to the un wisdom of killing beyond their needs. The new regulations are expected to result in checking depletion.

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## CANADA'S ATLANTIC COAST SCENE OF WORLD'S GREATEST LOBSTER FISHERY

### Catch of More Than 40,700,000 Pounds Made in 1930 with Fishery Second Only to Salmon Industry in Point of Value of Marketed Return

Year after year hundreds of fishermen in Canada's Atlantic coast provinces carry on the world's greatest lobster fishery.

Lobsters are also caught off Newfoundland, in some of the Atlantic waters of the United States, and in certain European areas but, as Dr. D. K. Tressler, a United States authority, has pointed out, "the scale of the business is very much greater in Canada than anywhere else in the world."

Last year the Dominion's lobster fishery yielded a catch of over 40,726,000 pounds and was second only to the salmon fishery in point of marketed return—\$5,215,000.

Nova Scotia is the largest producer of lobsters, and accounted for approximately 20,820,000 pounds of the Dominion's 1930 catch. In New Brunswick the year's catch was slightly more than 9,000,000 pounds while the Prince Edward Island and Quebec landings amounted to about 8,100,000 pounds and 2,768,000 pounds, respectively.

#### The Lobster Itself

The lobster found in North American waters is known scientifically as *Homarus americanus*, as distinguished from *Homarus gammarus*, its European brother. Normally, adult lobsters are dark green in colour when taken from the sea but when they are boiled the shell colouring is transformed into red.

"The sea bottom is the natural abode of the adult lobster, the source of its food, and the scene of all its activities. It never forsakes the water or leaves the bottom of its own accord. Lobsters wander close to the shore and out to depths of over 100 fathoms in search of prey. In travelling over the bottom the lobster walks nimbly upon the tips of its slender legs; but when transferred from sea to land it can only crawl in vain attempts to walk. . . . In the water the lobster is agile, wary, pug-

nacious, capable of defending itself against its enemies, and sometimes moves at a high rate of speed. . . . The lobster is essentially a creature of nocturnal activity; it is generally far more active at night than by day. . . . Lobsters live chiefly on fish, alive or dead, and on the invertebrates which inhabit the bottom and come within their reach. They catch many small live fish and a few of the more sluggish larger fish. Adult as well as larval lobsters are cannibalistic."

#### Catching and Marketing

Lobsters are caught in "traps" or "pots" which the fishermen set on the sea bottom at suitable spots. Briefly described, the trap or pot, several feet long, is a device made of laths, with coarse netting at the ends. A funnel-shaped opening in the netting, narrowing inward, offers a means of entry for the lobster when it is attracted by bait placed within the trap. When the trap is pulled up by the fisherman the captured lobsters are removed through a small door.

A great part of the Canadian catch is put up in the canned form but of late years there has been increasing growth in the trade in live lobsters. In 1930, for instance, the shipments of live lobsters amounted to more than 12,500,000 pounds as compared with a little more than 11,000,000 pounds in 1929, slightly less than 9,800,000 pounds in 1928, and about 8,690,000 pounds in 1927. Most of the trade in live lobsters is export business with the United States and last year these export shipments were over 9,600,000 pounds.

The output of canned lobsters from the 333 lobster canneries in operation last year was 139,109 cases—substantially larger than the production in other recent years. A large part of the annual pack of canned lobsters is ex-

(Continued on page 2)

## FISH TAKE "ELEVATOR" TO SPAWNING GROUNDS

### Sockeye Salmon by Thousands Use Fishway at Turbulent B.C. Falls

Sockeye salmon by the thousand "took the elevator" in making their way to the spawning grounds in the upper portions of Stamp River, British Columbia, this summer, or, in other words, the fishway maintained by the Dominion Department of Fisheries at Stamp Falls enabled many salmon to make their way past a height of powerful, tumbling water which they might otherwise have been unable to surmount.

Between June 11 and July 13, for instance, no less than 8,568 sockeye were counted making the ascent up the fishway, or more than twice as many as were counted between the same dates last year. In each year the counting time covered 10 hours of each day, the count being made by one of the department's British Columbia officers. Last year, by the way, the "traffic" up the fishway showed a considerable increase over the previous year's figures.

Fishways have been constructed by the Department of Fisheries in different parts of the Dominion to assist various species of fish to overcome natural obstacles which hamper them in reaching their spawning grounds. Construction and maintenance of works of this kind is one of the ways in which the department helps to conserve the Dominion's stocks of fish by ensuring adequate seeding of the spawning areas from year to year. Without these fishways a good many fish might be unable to fight their way successfully to the spawning beds and future stocks of fish in those areas would be diminished.

All told, 698 canneries, curing establishments, and reduction plants were operated last year in connection with the Dominion's fishing industry. In dollars and cents investment they represented the tidy sum of nearly \$30,810,000.

## CLIMBS "FORBIDDEN PLATEAU" TO STOCK PACIFIC COAST LAKES WITH GAME FISH

### Ascending Mountain Sides Still Patched with Snow in Mid-Summer, Dominion Fisheries Officer Plants Kamloops Trout in Waters Far Above Sea Level to Build Up Angling Resources

Climbing five or six thousand feet above sea level to do the job, an inspector of the Dominion Department of Fisheries planted 200,000 trout eggs in lakes on the Forbidden Plateau of Vancouver Island this summer in the course of the department's work in maintaining and improving the fish stocks of the country.

And when he got up to some of the lakes he found that they still held ice and snow, even though the time was July. More snow was clinging to the mountain sides near by, some of it pinkish in colour, at that.

Adding a bit more variety to the party's experience was the appearance of a large bear and several cubs when the inspector and his helpers reached Amphitheatre Lake, one of the waters to be seeded. "A large black bear, with two cubs, stood on the edge of the lake when we arrived," says the inspector's report to the department, "but upon seeing us they retreated slowly up the side of the mountain."

In addition to planting Kamloops trout eggs in McPhee, Moat, Amphitheatre, and Sunrise lakes, the inspector while on the plateau also examined other waters which had been seeded by the department in 1929, and here he found trout of good size plentiful.

#### Indian Legend

Ancient Indian legend ascribes some sinister qualities to Forbidden Plateau, and hence its name, but the white man knows it as a wild but beautiful part of British Columbia, dotted with attractive lakes. Here, for several years past, the department has carried on part of its fish culture program, stocking the waters with eggs from one or other of the hatcheries which it maintains in the province, so that in this way the angling resources of the territory may be improved.

Inspector H. H. Beadnell, the officer who was in charge of the planting operations on the plateau in the July trip this year, set out with 200,000 Kamloops trout eggs obtained from the Penask hatchery. At Courtenay he and a companion started for the plateau, with Croteau's Camp as their first stopping place. Croteau's was only fifteen

miles distant, but the way lay over a very rough trail and although the trip was begun in the early morning it was not until six o'clock in the evening that the two men and their pack horses reached the camp.

"Large patches of snow still remained in the vicinity of the camp," Inspector Beadnell reports, "and the boxes of eggs were placed in holes which we made for that purpose in the snow banks."

Next day, with two more men added to the party, the inspector set off for McPhee Lake. "There was still ice and snow on the lake," but 10,000 of the eyed eggs were planted in the inlet creek. From McPhee the men then climbed a considerable distance over the snow to Moat Lake, where they planted 30,000 eggs. Passing Circle Lake on the way back to their temporary camp at McPhee the party found that "the snow was deep on the mountains on the south and west sides."

On the following day Amphitheatre Lake was seeded with 40,000 eggs and then the men climbed to Sunrise Lake, about three miles distant. "Sunrise lies at the base of Mount Albert Edward and is about 5,500 feet above sea level. Snow was deep in places, patches of it being a pink colour. Ice and snow covered three-quarters of the lake. The inlet is small and extremely rocky; stones had to be collected in order to make nests for the 10,000 eggs we planted there." Ending the distribution of eggs for this trip, plantings were made in the outlet of Bell Lake, the outlet of Battleship Lake, and Rolland Lake on the following day.

Bound back to Courtenay again the inspector examined McKenzie, Douglas, Pearse, and Panther lakes which had been seeded with Kamloops trout eggs two years before, and found fish plentiful and of good size. Trout which had apparently remained in the creeks, however, were "not anything like the size of those which could be seen rising in the lakes, due in all probability, to lower temperatures and far less feed."

Inspection was also made of such waters as Meadow Lake, Lake Beautiful, and Upper Lake Beautiful, which had been seeded in 1930, and small fish were seen to be numerous.

## STUDY CLAM GROWTH IN EASTERN AREAS

Studying the rate of growth among clams in different environments, C. L. Newcombe, attached to the station of the Biological Board of Canada at St. Andrews, N.B., has been carrying on research this summer in a number of Bay of Fundy areas. Part of the work consisted in planting clams at various places and following their rate of growth. Through study of this kind knowledge as to the conditions making for growth is obtained, as well as other information of value.

Clams are found in the waters of all four of Canada's Atlantic provinces—Nova Scotia, New Brunswick, Prince Edward Island, and Quebec—as well as in British Columbia areas. New Brunswick is the biggest producer, with British Columbia coming second. Clams are a tasty food and large quantities are marketed yearly in the canned form.

## FISH ASSOCIATION MEETS IN SEPTEMBER

Members of the Canadian Fisheries Association will meet in Ottawa in annual convention on September 14 and 15, according to the official announcement from the association headquarters in Montreal. Last year the convention was held in Montreal, where the United States Fisheries Association also held its annual meeting at the same time. In 1929 the Canadian convention took place at Prince Rupert, B.C. It is expected by the association that this year's convention will be well attended and plans for an attractive and informative program are in hand.

#### CANADA'S ATLANTIC COAST

(Continued from page 1)

ported to the United Kingdom and other European countries and to the United States.

Other products of the lobster fishery, in addition to canned and live lobsters, are lobster meat and tomalley or paste, but the business done in them is relatively small.

Canada's lobster catch in the past five years (1926-1930) has averaged nearly 35,179,000 pounds a year, an increase of about 134,000 pounds over the average for the preceding five years.

## FISHERIES OF DOMINION SOURCE OF MANY BY-PRODUCTS OF VARIED USES

### Base for Household Shortenings, Medicinal Oil, Meal for Stock and Poultry Food, Fish Glue, Pearl Essence, and Oils for Many Commercial Uses among Products of Reduction Plants

Notwithstanding that only 10 pilchard reduction plants are operating in British Columbia this year as compared with 12 in 1930 and 21 in 1929, the output of pilchard meal and oil up to August 1 was much in excess of the production at the same date of last year and, so far as meal is concerned, there was gain over the figures at the like date of 1929, which was a year of large output.

This year very large quantities of pilchards have been available off the west coast of Vancouver Island, and not only have the fish been abundant but they have run closer to shore than in any of the three preceding seasons. So far, however, their oil content has not been as great as had been hoped, but the condition as to oil ordinarily improves as the season advances.

Production from the pilchard meal and oil plants up to August 1 in each of the years 1931, 1930 and 1929, is shown in the following short table:—

	1931	1930	1929
Meal ..	4,005 tons	712 tons	3,559 tons
Oil.....	378,197 gals.	77,702 gals.	472,481 gals.

Pilchards occur in British Columbia waters only, so far as Canadian areas are concerned, but numbers of other fish are also used in reduction plants on both Canadian coasts so that by-products operations have come to have important place in connection with the Dominion's fishing industry in recent years. Indeed, the expansion in manufacture of by-products has been a notable feature of fisheries development. Market conditions of late have been unfavourable, and prices depressed, but, nevertheless, the oil, meal, glue, fertilizer, and herring scales obtained from fisheries by-product operations in 1930 had a value on the market of more than \$2,365,000. Fish oil (the term including whale and seal oil), is used for a variety of commercial purposes while fish meal is an excellent food for cattle and swine and poultry. Pilchard oil is used elsewhere in the manufacture of high grade

shortenings and steps are now being taken looking to its use for this purpose in Canada.

#### Where Plants Operate

Fisheries by-product manufacture is carried on both east and west in Canada but operations in British Columbia are on a larger scale than those along the Atlantic coast. The pilchard fishery is the major source of raw material for the Pacific coast reduction plants but herring, grayfish (or dogfish), whales, and certain fish wastes are also sources of supply. Last year British Columbia's total production of pilchard oil was something more than 3,200,000 gallons and the output of pilchard meal was 18,934 tons. The 320 whales taken by British Columbia whalers during the year yielded over 525,000 gallons of oil, as well as nearly 1,200 tons of meal and fertilizer.

Production of medicinal cod liver oil, rich in health-giving properties, is an important branch of by-product operations on the Atlantic coast, although the oil is shipped elsewhere to undergo the final processes of refining. Last year the Canadian output of medicinal cod oil fell off somewhat, but in the three-year period, 1928-1930, there was an average production of a little more than 100,000 gallons. Nova Scotia accounted for 40,526 gallons of the 1930 output, Quebec for 28,660 gallons and New Brunswick for 15,410 gallons.

In addition to medicinal cod liver oil the Atlantic provinces also produce cod oil, herring oil and meal and scales, some hair seal oil, a little porpoise oil, fish glue, and meal and oil made from grayfish and fish waste, as well, of course, as a considerable quantity of fish fertilizer. There is also some production of poultry grit from shells.

One of the interesting operations is the utilization of herring scales to obtain an essence for the manufacture of artificial pearls, but it is on a comparatively small scale and New Brunswick is the only one of the provinces in which it is undertaken. Fish glue, formerly produced only in Nova Scotia, is now manufactured in New Brunswick also and the output there in 1930 was nearly

(Continued on page 4)

## CANADA'S FISH WEEK IN MID-SEPTEMBER

Announcement has been made by the Canadian Fisheries Association that September 14 has been chosen as the opening date for "Canada's Fish Week" for 1931, and September 19 as the closing day. "Fish Week" is arranged for each year by the association, after consultation with fisheries interests as to the most suitable dates, and serves to emphasize both the importance of the Dominion's fishing industry and the exceptional value of fish as food. Observance is Canada-wide so that all over the country public attention is directed to fish foods and the nation's extensive fisheries resources.

## HUNT SEA LIONS TO PROTECT B.C. SALMON

Carrying out the annual hunt for sea lions, which do much harm in the British Columbia salmon fishery, the fisheries vessel *Givenchy* accounted for 1,357 lions on this summer's cruise to the rookeries at the Virgin and Pearl Rocks. In 1930 the number of lions killed was 1,068. The purpose of these yearly hunts is not the extermination of the sea lion herds but their control so that the injury done the salmon fishery may not become too great.

At the Virgins 1,286 lions were shot on the 1930 cruise and at Pearl Rocks, 71. Seven landings in all were made by men from the *Givenchy*. Other landings were prevented by fog and rough weather.

The official report of the cruise, which has been made to the Dominion Department of Fisheries, is to the effect that there was a dearth of yearling and two-year old lions. There were more lions on the Pearl Rocks than in 1930. At the commencement of this year's operations fewer lions than last year were seen on the Virgins, but there was a constant arrival of newcomers. Pearl Rocks lions were much wilder than those on the other rookery. In two instances members of the landing parties were charged by lions, but they escaped injury.

Fishermen and canners reported that the damage from sea lions in Rivers Inlet last year was the heaviest in recent years. They put the blame on large colonies of lions that infest the Haycock Islands.

## PACIFIC COAST MEN GET MORE FISH, JULY ATLANTIC CATCHES SHOW DROP

### Big Gain in Pilchard Landings in British Columbia Chief Feature of Last Month's Canadian Sea Fisheries Operations, with Mackerel Catch Higher in Eastern Waters

Atlantic coast sea fish catch in July was smaller than that of July, 1930, but there was increase in the Pacific coast landings, with the net result that the catch for the Dominion as a whole showed a gain of nearly 7,400,000 pounds, amounting in all to 117,903,000 pounds, as compared with approximately 110,525,000 pounds.

Since price levels are generally considerably lower than a year ago, however, last month's catch had a landed value only slightly more than half as great as the total for July, 1930, or \$2,132,425 as compared with \$4,158,095. Landed value showed decreases on both coasts.

The 1931 figures have been compiled from unrevised returns obtained by the Dominion Department of Fisheries and may be altered somewhat by revision.

Operations in all four of the Atlantic provinces were less productive in July than in the previous July. Taking the coast as a whole, 46,810,000 pounds of fish and shellfish were taken, with a landed value of \$697,555; in July, 1930, the catch was 53,583,900 pounds and landed value was \$1,075,844.

#### *In the Provinces*

Nova Scotia's landings for the month, 23,949,000 pounds, were smaller by about 1,145,000 pounds than last year. Landed value, \$332,530, showed a decrease of \$106,000, in round figures. In Prince Edward Island the catch was about 2,600,000 pounds, a drop of 988,000 pounds, and the landed value total was \$26,230 as compared with \$47,100 last year. New Brunswick fishermen brought ashore approximately 10,983,000 pounds, with a landed value of \$164,360, while in July, 1930, their catch was over 12,735,000 pounds with a landed value of \$254,960. The Quebec catch, totalling 9,279,000 pounds, showed a decrease of 2,888,000 pounds and had a landed value of \$174,435—a drop of over \$160,000.

In Nova Scotia the month saw decreased landings in all the principal fisheries, except the clam and mackerel fisheries. The mackerel fishermen made a catch almost four times as large as

that taken in July of last year, or more than 2,602,000 pounds as compared with only 661,600 pounds. Mackerel landed value for the month, \$29,335, was not very far short of being twice as large as the 1930 figure. The landings of clams and quahaugs was much larger than a year ago—3,326 barrels as compared with 617 barrels—and landed value also showed a very substantial increase and reached \$6,435.

Prince Edward Island mackerel and herring fishing operations were more successful than in the previous July, so far as size of total catches was concerned. The cod fishery and the hake and cusk fishery were less successful than last year.

In New Brunswick the cod landings were more than 4,000,000 pounds, an increase of 1,250,000 pounds. Hake and cusk catch also showed some gain and the mackerel catch for the month increased. Most of the other New Brunswick fisheries yielded smaller catches than in July, 1930. Sardine landings amounted to 6,507 barrels, a decrease of 5,900 barrels. The commercial salmon catch was something over 727,000 pounds, a 340,000 pound decrease.

Although there were increases in mackerel catch in all the other Atlantic provinces during the month, the Quebec landings of these fish were considerably smaller than a year ago. Landings of cod, herring, salmon and lobsters also dropped.

#### *On the Western Coast*

Greatly increased landings of pilchards explain the rise in British Columbia total catch for the month. Landings of salmon and halibut showed decreases, and so did the landings from other fisheries, but the pilchard catch was more than 41,500,000 pounds, while in July of last year only 7,234,000 pounds had been taken. Pilchard landed value increased from \$36,170 in the previous July to \$166,450.

The month's halibut catch was about 2,683,000 pounds, with a landed value of \$144,940; salmon figures were 25,310,000 pounds and \$1,098,290.

## SOCKEYE RUNS UP TO EXPECTATIONS

### World Market Conditions Against Intensive Salmon Operations in British Columbia

British Columbia's pack of canned salmon totalled 313,025 cases, up to August 1, as compared with an average pack of 499,251 cases in the corresponding periods in the past five years. Market conditions this year, of course, have not been such as to encourage efforts toward large production and it is interesting to note that the number of salmon canneries licensed in British Columbia is only 35 as against 59 which held licences in 1930.

Obviously, the proper method of pack comparison in the case of the several varieties of salmon, taken separately, is to compare current pack with the output in the brood years, that is, in the years in which the parent fish deposited the eggs producing the present runs. In the case of sockeye, the most valuable of the five species of British Columbia salmon, the pack to August 1 was 213,044 cases as compared with 169,700 cases and 214,611 cases, respectively, in 1928 and 1927, the two years which produced the 1931 return. It will be seen, therefore, that this year's sockeye run has so far developed along the lines to be expected from the brood years. So far as the other varieties of salmon are concerned, it is not expected that there will be intensive fishing effort directed to their capture. The depressed conditions in the world market, which have resulted in a considerable quantity of the 1930 pack being held over, make intensive fishing effort unlikely. As a matter of fact, unless market conditions change materially in the near future, the pack of such fish as pinks and chums in British Columbia will be small.

## FISHERIES OF DOMINION SOURCE OF BY-PRODUCT

(Continued from page 3)

23,500 gallons, or several times the quantity prepared in the other province. Fish oil is produced in all four of the Atlantic provinces, but the Prince Edward Island output has so far consisted of cod oil only. Fish meal is made chiefly in Nova Scotia and New Brunswick, although there is some production in Quebec.

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## SEEK TO BUILD NEW RUNS OF PINK SALMON IN BRITISH COLUMBIA FISHERIES

### Dominion Scientists Carrying on Interesting and Important Experiment at Queen Charlottes as One Phase of Investigations into Life History of Pink Variety

Can pink salmon be induced to change their ways and run abundantly each year in the British Columbia waters which they frequent instead of in every other year?

That's a question of much importance to the Canadian salmon industry for which federal scientists are now seeking to find an affirmative answer.

Seeking for this affirmative answer, the scientists are at work in waters of Graham Island, the most northerly island of the Queen Charlotte group, endeavouring to establish runs of pinks (*Oncorhynchus gorbusha*) in the odd-numbered years in certain areas where these fish are now present only in the even-numbered years. If success can be met with in this case, the same methods can doubtless be successfully applied elsewhere and annual runs of pinks be built up instead of biennial runs.

#### *Pinks Important Variety*

Of late years the pink salmon has come to have very important place in the British Columbia canning industry. It is an excellent food fish but cheaper than some other varieties of Pacific salmon, such as the sockeye or *Oncorhynchus nerka*, and last year nearly 1,112,000 cases were canned. But the pink is a two-year fish; in other words, its life cycle is two years and in the closing part of that period the fish make for the spawning areas, deposit and fertilize their eggs—"seeding" the grounds is the usual phrase—and then die. As a result of this cycle condition, a so-called "on" year, or season of abundance, in any given area frequented by the pinks is followed by an "off" year or year of scarcity. The pinks, however, like other varieties of salmon and like other fish, have their own particular ways of life, and one peculiar circumstance is

that, generally speaking, the large runs of these fish to northern British Columbia waters occur in the even-numbered years while in the southern areas of the province it is the odd-numbered years which are the seasons of abundance.

The seasons of scarcity, it is pointed out by Dr. A. L. Pritchard, of the staff of the Nanaimo station of the Biological Board of Canada, who is carrying on the general pink investigation, may in some cases be of an extreme character. "Probably this is best illustrated," Dr. Pritchard adds, "by conditions in Massett Inlet, which opens on the northern shore of Graham Island. In 1930, in this inlet, over 200,000 cases (of pinks) were canned. This number represented the capture of at least 4,000,000 fish. Furthermore, since the streams were well 'seeded' in all cases, it is safe to assume that at least as many more fish escaped, implying a minimum total run of 8,000,000. Contrasted with this, in 1929 not one pink salmon was seen here, although a thorough inspection was made by officers in the employ of the Dominion fisheries service and of the Biological Board."

What the biennial pink fluctuation means, among other things, is that only in every other year is there an adequate supply of these fish available to the salmon canneries in any district. When the northern canneries can obtain plenty of pinks, the operators in the south lack supply; in the following season the situation is reversed; the year of abundance in the north is the "off" year in the south, and vice versa. The result is that only in every second year can the salmon packers look to the pink fishery to help them in obtaining a return on their heavy investment in

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## PILCHARD BOAT GETS 1,400 POUND TURTLE

### Southern Stranger's Presence off B.C. Adds to Conjecture Touching Pilchard Runs

Everything from sardines to whales are taken in Canada's commercial fisheries but the crew of a British Columbia pilchard seiner got a real surprise this summer when they captured a 1,400 pound turtle off Vancouver Island.

So far as is known, this is the first time a turtle has been sighted off British Columbia, and, incidentally, the creature's presence has added to local conjecture as to whether or not there is any relation between the occurrence of particularly large runs of pilchards in provincial waters from time to time and the presence there, in the same periods, of specimens of marine life which, ordinarily, are found in more southerly areas only.

Five years ago pilchards were abundant off Vancouver Island, and sharks, sunfish, and other marine creatures and growths not usually common in British Columbia waters were also quite numerous at the same time. For instance, the fisheries vessel *Givenchy*, when proceeding from Cape Scott to the Virgin Rocks saw "millions of physalia, commonly known as 'Portuguese Men-of-War,'" which appeared to be of tropical origin and were a form of marine life never before seen in such northerly latitudes by the captain of the ship. Subsequent examination of specimens at the Nanaimo station of the Biological Board of Canada brought out that these physalia were not the typical forms but were what are known as "velvella." This summer the pilchards were running in exceptional numbers off Vancouver Island and once more the sharks and Portuguese Men-of-War and other southerners were more numerous than usual, with the big turtle added for good measure. Some of the fishermen

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## DOCTOR SENT BY GOVERNMENT GIVES BANKS FISHERMEN EXPERT TREATMENT

Nearly 300 Cases, with 29 Operations, Treated at Sea Last Season by Physicians Sent to Grand Banks with Deep Sea Fishing Fleet by Fisheries Department

Home-made remedies and the in-expert "doctoring" of the layman used to be the sole reliance of men on Canada's Grand Banks fishing fleet who chanced to fall sick at sea, but nowadays a doctor's ready at their call.

As one of its services in the interests of the fishing industry, the Dominion Department of Fisheries has sent a physician to the Grand Banks with the fishing fleet each year since 1924, and last summer, for instance, two hundred and eighty-five cases were treated during the season. Twenty-nine necessary operations were performed at sea, though none of them were serious cases, and three fishermen who needed treatment which could not be given them without special facilities were hurried to hospital on C.G.S. *Arras*, the steamer which the department sends to the Banks with the fleet.

Dr. D. R. Webster, the physician who was sent with the *Arras*, last year, not only treated the cases of sickness which occurred on the fishing vessels during their stay of weeks at sea, but he also carried on some investigation as to the causes of hand infections among the fishermen. Other data bearing on the same subject had also been collected by Dr. Webster on previous trips to the Banks. So far as hand infections were concerned, the fishermen were much more fortunate in 1930 than they had been in some other years. "Whereas in some former seasons I have treated as many as sixty of such cases," Dr. Webster reported to the department, "this summer there were only two, and these of a mild character. It was a remarkable observation," he added, "that, coincident with the scarcity of bait and fish, hand infections practically disappeared. Squid were practically absent from the fishing grounds and ports. But the work (of investigation) should be continued as it is a most fertile field for investigations and keen interest was manifested by all concerned."

An interesting point brought out by Dr. Webster in his report is that "the judicious use of brass chains on the

wrists appears to be a large factor in the reduction of infections resulting from chafing by the edge of the oilskin." Infection of this kind can very easily happen, especially in rainy or foggy weather when the fish gurry and such things will be washed down the sleeve on to the broken skin of the chafed wrist, but of fourteen men who had to be treated for this ailment last year all but three had been working without wrist chains.

Respiratory infections have been quite numerous among men of the fleet in some seasons and Dr. Webster has also noted that "dietary troubles are common." Change in atmospheric conditions which the fishermen meet when their vessels reach the Banks in the spring is apparently the predisposing cause of the respiratory infections, while the gastric upsets are due, in many cases, to neglected teeth.

## MARKET IN IRELAND FOR CANADIAN SALMON

Favourable prospects seem to exist for developing trade in Canadian frozen salmon in the Irish Free State, according to a report by the Canadian Government Trade Commissioner at Dublin, J. H. English.

During the past year, Commissioner English says, a small quantity of frozen fish, principally salmon, has been imported into Ireland from this side of the Atlantic, and "development of this trade offers prospects," although the market is not very large, Canadian salmon enjoys high repute on the markets of Great Britain and it would doubtless be well received by the Irish people as well.

Between 15,000 and 16,000 Canadians were employed last year in the Dominion's fish curing plants and canneries.

Fish are more easily digested than most other foods. That's one reason it's well to include fish regularly in the diet.

## BARREN WATER MADE MECCA FOR ANGLERS

Fish Culture Work by Dominion Department Marked Success in Western Lake

Trout weighing from a pound and a half to two pounds have been taken by anglers this summer in Alderson Lake, one of the waters in the Waterton Lakes National Park, Alberta.

"Nice fishing," somebody says, "but nothing remarkable."

But the noteworthy thing is that four years ago there were no fish in Alderson, and the lake is now "a mecca for anglers," to quote a recent report, because of the action taken by the Dominion Department of Fisheries in 1928 in stocking the water with cut-throat trout fry.

The Alderson case is another striking example of what may be accomplished by intelligent fish cultural work in building up the country's fisheries resources.

Ten thousand cut-throat fry from the Waterton hatchery were placed in the lake by the Fish Culture Division of the Department of Fisheries when the first steps toward stocking the barren water were taken three years ago. A second distribution of fry was made in 1929. The fry thrived from the first, apparently, and the superintendent of the hatchery reported to the department a week or two ago that "specimens have been caught (this year) weighing one and a half to two pounds, measuring from 10 to 14 inches in length, and very gamey.

"It had been intended to keep this lake closed till 1932," the superintendent added, "but, while riding by, someone saw these fish jumping and, of course, the news spread immediately, and now it is the most popular body of water in the park."

*Canada Led*

It is interesting to note incidentally that Canada has the distinction of having been the pioneer in fish culture as a governmental enterprise in the New World. The first fry hatched from artificially fertilized eggs in Canada were produced in 1858, and when Confederation was accomplished in 1867, fish culture was established as a Dominion Government service.

## LARGE GAINS IN LOBSTER, MACKEREL CATCH MARKED AUGUST SEA FISHERIES

### Lessened Intensiveness in Operation as Result of Disturbed World Economic Conditions Pulled Down Dominion's Total Landings of Sea Fish for Month

Existing world economic conditions are such as to lessen greatly the incentive to carry on intensive fishing operations and it is not surprising that the catch of Canadian sea fish during August fell much below the total landings in the same month of 1930.

Altogether, the catch of last month, as shown by unrevised statistics collected by the Dominion Department of Fisheries, amounted to a little less than 148,000,000 pounds as compared with more than 237,900,000 pounds in August of last year. On the Pacific coast the catch was approximately 92,875,000 pounds, a decrease of more than 76,000,000 pounds, and Atlantic coast landings were slightly above 55,000,000 pounds, a drop of about 13,000,000 pounds. Total landed value for the two coasts was \$1,810,000, in round figures, as against approximately \$3,987,000 in August, 1930.

Virtually all the principal sea fisheries showed smaller landings than a year ago. Outstanding exceptions to this condition, however, were the lobster and mackerel fisheries of the Atlantic coast. Lobster fishermen made increased catches in all four of the Atlantic coast provinces, notably in Prince Edward Island and New Brunswick. All told, their catch for August was 3,048,600 pounds or 1,005,500 pounds more than the catch which was taken in August of last year. Lobsters are not taken in Pacific waters.

The gain in mackerel landings was due to a very large increase in the catch made by Nova Scotia fishermen, who brought ashore something more than 3,092,000 pounds as compared with only 301,100 pounds in the preceding August. The New Brunswick landings were slightly larger than last year but the case was otherwise in Prince Edward Island while Quebec mackerel fishermen were much less successful than a year ago. The combined mackerel fares for the four provinces was 3,516,100 pounds or more than twice as large a quantity as was taken in August of last year.

#### On The Pacific Coast

On the Pacific coast there was a great decrease in the salmon catch which fell from 84,758,000 pounds, in

round numbers, to 26,721,600 pounds. Lessened intensity in fishing and packing operations accounted in a large part for the decrease but it is to be remembered that this season is an "off" year in the pink cycle in the northern part of the province.

The catch of pilchards for the month amounted to something more than 62,986,000 pounds which was 18,000,000 pounds below the figures for August, 1930. Pilchard runs were large but fewer reduction plants are in operation this year than in 1930 and pilchard fishing has, therefore, been less intensive.

The halibut catch was about 2,488,000 pounds. In August of last year the landings went slightly above 3,125,000 pounds.

#### In The Atlantic Provinces

All four of the Atlantic provinces showed smaller landings than August of last year and in all cases, as on the Pacific coast, there was a sharp decrease in the landed value of the catches to the fishermen. The Atlantic coast catches, by provinces, in the two Augusts were as follows but the figures for August of this year are subject to revision:

	August, 1931 lbs.	August, 1930 lbs.
Nova Scotia. . . . .	21,131,700	30,089,600
New Brunswick. . . . .	17,131,900	23,381,500
Prince Edward Island. . . . .	2,432,500	3,283,400
Quebec. . . . .	8,369,400	11,336,800

As already noted, the mackerel fishermen in Nova Scotia greatly increased their catch last month. The Nova Scotia landings of cod were also larger by about 1,400,000 pounds than they had been in August, 1930, amounting to some 10,312,000 pounds. Catches of lobsters and pollock were likewise somewhat larger than a year ago, and swordfish catch showed a slight gain. Landings in the other principal fisheries fell off.

New Brunswick's lobster catch for the month was 1,778,000 pounds, a gain of some 411,000 pounds. The herring catch, about 6,844,000 pounds, was larger by about 120,000 pounds than in

Continued on page 4

#### SEEK TO BUILD (cont.)

plant and machinery. There is also to be kept in mind the possibility, though perhaps scarcely the probability, that through some catastrophe induced by extraordinary conditions the total pink "seeding" in some district or districts might be destroyed in some year, which would mean a permanent blank there for the future.

#### What's the Explanation?

What explanation there may be for the "off" years is a mystery. Possibly, as Dr. Pritchard says, there may exist "in the 'off' year some deep-seated biological, physical, or chemical factor which prohibits development of the run." Whatever the cause of the phenomenon, it is hoped that the investigation now under way may bring it to light and indicate a method of control. In the meantime, as one important phase of the investigation, an experiment is being made to check the feasibility of building up a run in the 'off' year in Massett Inlet, and it is an experiment which will command a great deal of interest.

This is an 'off' year for pinks at Massett, on the north coast of Graham Island, but at Tl-ell River, on the east coast of the island, there is a limited run. At Tl-ell a number of pinks are being stripped of their eggs, which are being transported to a fish culture establishment which has been erected at McClinton Creek, a good sized stream at the head of Massett Inlet and one which, in the "on" years, supports a substantial run of pinks. All told, 1,000,000 eggs from Tl-ell will be placed in the McClinton Creek station and later on they will be liberated in the creek as fry.

In course of time the fry will migrate to sea. Will they return as mature fish, two years later, to the stream where they first began life and prove the ancestors of successive generations of pinks running to Massett Inlet in the odd-numbered years? That is the question of absorbing interest, and importance. If time answers the question in the affirmative the possibility of obtaining annual pink runs instead of biennial runs will have been demonstrated, with all that this will mean to the further expansion of British Columbia's salmon business.

More than 16,700 gasoline boats and 14,570 sail and row boats were used in Canada's sea fisheries operations last year, in addition to over 1,200 vessels.

## LEATHER MADE FROM SKINS OF CATFISH

### New Market in By-products Field Found for Nova Scotia Catch

Selling the skins for use in the manufacture of leather, a fisherman in Yarmouth county, Nova Scotia, found a market this year for catfish, a variety of fish which fishermen in his district had previously been unable to sell to advantage.

The skins were exported to a United States firm carrying on leather manufacture and samples of the finished product, soft and pliable and dyed in several colours, were subsequently received by the Dominion Department of Fisheries. The total business done by the exporting fisherman was not large but it was suggestive of possibilities for the future. It did not involve the employment of any special processes by the fisherman himself but simply the skinning of the fish and the pickling of the skins for several days prior to shipment. The skins brought about fifteen cents each.

Fishing for catfish is not ordinarily carried on as a distinct operation in Nova Scotia waters but catches incidental to other fishing operations are made off some parts of the province.

## U.S. FISHING VESSELS SEIZED FOR BREACHES

Found fishing in Canadian waters the United States seiner *St. Patrick* was seized by the Dominion fisheries vessel *Givenchy* off Discovery Island, British Columbia, in the latter part of August, and, on the Atlantic coast, the United States swordfishing boat *Natales* was seized by a Customs patrol vessel for taking on ice at North Sydney in violation of the Treaty of 1818. Court proceedings looking to the condemnation of both vessels have been instituted by the Department of Justice at the instance of the Dominion Department of Fisheries.

When taken by the *Givenchy* the *St. Patrick* had her seine in the water and some 2,000 salmon were found on the boat. The *Natales* was seized at night when in process of loading ice at a North Sydney wharf. The boat had 54 swordfish on board.

## MINISTER SPEAKS AT FISHERY CONVENTION

Hon. E. N. Rhodes, M.P., Minister of Fisheries for the Dominion, was the guest of honour and speaker at the closing session of the annual convention of the Canadian Fisheries Association, which was held at Ottawa at the middle of September. In the course of his speech the Minister outlined the work carried on by the Department of Fisheries, dwelling upon departmental effort to assist all branches of the fishing industry while taking care, at the same time, that there is adequate conservation of fisheries resources. He referred also to steps which he has under consideration looking to the expansion of the market for Canadian fisheries products. These possible plans include the operation of a "Fish Train" which would travel through different parts of the country showing various species of fish and processed fish in various forms and including a dining or restaurant car in which fish would be prepared for table by fish cookery experts. This plan and others were being considered, Hon. Mr. Rhodes said, although no definite announcement as to the action which would be taken could yet be made.

Other guests present at the convention beside Hon. Mr. Rhodes included Dr. Harden F. Taylor, an outstanding figure in the United States fishing industry, who brought the Canadians the greetings of the United States Fisheries Association.

### LARGE GAINS (conc.)

the previous August. On the other hand, there were smaller catches of such fish as cod, hake, and haddock. There was also a sharp drop in sardine landings which amounted, in all, to 10,120 barrels, as compared with three times that quantity last year.

There was decreased production in all the Prince Edward Island fisheries except the lobster fishery, but the gain in lobster catch was very striking. In August, 1930, the lobster landings for the province were 485,500 pounds; in August just past they amounted to more than 1,001,000 pounds.

Quebec's lobster catch increased slightly but the returns from the other sea fisheries of the province were smaller than last year.

## WORLD CONDITIONS HIT SALMON CANNING

### Unfavourable Market Situation Operates Against Large Scale Production Effort

Although the pack of canned salmon in British Columbia up to the end of August—up to August 29th, to be exact—was only 556,470 cases as compared with 1,579,899 cases at a corresponding date in 1930, the decrease is not any indication of a depletion in the salmon runs but is the result, chiefly, of the present unfavourable market conditions, combined with the heavy carry-over from last year's production. With world economic conditions as they are, there is, of course, much less than normal inducement to undertake intensive operations. Even the fishing for sockeye, the higher priced salmon, has not been as intensive this year as usual, according to reports made to the Dominion Department of Fisheries by its Chief Supervisor for British Columbia, and at August 29th the sockeye pack totalled 259,852 cases. A second factor tending to keep down total pack this year is that, so far as the pink cycle is concerned, 1931 is the year for the small run of this variety of salmon in the northern fishing areas.

### PILCHARD BOAT (conc.)

see a connection between these two conditions and suggest that higher water temperatures explain pilchard abundance as well as the northward movement of the strangers from the south.

The turtle in the case was sighted by the seiner "Snow King," Captain Henry White, about eight miles off Nootka when the boat was cruising for pilchards. The "Snow King" bore down on the turtle and a few minutes later a shot or two from Captain White's gun ended the wanderer's career. The prize was taken to the Nootka salmon cannery where it was found to weigh 1,400 pounds, measuring nine feet and a half in length, ten and a half feet across, and about a foot and a half in thickness.

Some of the meat was eaten by cannery employees, who found it tender and tasty. A case of canned turtle was also processed at the cannery. The big shell was preserved as a curiosity.

# FISHERIES NEWS BULLETIN

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## RECENT RESEARCH SHOWS FISH FOODS VALUABLE TO CURE, PREVENT, ANAEMIA

### Copper Content of Sea Fish Aid in Bringing Blood to Normal—Iodine, Abundant in Fish, Great Preventa- tive of Goitre—Vitamin D. Richness Makes Sea Food Builder of Health

Ask them to name the sources of copper and probably few people would include sea foods in the list, but fish should be there, especially shellfish, and because of their copper content they have particular value in the diet of anyone suffering from anaemia.

Fish, indeed, are wonderful creatures but it is only of comparatively recent years that science has been finding out how great is the dietary virtue which they possess because of their content of essential elements which are lacking in many other foods.

As was pointed out in a recent address at Ottawa by Dr. Harden F. Taylor, one of North America's foremost fisheries research authorities, every element necessary to life is found in the ocean and, taken into the body of the fish in feeding, may be passed on to man through his diet. On the other hand, many land areas are deficient in some of these elements necessary to life and strength and the flesh of cattle and other land animals is frequently lacking in them.

But to get back to fish and copper: A few years ago scientific research revealed that liver has a remarkable curative effect on certain types of anaemia, or thin-bloodedness, which is marked by an insufficiency of the iron-containing compound, haemoglobin, the red colouring matter in the blood. What liver accomplished, apparently, was to enable the body to absorb necessary iron and thus to build red blood, but why did it have this effect?

More scientists went to work to study this question. Now they have discovered that the active principle of liver is copper, and where iron is present "as it usually is in the diet, traces of copper cause the red corpuscles and haemoglobin in blood to come quickly to normal. This remarkable discovery," said Dr. Taylor,

"is now confirmed beyond peradventure," and as all sea foods, especially the shellfish, appear to contain copper their value in the diet of persons inclined to be anaemic is at once obvious.

#### Other Health-Builders

Iodine is another element which is relatively abundant in fish but often lacking in other foods, and it is iodine which is the great preventative of such diseases as goitre. Iodine occurs in all sea water—indeed, most of the world's entire store of iodine is in the sea—and, therefore, in the flesh of fish while, on the other hand, there are wide inland areas in Canada and other countries which contain virtually no iodine at all to pass into the flesh of animals which live upon the land and thence into the human body.

But iodine and copper are not the only elements of special value as health builders which occur in fish in greater quantities than in other foods. Far from it. For instance, there is lime or calcium, the bone-forming substance. Some fish, such as haddock, have a lime content nearly five times as high as other common foods, and sea foods as a class are rich in this substance. Then, too, fish foods supply vitamins—the wonder-workers of comparatively recent discovery.

There are vitamins in different foods, of course, but no food so far studied, it has been pointed out by Dr. E. V. McCollom, of Johns Hopkins University is comparable to the oils of fish in content of the noted Vitamin D, the vitamin which gives medicinal cod liver oil its great health-building potency. For a time, perhaps, it was thought that whatever element made cod liver oil so efficacious was peculiar to this oil alone but research has now established that this is not the case

(Continued on page 3)

## OYSTER FARMING PLAN ADOPTED FOR P.E.I.

### Development of Important Industry Foreseen under Fisheries Department Policy

In tribute to its agricultural richness, Prince Edward Island has sometimes been referred to as "a million acre farm" but the acreage farmed will be made still bigger under a policy which has been adopted by the Dominion Department of Fisheries to encourage the establishment of commercial oyster farms in the province.

Oyster "farming"? Certainly. Commercial oyster farming—already an important industry in different countries—is quite as feasible as agriculture, under proper conditions, and more profitable, too, and investigations and experiments which the Department of Fisheries has been carrying on for the past year or two in Prince Edward Island have shown plainly that oyster farms can be most successful there. One bit of evidence as to the possibilities is that a small area in Bideford River, which was planted with oyster spat in 1928 now has on it some 200,000 oysters which will be ready for market next year.

The department's work has demonstrated not only that oyster farming can be successfully undertaken in Prince Edward Island but that the methods requisite to success are neither difficult nor unduly costly. In view of this fact it is believed that in the course of a few years commercial oyster culture can be made a very important industry in the province. Of course, oysters are already marketed from natural beds in all three of the Maritime Provinces, and there is also production in British Columbia, but the trade in these fine shellfish is capable of much expansion so that satisfactory demand may be expected for the production from any "farms" which may be established.

Under the plan now adopted for encouraging people to take up oyster farming in Prince Edward Island, where complete jurisdiction over the oyster beds is vested in the department, for

(Continued on page 3)

## ADVERSE MARKET CONDITIONS LESSEN FISHING INTENSITY, CATCH DECREASES

### Landings from Dominion's Sea Fisheries for First Nine Months of Current Year Show Drop below Figures for January-September Period of 1930

Canada's sea fisheries production in the first nine months of 1931 was considerably smaller than the catch in the corresponding period of 1930 but the change reflected world market conditions rather than indicating a lessening in the quantity of fish available for capture.

With world economic conditions unsatisfactory, operations in the fisheries have naturally been less intensive than in other and normal years.

The total landings from the sea fisheries of the Dominion in the period between January 1st and September 30th was approximately 675,989,000 pounds, according to unrevised statistics gathered by the Dominion Department of Fisheries, while in January-September, 1930, the catches totalled a little more than 818,414,000 pounds. With market conditions unfavourable, the landed value of the catches to the fishermen has, of course, also fallen off very sharply this year, amounting in January-September to \$11,816,300, in round figures, as compared with \$20,566,800 a year ago.

#### September Results

Taking results for the month of September, there was a decrease in catch and landed value on both Canadian coasts. Pacific coast landings were 59,493,300 pounds, with a landed value of about \$665,615; in September, 1930, the catch was over 95,700,000 pounds and landed value was \$1,580,856. Atlantic fishermen brought ashore 41,695,500 pounds during the month, as against 65,585,700 pounds in the previous September, and the fish had a landed value of \$652,140, or a decrease of about \$607,000.

Combining the September figures for the two coasts, there were landings totalling 101,189,300 pounds, with a landed value to the fishermen of \$1,317,750, as against 161,299,300 pounds and \$2,840,560 in September, 1930.

#### In Eastern Waters

Total catch and total landed value were smaller in all four of the Atlantic coast provinces in September than a year ago. In Nova Scotia returns from virtually all of the fisheries showed

decreases, although there was gain, both as to size of catch and landed value, in the case of the clam fishery. In New Brunswick there was a substantial increase in herring catch and a small increase in herring landed value. The other fisheries of the province were, generally, less successful than in the preceding September. The Prince Edward Island fishermen caught more cod and herring than last year, with herring landed value increasing slightly, and in Quebec, too, the herring fishermen did somewhat better than in 1930. In none of the Maritime Provinces was the lobster fishery as successful as in the September before. Lobster fishing is not permitted in Quebec in September.

The figures for total catches and landed value in each of the Atlantic provinces in the two Septembers are as follows:—

	September 1931	September 1930
Nova Scotia—		
Catch. . . lbs.	22,659,900	40,508,400
Landed value. \$	342,689	780,164
New Brunswick—		
Catch. . . lbs.	13,411,400	18,074,800
Landed value. \$	213,202	289,149
Prince Edward Id.—		
Catch. . . lbs.	1,011,800	1,814,700
Landed value. \$	29,339	60,309
Quebec—		
Catch. . . lbs.	4,612,400	5,187,800
Landed value. \$	66,908	130,085

#### On the Pacific Coast

In British Columbia the September salmon landings amounted to 20,007,000 pounds, a decrease of more than 13,000,000 pounds from the figures for September of last year. In the halibut fishery, another of the major Pacific coast fisheries, there was a catch of about 2,250,000 pounds, as against 2,874,300 pounds in 1930. Pilchards were running in abundance but market conditions checked the intensity of the fishing and the month's pilchard catch was only 36,550,000 pounds, or less by about 21,000,000 pounds than last year. Somewhat more herring were taken in the September before, though the total catch was not large, and there was a small gain in landed value.

## ENSURE SOUND QUALITY IN DRYSALT HERRING

### New Regulations as to Processing and Inspection of Important Export Product

Continuing its emphasis upon quality production, the Dominion Department of Fisheries has taken action to give further assurance that thoroughly sound practice is employed in drysalting herring and to add to the effectiveness of the inspection of the product.

Drysalted herring, which are put up in British Columbia only, so far as Canada is concerned, are exported to China in very large quantities and it is important that the pack be of satisfactory quality at all times.

Under changes which have now been made in the fish inspection regulations applicable to the drysalting of herring, provision is made for a daily inspection of operations in each saltery by a trained departmental inspector. The period in which the fish must be left in the salting tanks is lengthened by 24 hours and specific conditions are laid down as to the degree of brine salinity to be maintained, the draining of the herring on their removal from the tanks, etc. Daily salinometer tests will be made in each tank by the inspecting officer to make sure that a salinity of at least 90° is being maintained.

Heretofore the inspection of herring drysalting was done by temporary officers but now the work is to be in the hands of the regular fishery officers of the department, Fishery Inspectors as they are known officially. These officers are being given special training to equip them to perform this new service efficiently. Some instruction was given them by the Department's Director of Fisheries Promotion and Inspection on a recent trip to the Pacific coast when he also had Dr. N. M. Carter, of the Pacific Biological Station, Nanaimo, address them in regard to some of the scientific points in connection with the use and effect of salt. During the coming winter the inspectors will be required to take a course of instruction, prepared by the Biological Board of Canada, and to pass an examination in the subjects taught.

No Canadian needs to look to the import market for his fish foods. The Dominion's fisheries produce some 60 varieties of food fishes, and they're of unexcelled natural quality.

## PROBABLE EFFECT OF POWER PLAN ON FISHERIES STUDIED BY SCIENTISTS

### Noted Research Authorities Retained by Canada and United States in Joint Investigation off New Brunswick and Maine where Sardine Fishery of Great Importance

Co-operating again in a joint investigation into a fisheries question of mutual moment, Canada and the United States are carrying on through scientists of international repute very important investigations off southwest New Brunswick and northern Maine with a view to determining what effect proposed large power dams in the Passamaquoddy Bay area would have upon the herring fishery and other fisheries in that part of the continent. The herring fishery, which in this area is the basis of the sardine industry, is worth hundreds of thousands of dollars in production every year and its conservation is thus a matter of first rate importance.

The investigators, who are working under a joint commission representative of the Dominion and the United States, include Dr. H. H. Gran, a distinguished scientist who is a member of the staff of the University of Oslo in Norway, Michael Graham, M.A., of the scientific staff of the Ministry of Agriculture and Fisheries in Great Britain, who is one of the well known fisheries experts of the Old Country, Dr. Charles J. Fish, director of the Museum of Science at Buffalo, N.Y., and Dr. E. E. Watson, of Queens University, Kingston, Ont. Acting as an advisory board for the commission are four other well known scientists—Dr. H. B. Bigelow, director of the Oceanographic Institution at Woods Hole, Mass., Dr. A. E. Parr, of Yale University, New Haven, Conn., Dr. A. W. H. Needler, of the staff of the Biological Board of Canada, and Professor F. R. Hayes, of Dalhousie University, Halifax, N.S.

The investigation was instituted by the United States and Canada following on applications from a power corporation for permission to construct large dams in Passamaquoddy Bay. Fears were expressed in different quarters that the erection of the dams would have serious adverse effect upon the herring fishery, and a study of the question by a commission representative of the two countries was decided upon. In the meantime, permission for the power construction was withheld.

W. A. Found, Deputy Minister of Fisheries, and Dr. A. G. Huntsman, of the Biological Board staff, were named by Canada as members of the commission and Henry O'Malley, federal Commissioner of Fisheries, and O. E. Sette, officer in charge of Atlantic fisheries investigations for the Bureau of Fisheries, were named by the United States. At the first meeting of the commission Mr. Found was chosen chairman.

The commission established its research headquarters at the Atlantic Biological Station at St Andrew's, N.B., and appointed Dr. Fish as its executive secretary. Dr. Fish, an authority in this field, is also conducting the necessary zooplankton studies and the phytoplankton work is in the hands of Dr. Gran. An exhaustive study of the herring is being made by Mr. Graham, who has been given leave of absence from his regular work by the British Government so that his services may be available to the commission. The hydrographic research is being done by Dr. Watson.

The investigation was begun some weeks ago, although Mr. Graham was unable to reach Canada to begin his part of the work until about the middle of September.

#### OYSTER FARMING Con.

administrative purposes, under an agreement made with the provincial authorities several years ago, leases for areas which the department believes suitable will be granted at small annual rentals. Each lease will be for a term of 20 years and will be renewable for a like period. The information obtained by the department's investigators will be at the disposal of lessees. In addition to the annual rental which will be charged, a reasonable royalty on production will also be collected after the lease has been in effect for five years as at the end of that time operations should be on a substantial paying basis.

## CHIEF SUPERVISOR FOR EASTERN AREA NAMED

### Major D. H. Sutherland Chosen by Commission as Administrative Head in Eastern Division

Major Donald H. Sutherland, who has been the supervisor of Fisheries for District No. 2, Nova Scotia, under the Dominion Department of Fisheries, has been selected by the Civil Service Commission to fill the office of Chief Supervisor of Fisheries for the Maritime Provinces and the Magdalen Islands, or Eastern Division. This position, through which fisheries administrative work in the Maritime Provinces and the Magdalens is co-ordinated, has been vacant for some time. Major Sutherland, who took over his new duties in October, will have his headquarters at Halifax.

The Chief Supervisor served at the front with the Canadian forces during the Great War, and entered the fisheries service in 1921 when he was appointed Inspector of Fisheries for District No. 2, Nova Scotia, which is made up of the eastern mainland counties of the province. He has been an efficient and energetic officer. Major Sutherland, who is a native of Nova Scotia, obtained his early education in the schools of that province and subsequently studied at the University of Mount Allison, Sackville, N.B.

#### RECENT RESEARCH Con.

and that the oil distributed through the bodies of various fishes such as herring and salmon is similar to the liver oil of the cod in vitamin potency. In other words, the inclusion of fish regularly in the family diet means that the household will be supplied with an adequate allowance of Vitamin D just as surely as though doses of cod liver oil were taken.

Vitamin D, of course, is especially valuable in the diet of growing children, and its presence in fish is an excellent reason for including these tasty sea foods frequently in the menu in homes. In Canada, moreover, it is possible to have fish foods frequently on the table without causing monotony in the diet for more than 60 different varieties of food fish of highest quality are taken in the Dominion's commercial fisheries.

## MORE FISHWAYS AID FISH CONSERVATION

### New Works to Help Fish Ascend Streams to Spawning Grounds Put in Service

Two important new fishways, one in British Columbia and the other in Nova Scotia, were added by the Dominion Department of Fisheries this summer to the country's devices for ensuring continued maintenance of adequate stocks of fish.

To the uninitiated the purpose of fishways may not be altogether clear but their importance may be realized when it is pointed out that they are a means of ascent past falls, rapids, or dams, which might otherwise prevent a good many fish from reaching their spawning grounds. Expressed in other words, the fishway is a man-made agency for helping in fish conservation, a work which it performs by enabling the parent fish to get to the spawning beds at the proper season and so to perpetuate the runs from generation to generation. Briefly and non-technically described, the fishway, in form, is a channel constructed in such a way as to overcome a height of water by gradual stages. The fish pass from pool to pool in the channel, each pool being on a slightly higher level than the one below but not so much higher that the fish cannot make the ascent. In this way it is possible for the fish to pass obstructions which, at certain stages of the water at all events, numbers of them could probably not otherwise surmount.

#### *Will Help Salmon*

The Nova Scotia fishway of importance erected this summer under the direction of the Engineering Branch of the Department of Fisheries is on the Tusket River, Yarmouth County, and was built especially for the purpose of giving passage to salmon seeking to make their way up the river to spawning areas beyond a diversion dam constructed by the Nova Scotia Power Commission. It is approximately 120 feet long and 10 feet wide and overcomes a head of about 15 feet. An earlier fishway in this locality served alewives well but, for some reason, the salmon did not use it satisfactorily, and as the conservation of the salmon stocks is of much importance the new work was decided upon by the department.

## INDIANS' DRAG SEINES TAKE 150,000 SALMON

Indians using drag seines captured slightly more than 150,000 salmon in British Columbia waters last year—not a large number of fish, of course, as compared with the total catch of salmon but sufficient, none the less, to bring in a fairly tidy sum of money to be added to the return the Indians obtained from their work in other kinds of salmon fishing.

The use of drag seines in fishing for salmon is permitted to none but Indians in British Columbia and may be carried on in certain areas only. It takes place at river mouths and the method of operation is very simple. One end of the seine, which is not more than 600 feet long, is staked to the shore and when a school of salmon is sighted the Indians put out in a flat-bottomed boat or skiff and row around the fish, paying out the net until the second end has been brought back to the starting point, when the catch is pulled up on the beach. Lead and float lines keep the net suspended vertically in the water as it is paid out from the skiff and as the lead line rests on bottom the salmon cannot escape the enclosure that is formed as the seine is dragged shoreward.

The new British Columbia fishway—at Skutz Falls on the Cowichan River—also serves the salmon, and serves the trout, too. It should be especially valuable in helping the Spring salmon to reach their spawning grounds in the Cowichan area as natural water conditions at Skutz Falls are often unfavourable at the season when the Springs are seeking ascent. The fishway proper is about 100 feet long and overcomes a height of some 16 feet.

With the work completed, "Mr. and Mrs. Salmon and their like," to quote one observer, "can now swim to the foot of the rapids, take the first turn to the right, mount seven easy steps, rest in seven pools if they wish, then take a turn to the left and swim along a nice channel which brings them out above the falls. Best of all, they will be able to do this at all stages of the water." The Skutz fishway was finished some weeks ago and fish have been putting it to its intended use.

Approximately 53,800 barrels of the herring caught by Quebec fishermen in 1930 were used as bait.

## AIDING NATURE IN SALMON PRODUCTION

### Atlantic Salmon Culture Valuable Part of Work of Dominion Fisheries Department

Millions of Atlantic salmon eggs are now being collected by the Fish Culture Branch of the Dominion Department of Fisheries for incubation this winter in its Maritime Province hatcheries so that suitable streams may be stocked with more fry next spring and summer.

By action of this kind the Department each year assists Nature in maintaining and increasing the stocks of different varieties of fish in various parts of the country. Past distributions from the hatcheries to selected waters have included great numbers of eggs, fry, etc., of such species of fish as Atlantic and Pacific salmon, whitefish, pickerel, and several kinds of trout.

Carrying on its work with the Atlantic salmon, which is a species distinct from the salmon of the Pacific, the Fish Culture Branch each year obtains some thousands of parent fish, strips the females of eggs at the several salmon ponds which it conducts in the Maritimes, fertilizes the eggs with the milt from the male fish, and then transfers the eggs to the hatcheries where they remain in the hatching troughs until incubation takes place. Later on, the resultant fry and fingerlings are distributed in suitable waters in the provinces.

This year a new salmon pond is being operated, one at the Nictaux Falls dam near Middleton, N.S. It is expected that some 500 parent salmon will be handled in the Nictaux stripping. Other ponds where stripping is done are at Margaree Harbour, N.S., New Mills, N.B., South Esk, N.B., Little River, N.B., and Morell River, P.E.I. Reports to Ottawa at mid-October showed more fish on hand at the Margaree pond than had been available at the corresponding date last year, at New Mills about 475 fish in the pond, and at Little River more than 1,600, which was a much larger number than a year ago. Impounding was getting under way at Morell River. The outlook at South Esk was that the pond's full quota, 3,000 salmon, would be available when stripping began.

One reason why fish are desirable food is that they contain such health-building elements as vitamins and iodine.