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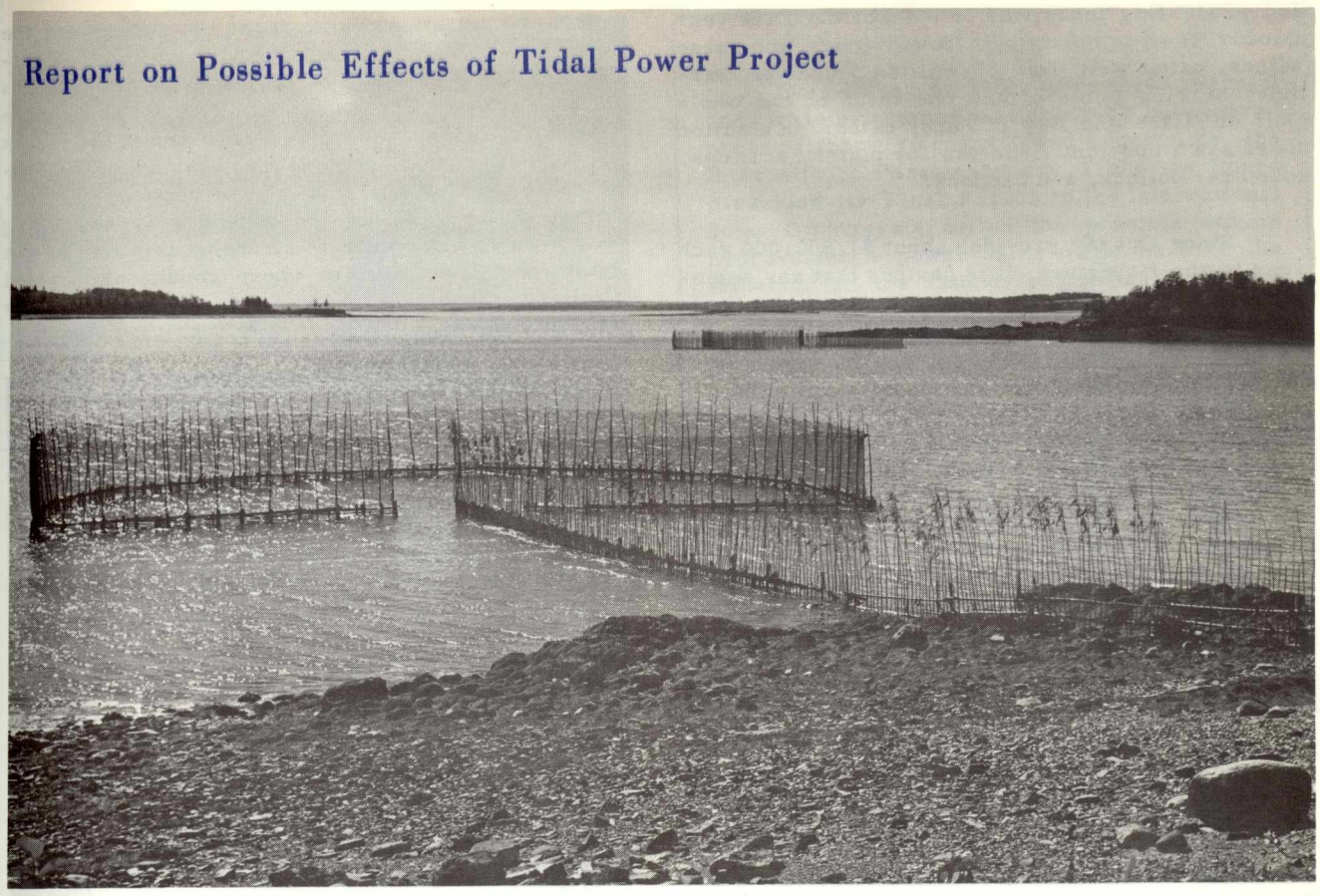
CANADIAN FISHERIES NEWS

FISHERIES NEWS FROM ABROAD

COVER PHOTOGRAPH: CBC Commentator Mike Gillis chats with Fisherman Tom Greek of Blue Rocks, Lunenburg Co., N.S., about the relative merits of the Norwegian jig and the local jig used for handlining. See article on Fishermen's Broadcasts, page 14.



Typical herring weirs. In the foreground a simple weir without a parlor. In the background a compound weir with a parlor in which herring are held alive awaiting sales

PASSAMAQUODDY FISHERIES INVESTIGATIONS

By S.N. TIBBO and L.R. DAY

SYMBOLIZING today's search for new power sources to meet tomorrow's demands is the $3,300,000 "look" at the possibility of generating electric power from the tides in the Passamaquoddy region. After three years of intensive study by Canadian and United States specialists, final reports on the economic feasibility of the Passamaquoddy Tidal Power Project were presented to the International Joint Commission at Ottawa in October, 1959.

Passamaquoddy, an Indian word meaning "great pollock waters" is a relatively small North Atlantic estuary. Its 140 square miles lie on the international boundary between the State of Maine in the United States and the Province of New Brunswick in Canada. Four times a day, about two billion tons of water boils through the deep, narrow passages connecting Cobscook and Passamaquoddy Bays to the Bay of Fundy, raising and lowering water levels as much as 26 feet. For 30 years, engineers have considered harnessing these tremendous tides to produce electric power.

In 1956, Canadian and United States governments, through the International Joint Commission, requested detailed study of this great power potential. It set up the International Passamaquoddy Engineering Board to consider the engineering aspects of the problem. But "Quoddy" is unique in yet another respect. For over a century she has supported one of the most productive herring fishing

and processing industries in the world. Each year Quoddy fishermen, with brush weirs and purse seines, catch well over 50 million pounds of "sardine" herring -- more than one-third of the whole Gulf of Maine and Bay of Fundy catch. In addition there are important fisheries for clams, scallops, lobsters, pollock, and haddock.

Since Quoddy provides about $1,500,000 each year to the fishermen, it is obvious that any engineering dreams of putting her tides to work must give serious consideration to possible effects on the existing fishery resources.

Accordingly the International Passamaquoddy Fisheries Board was set up to cover the interests of the fisheries in the region. The Board initiated programmes of research in oceanography, biology, and economics. These were carried out jointly by the staffs of the Fisheries Research Board of Canada and the United States Bureau of Commercial Fisheries. These studies were related to engineering details of the construction and operation of the proposed project. Together they provided a basis for forecasting the effects of the proposed power structures on the Quoddy fisheries.

In the two-pool project plan selected by the engineers for detailed design, Passamaquoddy Bay is the high-level pool and Cobscook Bay is the low-level pool. They are separated from the Bay of Fundy by dams with filling or emptying gates and joined by the power house in between. Passamaquoddy Bay is filled at high tides and Cobscook Bay is drained at low tides. In the fisheries research programme, consideration was given first to anticipated changes in oceanographic conditions, since any changes in the fishes' environment would affect their distribution, behaviour, and abundance. Changes in the fish stocks would, in turn, affect the economy of the fisheries in the area.

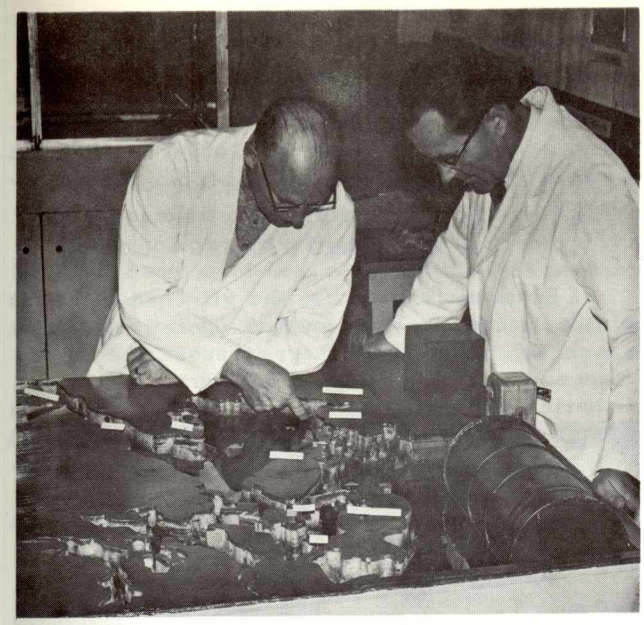
OCEANOGRAPHIC STUDIES

During 1957 and 1958, the temperature and salt content or salinity of the waters in and around Passamaquoddy and Cobscook Bays, were observed at 14 locations which were visited a total of 43 times. In addition, data were available from five special series of observations; from two locations which were visited monthly by the St. Andrews Biological Station for nearly 40 years, and from surface temperature observations made at the station twice daily since 1921. Water currents were measured at 60 locations. At most locations, continuous observations were made over a full tidal cycle of 25 hours. At key locations, observations continued over a 72-hour period. Non-tidal drift of surface waters was traced from the recovery of nearly 2,500 drift bottles from more than 10,000 released, and by tracking the movements of drift poles by radar. Electro-magnetic apparatus was used to calculate the water movements in the estuary of the Saint Croix River; at Lubec Narrows and in Western and Letite Passages. Surface water currents in the Bay of Fundy and the Gulf of Maine were traced from the recoveries made since 1919 from 35,000 drift bottles released in these areas. Temperatures, salinities, and oxygen content were observed at 22 locations and fishing gear set during four seasonal visits to Kennebecasis Bay on the Saint John River system where conditions seemed similar to those expected in Passamaquoddy if dams were installed.

Temperature experiments were carried out in the laboratory to determine whether herring could withstand anticipated temperature changes in Passamaquoddy and Cobscook Bays. In the above photograph, temperatures are being checked and recorded

Results of the studies were then used to determine the oceanographic changes that might be expected in the Quoddy region as a result of the installation of dams according to the engineering proposal. Of the many changes indicated, the following have a bearing on the future of the fisheries.

The present average level of Passamaquoddy Bay, the high-level pool, will be raised about six feet and the level of Cobscook Bay, the low-level pool, will be lowered about five feet. The patterns of water currents inside both bays will be changed drastically. With the gates which fill Passamaquoddy Bay closed about 19 hours out of 25, the only water movement will be towards the powerhouse. With the gates which fill Passamaquoddy Bay open, the patterns of water currents should remain unchanged but will move more slowly. When the gates emptying Cobscook Bay are open, water movements



The authors -- L. R. Day (left) and S.N. Tibbo (right) examining a model of the Passamaquoddy Power Project

there will be similar to those now found at half-ebb tide. When these gates are closed, the surface waters will spread slowly in all directions from the powerhouse.

Water temperatures inside the Bays will be changed. There will be greater seasonal variations in temperature particularly at the surface. Highest summer water temperatures are expected to be about 68 degrees Fahrenheit. Ice is expected to cover part of the area in the winter. Waters will be less salt particularly in Cobscook Bay and at the surface in Passamaquoddy Bay. Oxygen content of the deep water may be reduced somewhat but is unlikely to fall below 50 per cent saturation.

No significant changes in oceanographic conditions are anticipated outside the two bays except in the area immediately adjacent to the dams.

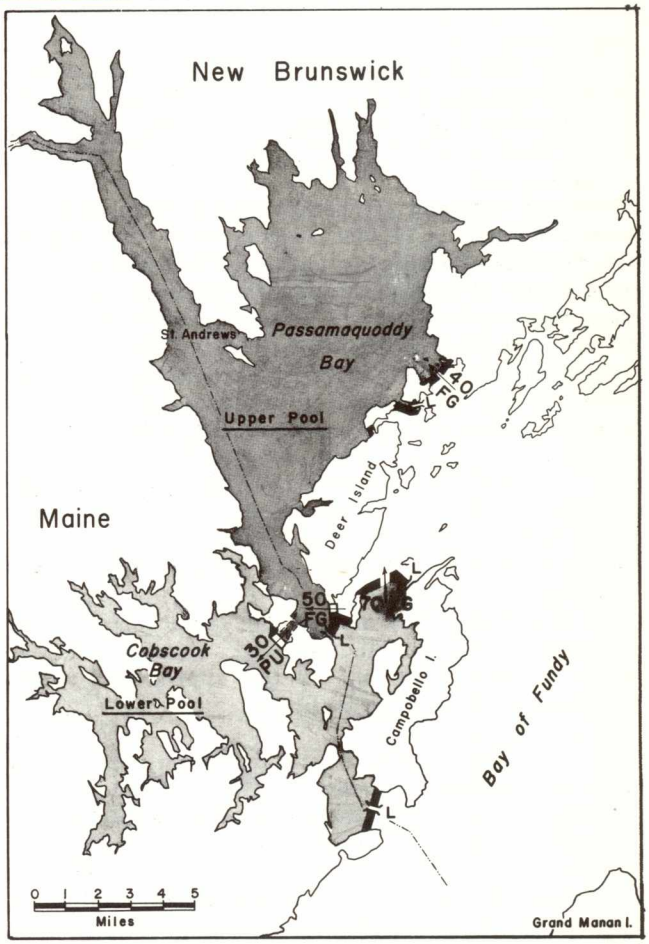
BIOLOGICAL STUDIES

The primary aim of these studies was to provide information on the abundance, distribution, habits, and reproduction of fish stocks in the Quoddy region. Since herring make up more than 80 per cent of the total landings, the biological studies placed major emphasis on herring. Basic questions needed answers. Where are the spawning and nursery grounds for Quoddy herring? Is the Quoddy stock one or more populations? Are Quoddy herring carried into the area by the water movements or do they move in deliberately? In other words, what makes the Quoddy herring fishery?

Many aspects of the life history of herring were explored. Landings were examined by coun-

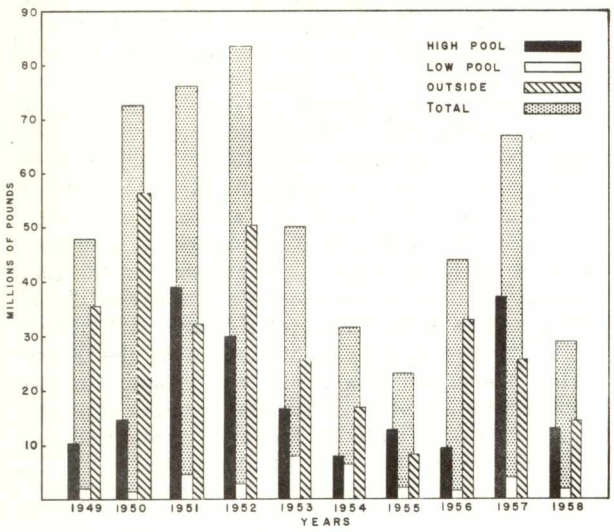
Source of this Article

On October 6, 1959, after three years of intensive international study by oceanographers, fishery scientists, and economists, the International Passamaquoddy Fisheries Board presented its Final Report to the International Joint Commission on the possible effects hydro-electric power dams might have on the fisheries in the Quoddy region of the Bay of Fundy. Members of the Canadian Section of the Board were officials of the federal Department of Fisheries and its scientific arm, the Fisheries Research Board of Canada -- Dr. J.L. Hart, St. Andrews, N.B. (chairman), and Dr. A.L. Pritchard, Ottawa. Members of the Canadian section of the Board's Research Committee were S.N. Tibbo (chairman), L.R. Day, R.W. Trites and R.A. McKenzie of the Fisheries Research Board and W.F. Doucet of the Economics Service of the Department of Fisheries. This article by Messrs. Tibbo and Day is based on the Board's Final Report.



Passamaquoddy Tidal Power Project plan selected for detailed design. The plan shows the location and numbers of filling gates (FG), emptying gates (EG), power units (PU), and navigation locks (L) in the dams

ties for the years 1920 to 1928 and monthly landings by statistical districts for 1937 to 1958. During 1957 and 1958, the daily landings were collected for individual units of fishing gear. Personal interviews with fishermen provided additional information for the period 1947 to 1957. Comparisons of



Total (Canadian and United States) herring landings in the high and low pools and in the part of the Quoddy Region outside the proposed dams

herring length and age compositions were made on samples totalling 71,000 lengths and 23,000 scales. Observations on herring parasites and tests of herring blood serum were made to determine possible population differences in herring samples taken from Newfoundland to New Jersey. In 1957 and 1958, more than 137,000 herring were tagged in the Quoddy region and their movements analyzed in an attempt to discover their source and fate.

To discover whether herring could stand anticipated changes in hydrographic conditions in the bays, their tolerance to various water temperatures, salinities, and pressures were tested. Their behaviour in water currents of varying strengths was observed. The swimming speeds of herring and their depth distribution were studied to determine likely movements in the approaches to the proposed dams and the turbines.

Over 1,400 tows were made with fine mesh nets in the Bay of Fundy and Gulf of Maine. They showed the distribution and abundance of herring larvae as indicators of spawning grounds and nursery areas. They also gave information on survival, growth and how herring reach the Quoddy region. A further 2,500 tows and almost 1,700 herring stomachs provided information on the food and feeding habits of herring. These data permitted tests of probable relationships between abundance of food and commercial catches of herring. Electronic fish finders and various kinds of fishing gear were used to learn about the movements of herring and to locate unexploited herring stocks.

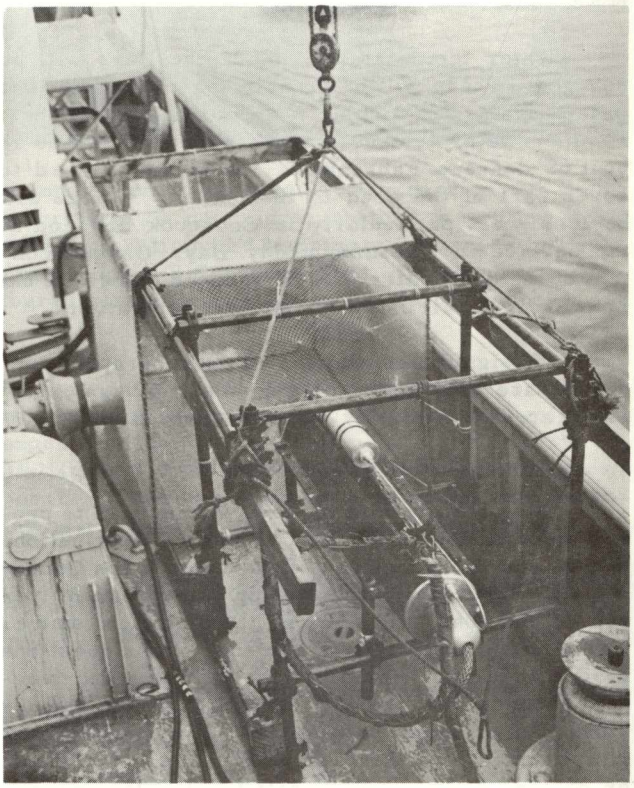
Shellfish and fish other than herring were studied too but were not given the detailed treatment accorded to herring. Recent landings and available information on their biology were reviewed.

ECONOMIC STUDIES

Economic surveys of the principal fisheries of the Quoddy region covered operations for the years 1956 and 1957. They assessed the investment and income position of herring and lobster fisheries, including the herring carrier fleet, and determined the value of investment in plant and equipment and the manufacturing costs of fish-processing establishments. Groundfish and shellfish, of commercial importance too, were studied from other statistical sources.

FORECASTING THE EFFECT OF THE PROJECT ON THE QUODDY FISHERIES

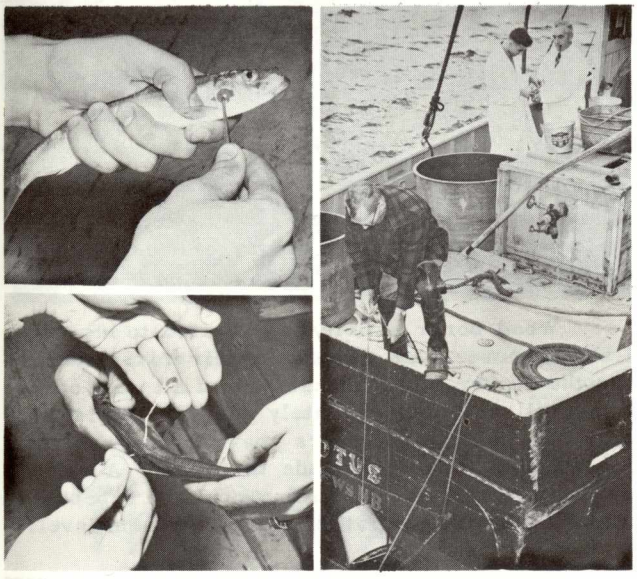
Results of biological investigations were examined in the light of anticipated hydrographic changes. They formed the basis for predicting the effects of the proposed dams on the various fish species. Some of the more important results and predictions follow.



Underwater television camera and holding cage used to determine the reaction of herring to currents and their swimming speeds

The herring population is produced outside the Quoddy region, probably off southwest Nova Scotia. The general abundance of herring in the Bay of Fundy and the Gulf of Maine is unlikely to be affected.

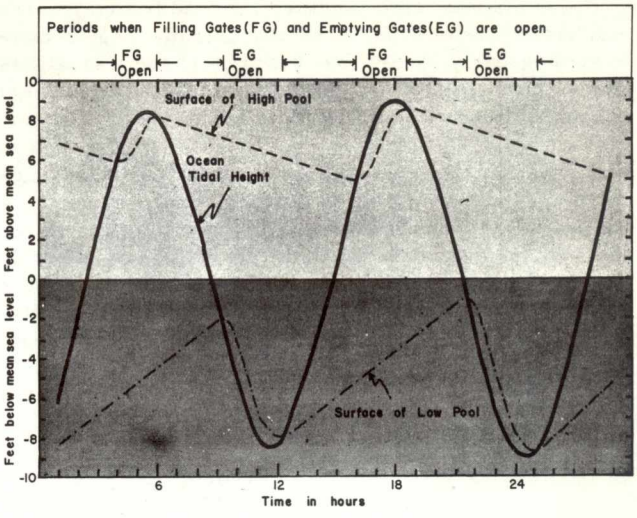
Electronic fish-finder searches show that a large proportion of herring are in the open waters of Passamaquoddy Bay where no fishery takes place. Some evidence suggests that the present fishery takes only a small proportion of the available fish stocks. Tagging experiments also show that herring move freely throughout the Quoddy region during the fishing season.



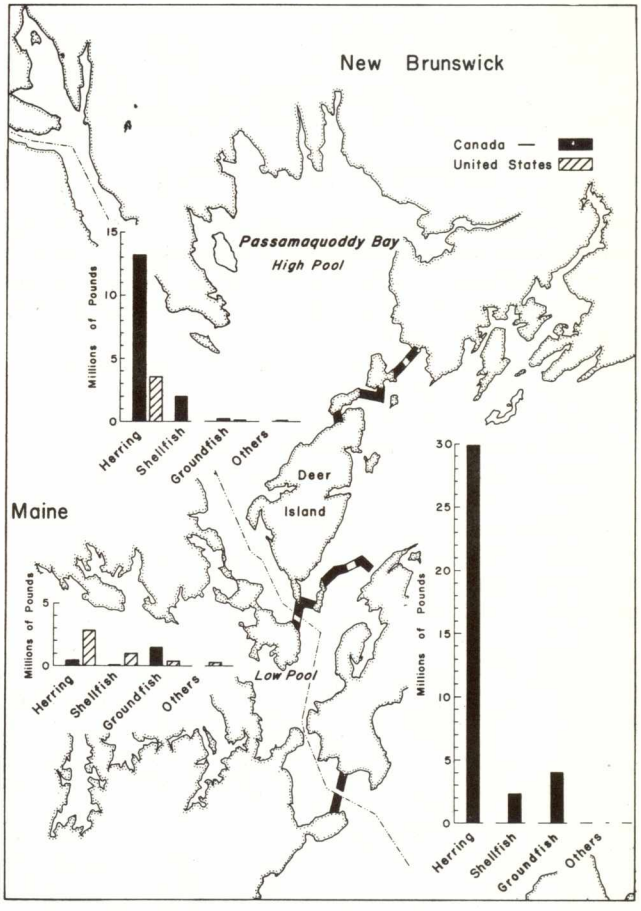
Herring tagging operations with two types of tags shown at left

Since there are unlikely to be any significant changes in oceanographic conditions outside the dams, herring should arrive in this area as before. There will be little change in the speed of the water currents at the approaches to the open filling gates. Since velocities of the water currents are well above the maximum sustained swimming speed of herring, the fish will be carried through the filling gates. Since the filling gates are only open for about six hours each day, movement of herring into Passamaquoddy Bay is expected to be delayed. This is also true for Cobscook Bay where entry will be chiefly through turbines. Although the rate at which herring accumulate will be slower, there should be no reduction in overall abundance inside the Bays.

Predicted changes in water temperatures and salinities are expected to make the areas inside the dams no less favourable for herring. High temperatures and low salinities may cause some mortality in isolated areas. Predicted pressures and rates of pressure change between the turbine intakes and exits are within limits which herring can stand.



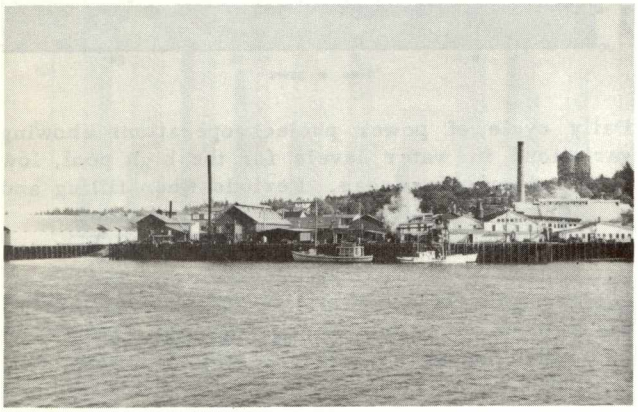
Daily cycle of power project operations showing variations in water levels for the high pool, low pool and outside areas. Periods when filling and emptying gates are open are also shown



Average Canadian and United States annual landings of herring and other species in the Passamaquoddy area

Annual herring landings from individual weirs and from various parts of the Quoddy region have varied greatly over the years. These variations are of far greater magnitude than the changes that are expected as resulting from the dams.

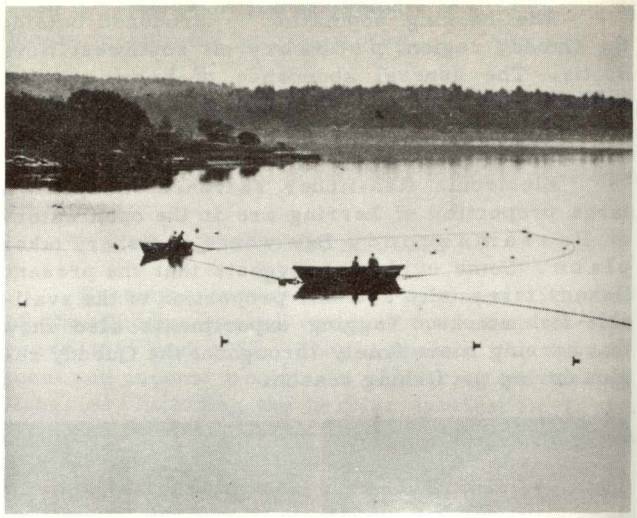
No measurable change in groundfish landings in the Quoddy region is anticipated. However, a change is expected in the species composition of the fraction of the catch taken inside the dams. Inside the dams, winter flounder fisheries may increase while haddock and pollock fisheries will be greatly reduced. Clam fisheries will be greatly reduced for a period of ten years and then may become re-established at a lower level of production. Scallop



A Canadian sardine cannery

stocks should increase substantially. Inside the dams, a modest increase in production of lobsters is anticipated. Conditions for anadromous species such as Atlantic salmon and alewives may be improved. Smelt, shad, and sea-run trout stocks should increase. Striped bass and tom cod thrive in areas where temperature and salinity conditions are similar to those predicted for Passamaquoddy and Cobscook Bays. Some reduction is expected in the availability of marine worms and rockweed.

The construction of dams will eliminate six existing herring weir sites. Other weirs may have to be relocated or altered to suit the new oceanographic environment. Weir stakes and nets will

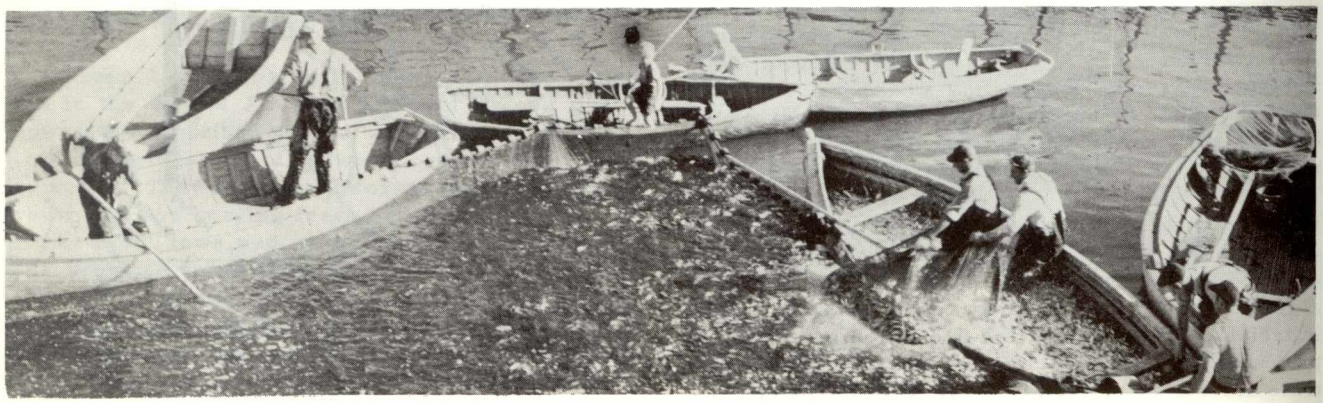


Typical stop seine for herring. In the background note the pocket for removing the catch

have to be increased in size to suit new water levels. The resultant fixed costs are estimated at $129,000.

Wood borer activity is expected to increase. Ice will cause some damage to weir materials during the winter. The annual cost of all weir operations will rise approximately $10,000. It is conceivable that weir owners may discontinue their investments in weirs inside the dams. A shift to alternative methods of fishing could be expected to maintain the fishery, at least at its present level.

The disappearance of some groundfish from inside the dams will result in an annual loss of approximately $3,000. Fish passage facilities for anadromous species were estimated by fisheries engineers to cost $3.0 million. Lobster fishermen are not expected to be adversely affected, but physical damages due to relocation of lobster pounds and refrigeration of water or extension of intake pipes for lobster holding are expected to cost $450,000. Changes in the clam fishery may result in a loss of capital investment in plants valued at $100,000 and an annual loss in primary production of $104,000 for 10 years. ✔



Fisheries Minister J. Angus MacLean addressing the Annual Meeting of the Fisheries Research Board of Canada, January, 1960

The Next Ten Years in Research

F.R.B. Scientists Prepare for Future at Annual Meeting

THE ACHIEVEMENTS that will be demanded in the next ten years in fisheries development in Canada present a great challenge, Fisheries Minister J. Angus MacLean told the Fisheries Research Board of Canada at its annual meeting in Ottawa in January.

Speaking at the opening session of the Board, which is the scientific arm of his Department, Mr. MacLean said it was too early to tell yet whether the 1960's would be the "golden decade" that had been prophesied for Canada, but there was no doubt that there will be many new and as yet undiscovered problems, as well as great opportunities. There will certainly be a tremendous increase in the world's population and as a result, even greater pressures on the resources of the seas.

He noted that the theme for the year's meeting was "The Next Ten Years," including a review of accomplishments of the past decade. He thought that such periodic self appraisal and precise future planning was particularly timely now, when world events are moving so fast and when practically every fishing country is engaged in building new and more modern fleets so that they can better share in the ocean's harvest to help feed their expanding populations. This increase in fishing effort and efficiency on virtually all of the known fishing grounds, including those which Canadian fishermen have come to think of almost as their own, will add not only to the already serious competition experienced by fishermen on the grounds, but can affect Canada's markets as well.

The Minister said it was generally agreed that Canada as a nation would have to improve efficiency in fish production and processing and make increasingly better use of its fish products, if it was to continue to maintain a favourable position against competitors who have a greater need and lower living standards.

Mr. MacLean was happy to learn that the Research Board was giving special attention to the effects of changes in the environment of fishes. The good aspects of these, he said, were the deliber-

ately planned changes, such as improving spawning grounds, fertilizing waters, protection from predators, controlling stream flow, etc. This type of activity brought us closer to being fish husbandmen rather than just fish hunters. He thought it was almost certain that as competition on international fishing grounds continues to increase, the resources which are under our national control and more amenable to fish culture practices will become increasingly important.

Of equal or perhaps of greater immediate importance are the injurious changes occuring in environment, including pollution of inland and coastal waters.

The fact that Canada has many obligations under various international fisheries conventions was also mentioned by the Minister, who said that on many occasions the government has had to call on the Board to carry out part or all of its responsibilities in the fisheries scientific field as far as these obligations are concerned. He expressed satisfaction with the excellent contribution Canada's fisheries scientists are making.

MAIN ACTIVITIES

Mr. MacLean said that the Board has two main functions, the carrying out of pure research and the application of its findings, at least in the pilot plant stage, although in many cases the Board's activity for practical reasons may have to go even further than this.

Mr. MacLean was introduced to the Research Board by its chairman, Dr. J.L. Kask, Ottawa, who also introduced the Deputy Minister of Fisheries, G.R. Clark. Mr. Clark said it was essential for any organization to review its progress from time to time and plan its future. In the next ten years the Canadian fishing industry will face what may be the most critical period in its history in the fields of production, processing and marketing. Mr. Clark said that the Board should keep the practical needs of industry in mind at all times.

In his annual report to the Board, Dr. Kask reviewed the scientific advances and achievements in fisheries research and developments during the past ten years. The changing times and needs are reflected in the Board's work, and the progress made is indicated by the fact that between 1950 and 1960 the permanent staff has been doubled. In the same period almost all the Board's laboratories and other facilities have been renewed, expanded or otherwise improved.

Members of the permanent staff of the Board are located at eight biological and technological establishments, situated at St. John's, Nfld., Halifax, N.S., St. Andrews, N.B., Grande Riviere, Que., Montreal, Que., London, Ont., Vancouver and Nanaimo, B.C.

Shown above are members of the Board and others chatting between sessions of the Board's annual meeting. In the upper photograph, left to right, are Dr. D.B. DeLury, University of Toronto; Prof. E.S. Pretious, University of British Columbia; A.D. Wymbs, Chief Treasury Officer of the Department of Fisheries, and Dr. L. S. Dugal, London, (Ont.) Technological Unit. In the lower picture are A. H. Monroe, St. John's, Nfld.; C. J. Morrow, Lunenburg, N.S.; Gordon O'Brien, Fisheries Council of Canada, and Dr. T.W.M. Cameron, Macdonald College, Que.

In the past few years, new laboratories and facilities have been built at Nanaimo and Vancouver, sizeable new additions have been added to existing buildings at Halifax, St. Andrews and Grande Riviere, and an Arctic Unit has been organized and housed at Montreal. All are provided with the most modern equipment available.

Directors of all stations reported to the Board on activities of the past year and on future programmes, and the Board, with staff members, held

(Continued on page 23)

British Columbia's Shrimp Fishery

By H.A. CAMERON

Small, Efficient Fleet Carries Out Thriving, Year-round Operation

Joe Hirakida aboard "Jan Elaine"

THERE is a touch of romance in one of British Columbia's minor fisheries which is reflected in a popular song of a few years back. The title of the song was, "Shrimp Boats are a'Coming", and the fishery referred to is the shrimp fishery which provides a livelihood for commercial fishermen along the coast of the Gulf of Mexico. On a much smaller scale, but just as thriving, is the shrimp fishery of British Columbia, which has been of increasing importance during the past decade. The 1958 catch of nearly two million pounds was worth $305,000 to fishermen. This is in contrast to 1947 when the catch was worth only $27,527.

The history of the colourful shrimp fishery of the province is at best vague, with only sporadic records kept until recent years. There are indications, however, that a fishery existed near Victoria before 1890, but it wasn't until 1917, when two British Columbia fishermen, William Burroughs and T. Ingram, began trawling for shrimp in Vancouver Harbour, that a regular fishery was established. This was soon to develop into a fleet consisting of nine boats. Between the two world wars, Canadian fishermen of Japanese extraction moved into the shrimp fishery in a big way, dominating the operation in southern areas around Vancouver. During World War II the production of shrimp was very low and it was not until 1946 that the fishery in this area again became active. In 1950, the above-mentioned fishermen re-entered the fishery and up to the present time have conducted the only year-round shrimp operation in British Columbia.

In the northern waters, before 1940, several fishermen worked in Prince Rupert Harbour. In 1939, the late Earl N. Ohmer of Petersburg, Alaska, received permission from the federal Department of Fisheries to prospect for shrimps in the vicinity of Prince Rupert. After a brief survey, he concluded that shrimps were not abundant enough to maintain the operation of a cannery at Prince Rupert. Several attempts were made in the 1930's to establish a shrimp fishery in Masset Inlet at the North end of the Queen Charlotte Islands. In the winter of 1950-51, a successful operation was started in Massett Inlet by Queen Charlotte Canneries; it continued with some interruption through the following winters until 1954.

In recent years, the shrimp fleets have confined their operations primarily to the waters adjacent to Vancouver, the Howe Sound area, and the east coast of Vancouver Island off Courtenay and Ladysmith.

There are five species of shrimps found in British Columbia waters. They include: the "side-stripe" or "Giant-red", the "Pink" shrimp, "Prawn" or "Spot", "Hump-back" or "King" shrimp, and the "Coon-stripe" shrimp. The "Pink", although quite small in size, yields the bulk of the shrimp meat marketed in Vancouver. The "Prawn" is the largest

Catch is hand-brailed from cod end

of the commercial shrimps and is the only species taken in quantity by trap.

The commercial shrimps are fished at moderate depths, ranging from 15 to 70 fathoms. Those species which are generally found on muddy or sandy bottoms are caught by towing a bag-shaped net over the bottom. This method of fishing is called trawling. The trawl net is conical in shape, open at one end and tapering to an apex at the other. As the net is towed along the bottom, shrimps are gathered in the mouth of the net and passed into the apex, or cod end.

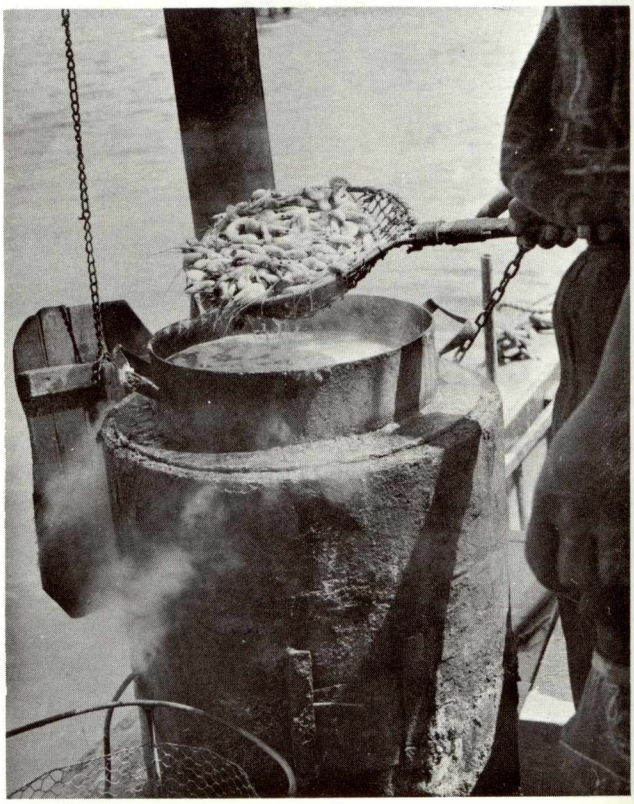
There are two methods of trawling used in the shrimp fishery -- otter trawling and beam trawling. The larger two-man boats (about 40 feet in length) generally use the otter trawl. This method has the upper edge of the mouth of the net supported by glass floats, and the sides of the net are attached to two vane-shaped boards, so that when the gear is towed along the bottom, the resistance of the water causes the boards to spread the mouth of the net open.

However, on the majority of shrimp boats, operated on a one-man basis, the more easily handled beam trawl is preferred by the fisherman.

The "Jan Elaine", owned and operated by Joe Hirakida, a Canadian of Japanese origin, is a typical example of the vessels engaged in this fishery. His boat is a converted gillnetter, 35 feet long, powered by an 85 hp engine with additional steering and power controls at the stern. It also has a power take-off from the main engine to operate the drum and winch. The mast boom is used to hold the towline above and well clear of the stern. The short roof protrudes five feet back from the wheelhouse affording protection from the weather.

There are 14 shrimp boats fishing the waters around Vancouver on a year-round basis. This fleet, which supplies the Vancouver fresh shrimp market, nets the fishermen an average of 15 cents per pound for whole shrimp and a dollar per pound for "shucked" or shelled shrimp. When in operation, the boats average between 140 and 290 pounds a day on two tows lasting from two to three hours.

In order to get a closer look at the shrimp operation, the writer boarded the Jan Elaine as Joe was finishing his first tow of the day. He had been slowly beam trawling back and forth across the Inlet at two knots for the past three hours, and had stopped his boat to gain slack on the 3/4-inch manilla towline. To increase the slack, the boom is lowered by dropping the towline across the centre of the drum on the stern. The boom is then untied from the towing post, thereby taking the strain off the drum, and allowed to lie across the drum. The towline is next wound around the drum by means of the power take-off. The fisherman had his beam trawl 35 fathoms deep extending 120 fathoms astern



Shrimp are boiled aboard vessel

of the boat. As the towline was reeled onto the drum, Joe explained that the beam trawl gear he used was similar to that on other shrimp boats. A bridle consisting of a length of rope running along each side of the net and attached to net spreaders is fastened onto the end of the towline. The 30-foot pole is lashed to the net spreaders in such a way that it forces open the mouth of the net. The net itself lies behind the pole at a distance of a few feet, and has a head line which is buoyed up with glass floats. The sole line or ground line, as it is sometimes called, hangs below the head line and is weighted at either end -- in this case by heavy boom chains.

The secret of successful shrimp fishing is "clean" fishing. This means that the sole line must skip lightly along the sea bottom, stirring up the fish and trapping them in the net without picking up large quantities of mud.

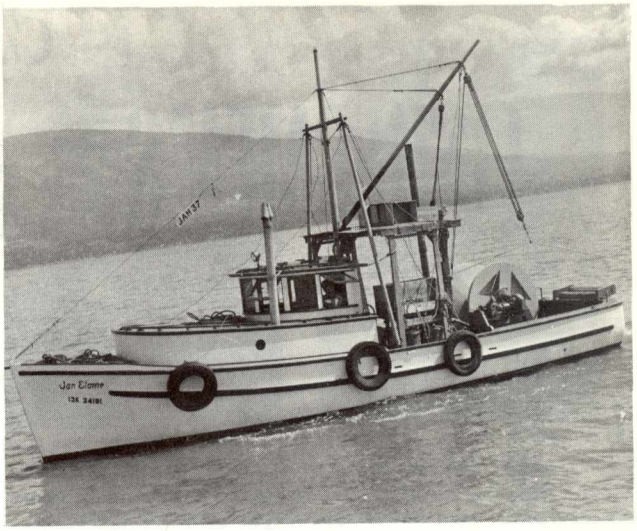
The fishing operation is nearing completion when the bridle ropes appear over the stern. When this happens, one end of the beam pole is freed and taken aboard the boat. As the trawl net, which is usually a 1-1/4-inch mesh or discarded seine web, is brought closer to the stern, upended and run forward, the beam is in a cradle position alongside the wheel house until the other end can be untied. After this is accomplished, the head and sole lines are brought alongside to a point where the sole line is pulled over the gunwales; the cod end of the net, where the shrimp are trapped, is brought to the surface and the contents brailed by hand into a sorting box.

This type of fishing traps several forms of animal life other than shrimp, such as baby octopi, turbot, and other coarse bottom fish. These are immediately removed from the sorting box and returned to the sea.

COOKED ON BOARD

Cooking the shrimp is the next step for the fisherman. Every shrimp boat is equipped with a galvanized sheet metal tank, three to four feet high, filled with salt water, and heated to a boil, using stove oil or propane gas. The shrimp are tightly packed in a wire basket and placed in the tank of boiling salt water for five or six minutes, after which they are immediately cooled in salt water and then dumped in metal containers. The water in the containers is drained, leaving the shrimp in a semi-dry state. This rapid cooling process ensures freshness; the shrimp are stored in the containers until the vessel docks later in the day, at which time they are transferred to a "shucking" plant.

Research on the shrimp fishery has continued intermittently since 1928 when the late Alfreda Berkeley Needler studied the life histories of the commercial shrimps. She identified the early swimming stages, established the sex change in shrimps and determined growth rates. She published her findings in a comprehensive scientific paper entitled "The post-embryonic development of the Common pandalids of British Columbia".



Converted gillnetter fishing shrimp

Prior to 1954 the shrimp resource of the British Columbia coast was largely unexplored and undeveloped, with practically the entire shrimp production derived from several long-established grounds. In an attempt to improve this situation, an extensive shrimp and prawn prospecting programme was carried out by T.H. Butler and H.E.J. Legare of the Fisheries Research Board of Canada's Biological Station, Nanaimo, B. C., from 1953 to 1955, in which several promising grounds were located. ✔

Eskimo Circular

A "circular of enlightenment" is the way biologists of the Fisheries Research Board of Canada describe a publication soon to be issued by the Board's Arctic Unit. Hand-written in both the Eskimo and English languages, and illustrated with descriptive drawings, the circular explains to the Eskimo in his native language the work being done by the Fisheries Research Board to conserve the walrus, as well as pointing out ways the Eskimo can help the Board in this endeavour. For instance, the Eskimo is asked to take a simple census count of the walrus, observing the number of males and females, and also the number of pregnant members of the species.

The circular, the first prepared by the Board in the Eskimo language, can be conveniently carried. R.C.M.P. officers stationed in the north will assist the Arctic Unit when the circular is ready for distribution to the Eskimos.

C.B.C. FISHERMEN'S BROADCASTS

By FRANK NICHOLSON

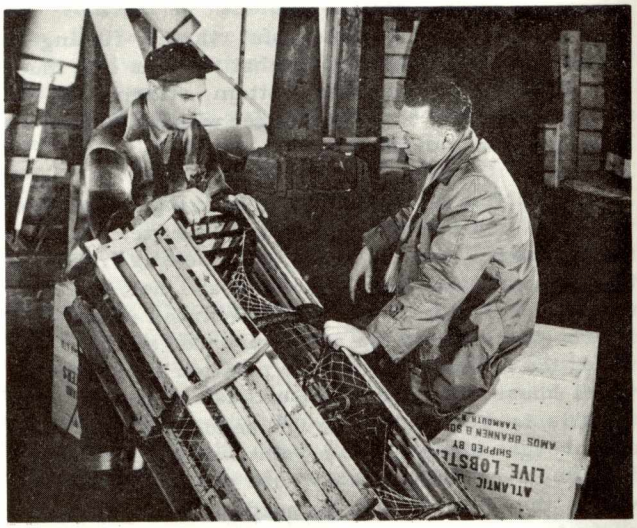
IT'S 6:40 OF A FINE, clear morning on Canada's west coast ... early for landlubbers, but the fisherman's day is already long begun or ending. On the rolling Pacific gill-netters hurrying in from the grounds with their overnight salmon catch pass trollers and purse-seiners deeply engrossed in the day's efforts. Little islands apart, the ships at that moment have one thing in common ... the opening announcement of the day's Fishermen's Broadcast out of Vancouver.

Late afternoon, a continent away, the master of a trawler on the Grand Banks and the skipper of a longliner on the Nova Scotia fishing grounds check their watches, tune their radios and the crew gathers around for the opening announcement of the Fishermen's Broadcast.

This special service of the Canadian Broadcasting Corporation, heard on two coasts and beamed out of three centres, linking fishermen in a variety of crafts and places, is today an indispensable part of the Canadian fishing scene. Begun in 1946 in the Maritimes, it was extended to Newfoundland after Confederation and to British Columbia in 1952, each Broadcast especially designed to suit the particular needs of the fishermen in each area.

Although they differ in news detail, the three Broadcasts conform in overall pattern, bringing fishermen and the industry reports on the weather, market prices, pertinent news on fishing conditions and special discussions from time to time on current fisheries topics.

Because of the relative isolation of the fishing communities, it had been difficult for the fishermen to keep abreast of market developments and the modern production techniques in the fishing industry, so that when the CBC Fishermen's Broadcast was started it became more than just an interesting programme. Fishermen began to rely on the market information, the weather information and information regarding navigational aids and the latest research information. In one particular instance, a fisherman ran into a navy practice area and later was heard to say that the navy shouldn't have been there because it wasn't mentioned on the Fishermen's Broadcast. And speaking of Notices to Mariners supplied by the Department of Transport, the funniest one read "the never-fail gas and whistle buoy is reported not functioning."



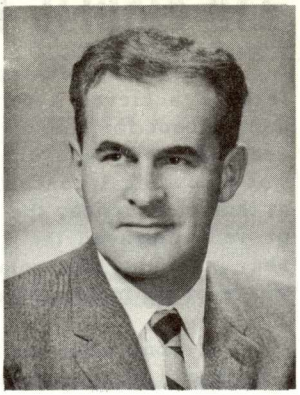
Commentator Mike Gillis (right) chats with Herman Nickerson of Yarmouth Bar, N.S., about the construction of lobster traps.

The CBC Fishermen's Broadcasters, Jack Watts and Rab Carnell in St. John's, Newfoundland, Mike Gillis in Halifax, N.S., and Ron Tarves in Vancouver, B.C., keep closely informed on the latest developments in the fishery. As the result of many broadcasting trips to fishing villages, offshore vessels, research stations and fishery officers they are able to present the kind of programmes which are of both interest and value to fishermen.

A vast source of information and material is necessary to keep a Fishermen's Broadcast going and the Fishermen's Broadcast commentators have received a great deal of co-operation from almost

Mr. Nicholson is located at the Toronto studios of the Canadian Broadcasting Corporation as Producer, National Farm and Fisheries Department.

Jack Watts



Rab Carnell

Ron Tarves

Jack Trower

everyone associated with the fishing industry. The Department of Transport, through its weather bureau, provides detailed weather forecasts and, through its marine division, information on navigational aids, changes in buoys, information on ice conditions, military manoeuvers, etc.

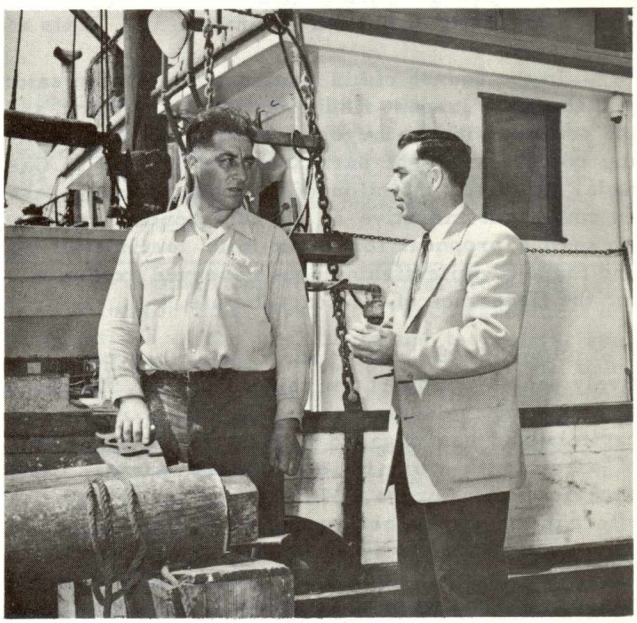
The Department of Fisheries provides a complete market service including landings, prices and information about the industry generally. The various fishery officers of the Department provide a constant flow of information about local conditions in their respective districts. The Fisheries Research Board has also been a constant source of information for the Fishermen's Broadcasts and the U.S. Fish and Wildlife Service provides daily information on markets and research.

In the Atlantic region "Uncle Mose", who lives in Pigeon Inlet, Newfoundland, provides Atlantic fishermen with a weekly bit of philosophy wrapped up in a humorous package.

The listeners to the CBC Fishermen's Broadcasts are kept informed of the latest developments in the fishery both in Canada and elsewhere. Jack Trower, Liaison Officer, Farm & Fisheries Department, Ottawa, maintains close contact with the Department of Fisheries, the Fisheries Council of Canada and other organizations. Information officers with FAO supply information on developments in the fishery from all the countries of the world. Regular reports come from the United Kingdom, Washington and other countries.

The aim of the CBC is to ensure that through Fishermen's Broadcasts, Canadian fishermen will be the best informed of any fishermen in the world.

Television is also playing its part in providing information to fishermen and providing a service for fishermen. Last fall the first regular fishermen's television programme was started in the Maritimes. "Fishermen's Log", with host Mike Gillis, is seen every Saturday night at 6:45 over CBHT, Halifax, and its satellite stations. The first coast to coast television network programme dealing with the fishery will be seen on March 23 at 10:30 p.m. EST. This programme, "The Seventh Wave", deals with the economic crisis that threatens the fishing industry and will attempt to explain to Canada's public some of the major problems facing Canada's fishermen (see page 22).



Commentator Norman Hansen (right) interviews a British Columbia fisherman on the docks at Vancouver.

As for the effectiveness of the Fishermen's Broadcasts, the general reaction among fishermen and the interested public may be summed up in the words of Federal Fisheries Deputy Minister George R. Clark: "I consider that the Fishermen's Broadcasts, for both the Pacific and the Atlantic, are performing a unique and valuable service for our fishermen and the industry as a whole. This service of the CBC is to be highly commended".

THE TERRITORIAL SEA AND FISHING LIMITS

THE IMPORTANCE to Canada of the second United Nations Conference on the Law of the Sea, which is to be held in Geneva this spring, was stressed in the House of Commons on January 15 by the Hon. Howard C. Green, Secretary of State for External Affairs. Mr. Green said: "Canada, together with over 80 member countries of the United Nations and its specialized agencies, will take part in this conference, which is regarded by the Canadian Government as of the utmost importance to the peace of the world and the development of international law."

Mr. Green said the Canadian delegation would be led by the Hon. George Drew, Canadian High Commissioner to the United Kingdom, who headed the Canadian delegation to the first conference in Geneva in 1958. Other delegates will be M.H. Wershof, permanent representative to the European office of the United Nations; Marcel Cadieux, legal adviser and Assistant Under Secretary of State, and S.V. Ozere, Assistant Deputy Minister of the Department of Fisheries. Another delegate will be Professor George Curtis, Dean of the School of Law, University of British Columbia.

In the course of his remarks Mr. Green said: "As the sixth largest fishing nation in the world and the country with the largest coastline, the forthcoming conference is of particular importance to Canada. It is the intention of the Government to take an important initiative at the conference by putting forward a proposal for a six-mile territorial sea and for a 12-mile fishing zone reserved exclusively for the fishermen of the coastal state.

"During the past year Canada has been actively seeking support for this proposal. The Government has held discussions in a large number of capitals and has engaged in a series of exchanges of views with countries in Asia, Africa, Latin America, and Europe. We will continue a vigorous effort in the weeks before the conference and at the conference itself to seek support for this proposal, which we believe is a practicable and workable compromise between the positions of those states, the Soviet bloc and others, on the one hand, which favour a 12-mile territorial sea, and those maritime states, the United Kingdom, the United States and others, on the other hand, which are seeking to preserve a narrow territorial sea and historic fishing rights."

Mr. Green referred to a pamphlet "The Law of the Sea" which the Canadian Government has distributed, explaining the Canadian proposal which, it is thought, seems to offer the best hope of reaching agreement at the conference. The Canadian and other proposals are outlined in the box on the following page.

The pamphlet says that the first Geneva conference achieved a remarkable degree of success and, except for the measurement of the territorial sea and the measurement of a fishing zone, which was a new legal concept advanced for the first time at that conference, the 133 articles which it approved embraced the whole field of the law of the sea, including that relating to the territorial sea, whatever its measurement might be.

A Convention on the Territorial Sea and the Contiguous Zone codifies the rights and obligations of states in their territorial sea. It contains many articles of benefit to coastal states, such as those providing for a 12-mile contiguous zone for custom, fiscal, sanitary and immigration purposes, for a 24-mile closing line for bays, and for the application of the straight base-line system for determining, in certain circumstances, the starting point for measuring the territorial sea. In addition, it recognizes and regulates the right of innocent passage for ships through the territorial sea.

The Convention on the High Seas, proclaiming as its underlying principle the freedom of the high seas, gathers together into a single instrument a wide variety of rules relating to the high seas, including such matters as the nationality of ships, safety of life at sea and the prevention of water pollution. A third Convention, on High Seas Fishing, was designed to maintain the productivity of the living resources of the high seas. It takes a new step forward in developing and applying the principles of conservation to the high seas and in recognizing the special interests of coastal states in the fishing resources in the high seas adjacent to their coasts.

CONTINENTAL SHELF

The Convention on the Continental Shelf is of special importance since it is the first international instrument dealing with this subject. It grants to coastal states sovereign rights over the exploration and exploitation of the natural resources of the sea bed and subsoil of its coast to a depth of 200 metres or to a greater depth if exploitation is possible. An optional protocol provides for the compulsory judicial settlement of disputes.

The Canadian Government's pamphlet says that these instruments may not have achieved the recognition they deserve as important and far-reaching steps forward in Maritime law, because attention had largely been focused on the failure to agree at Geneva on the questions of the breadth of the territorial sea and a coastal state's rights in the contiguous fishing zone.

The agenda at the forthcoming Geneva Conference will be limited to those two items -- territorial sea limits and fishing zones.

Four Positions on the Territorial Sea Question Put Forward During the 1958 Conference on the Law of the Sea

The Canadian Proposal:

"1. A State is entitled to fix the breadth of its territorial sea up to a limit of six nautical miles measured from the baseline which may be applicable in conformity with articles 4 and 5.

"2. A State has a fishing zone contiguous to its territorial sea extending to a limit twelve nautical miles from the baseline from which the breadth of its territorial sea is measured in which it has the same rights in respect of fishing and the exploitation of the living resources of the sea as it has in its territorial sea."

The United States Proposal:

"1. The maximum breadth of the territorial sea of any State shall be six miles.

"2. The coastal State shall in a zone having a maximum breadth of twelve miles, measured from the applicable baseline, determined as provided in these rules, have the same rights in respect of fishing and the exploitation of the living resources of the sea as it has in its territorial sea; provided that such rights shall be subject to the right of the vessels of any State whose vessels have fished regularly in that portion of the zone having a continuous baseline and located in the same major body of water for the period of five years immediately preceding the signature of this convention, to fish in the outer six miles of that portion of the zone, under obligation to observe therein such conservation regulations as are consistent with the rules on fisheries adopted by this conference and other rules of international law.

"3. Any dispute with respect to the interpretation or application of this article shall, at the request of any party to the dispute, be submitted to arbitration unless the parties agree to another method of peaceful solution.

"4. For the purpose of this convention the term 'mile' means a nautical mile (which is 1,852 metres), reckoned at sixty to one degree of latitude.

"5. As respects the parties thereto, the provisions of paragraph 2 of this article shall be subject to such bilateral or multilateral arrangements, if any, as may exist or be entered into."

NOTE: It is proposed that this article be entered into with the express understanding that each party to the convention undertakes to consider sympathetically the request of another party to consult on the question of whether the rights granted by the article are being exercised in such manner as to work an inequity upon one or more of the other parties and, if so, what measures should and can be taken to remedy the situation.

The U.S.S.R. Proposal:

"Each State shall determine the breadth of its territorial waters in accordance with established practice within the limits, as a rule, of three to twelve miles, having regard to historical and geographical conditions, economic interests, the interests of the security of the coastal State and the interests of international navigation."

The Eight-Power (Burma, Colombia, Indonesia, Mexico, Morocco, Saudi Arabia, United Arab Republic and Venezuela) Proposal:

"1. Every State is entitled to fix the breadth of its territorial sea up to a limit of twelve nautical miles measured from the baseline which may be applicable in conformity with articles 4 and 5.

"2. Where the breadth of its territorial sea is less than twelve nautical miles measured as above, a State has a fishing zone contiguous to its territorial sea extending to a limit twelve nautical miles from the baseline from which the breadth of its territorial sea is measured in which it has the same rights in respect of fishing and the exploitation of the living resources of the sea as it has in its territorial sea."

The pamphlet details the position of various countries taken in the past with respect to territorial limits, and explains the problems met at the first Geneva Conference, when a wide variety of proposals was put forward concerning the extent of a coastal state's jurisdiction with respect to fisheries and the territorial sea. The significance of the Canadian proposal to the first Conference was that it distinguished between the questions of fishing in coastal waters and of the breadth of the territorial sea. It was advanced in the belief that it was (as it is now) a genuine compromise formula for recognizing the conflicting positions of those states which desire an extension of the territorial sea to 12 miles or more, and those which seek to restrict any extension of a coastal state's jurisdiction over its adjacent seas.

PRINCIPLES RECOGNIZED

In suggesting a territorial sea of six miles, the Canadian proposal recognizes the concern of all states with the principle of the freedom of the high seas; and, by allowing a state a further six miles of exclusive fisheries jurisdiction, it grants to all coastal states the same measure of control over the economic resources of their adjacent seas as they would have under a 12-mile territorial limit.

The second Conference is likely to be the last opportunity for many years to reach agreement on the questions of the breadth of the territorial sea and of a coastal state's fishing rights. It will thus be presented with a choice between the orderly development of international law and the chaos which could result from a failure to meet this challenge to create new principles for the law of the sea.

After examining in detail the advantages and disadvantages of various proposals, the Canadian Government's pamphlet states that when the possibilities for the success of the next Conference are studied, the unqualified six plus six proposal emerges as the most hopeful. By recognizing in one formula the interests of all coastal states in the freedom of the high seas and in the resources of their adjacent waters, the Canadian solution embraces the basic areas of agreement reached at the first Conference; and since this formula reconciles the position of states seeking to secure an extension of the territorial sea and that of states seeking to restrict coastal jurisdiction, it provides, in the Government's belief, a common ground upon which nations with hitherto opposing views can unite in agreeing upon an equitable and effective solution to the problems facing the Conference.

Canadian Fisheries, May-Dec., 1959

FROM the opening of the fishing year in May 1959 to the end of December, Atlantic fishermen had a good season. Fish were plentiful and markets steady at higher prices than in the previous year. Freezing plants, paying bonus prices for top quality fish, had all the supplies they could handle and at the height of the export season were shipping as fast as they could process and pack. Demand for saltfish also was strong. At December 31 stocks of salted and pickled fish were lower than a year earlier and so were frozen stocks with the exception of cod and haddock fillets and blocks. Although crippling quantities of their gear were destroyed by storms in some parts of the Bay of Fundy, lobstermen increased their overall catch by three million pounds and their gross income by two million dollars. This compares with an increase of five million dollars in gross earnings of ground-fishermen.

The Pacific season was less profitable. It was a low year in salmon cycles but these fish were even scarcer than was anticipated. The canned pack was small and exports to the American fresh fish market declined in value by two million dollars. A general strike of fishermen, tendermen and plant workers suspended operations throughout the industry from July 25 to August 10 and it was the end of August before some plants got back into production. There was no summer herring fishery as that fleet was on strike from the beginning of the season to October 7. Landings were phenomenal from then to the Christmas tie-up, when reduction plants announced they would require no more supplies all winter.

Freshwater fisheries expanded, especially in the prairie provinces. Very heavy stocks had accumulated before the market picked up in the late fall. Demand was then so brisk, however, that by the end of December supplies were half a million pounds below the level of a year earlier.

MARITIMES AND QUEBEC

For fishermen of the Maritime Provinces and Quebec, 1959 was an all-time record year in the long history of their industry. Never before have they landed a catch worth as much as $44 million. Landed weight was not quite as great as in the record year 1956, but unit prices averaged a little higher. Of the annual total value, $36 million was earned in the summer and fall fisheries, which are the subject of this article.

From the beginning of May to the end of September fishing was excellent. A late spring imposed a slow start but by June the fleets were out in force with the addition of a considerable number of

Lobster boat leaving Miminegash, P.E.I. The Atlantic lobster catch was up 3,000,000 pounds

new vessels, especially in the groundfishery, both offshore and inshore. Heavy catches and bustling activity at plants soon more than made up for initial delays. Markets were strong up to the advent of warm weather. Groundfish demand then fell off temporarily but plants continued busy, stockpiling against autumn orders, which proved to be heavy. Demand for lobsters increased as the tourist season reached its height on the Atlantic seaboard. Prices for practically all products were firm and high.

Hopes for a banner season were temporarily dashed when October howled in with gales and heavy seas and the storms continued through November. Little was hoped for December. Its weather reputation is bad and it is only a half-month at best, since the vessels tie up for the holidays at least a week before Christmas. But December 1959 was one of the best fishing months in living memory.

True, it was windy, so windy that small craft could seldom venture out and even for the big bankers fishing was often difficult. But between December 1 and the dates when they tied up to go Christmas shopping, the fishermen put $4 million in their wallets.

For the lobster opening on December 1 in southern Nova Scotia tens of thousands of traps were set by about five thousand lobstermen in nearly three thousand boats. Both there and in southern New Brunswick, which had opened earlier, fishermen rated the month the best lobstering period in many years. Holiday demand was heavy. Thousands of pounds of lobsters packed in dry shavings

were shipped by air to North American cities and even to Belgium. Over a million pounds of oysters were raked, mostly in Prince Edward Island, but there were not enough to fill all the Christmas orders. Record scallop landings from Georges Bank helped to bridge the gap.

December with its seasonally busy shellfish market was, however, only the good ending in eight months of highly successful summer and fall fishing and processing, to which groundfisheries made the greatest contribution in both quantity and value.

Cod and haddock were consistently plentiful on the offshore grounds, where by July the trawlers were joined by smaller draggers, salt-bankers and longliners. A summer run of large cod came into the Gulf of St. Lawrence for the third successive year. Pollock and plaice also yielded good catches in the Gulf. Trap fishermen in Halifax County caught plenty of haddock and pollock. Saltfish landed from the Banks was supplemented by heavy shipments to Nova Scotian plants from Newfoundland. Longliners took so much swordfish that they glutted the market. Then they turned to halibuting and landed more fish and sold it at higher prices than in the previous summer. Only redfish seemed to be scarce until November, when heavy concentrations were found off Labrador.

Scarcity of herring in southern Nova Scotia and of mackerel in all the Maritime Provinces reduced output of the pickling industry; but herring were plentiful on the North Shore and in Fundy for lobster bait, bloaters and canned sardines. The small available supplies of mackerel were in lively demand on the fresh fish markets of Boston and New York. With improved salmon landings, New Brunswick was able to take some advantage of the removal of British import restrictions on frozen salmon.

NEWFOUNDLAND

After being frustrated by scarcity of cod and bait in 1958, by a very late spring in 1959 and by drifting ice floes all through May, Newfoundland fishermen were considerably encouraged when a good run of caplin appeared in June. Cod feed on these fish and abundance of caplin is usually followed by abundance of cod. Such was the case last summer. An excellent cod trap fishery through July and August was followed by a good autumn trawl fishery, squid bait being by that time again in adequate supply. Redfish continued scarce and there was no increase in abundance of haddock but landings of plaice and greysole improved.

Good weather in Labrador contributed further to the increase in saltfish output, which expanded by 46 per cent over 1958, although it did not quite reach the level of 1957. There was no substantial carryover of light salted fish from 1958 and production of this item remained low, with demand strong and offered prices well above the previous year's levels. Demand and prices for heavy salted fish were also higher than in 1958, partly because of a general easing in the foreign exchange situation and partly because of larger orders from Portugal, Italy and Cuba, but mainly because drying plants in Nova Scotia and in Newfoundland continued to compete for supplies of saltbulk.

Output of freezing plants was the heaviest since 1956. The increase was mainly in frozen cod produced on the east and north-east coasts but overall production of frozen haddock, halibut, flounder and greysole also expanded. As frozen stocks had been cleaned out during the previous winter and supply lines had been empty for months when the new season began, demand was at first very strong on the American market, which absorbs most of the output. With the earlier failure of Canadian supplies, however, American buyers had stepped up their orders to Iceland, Norway and Denmark. These supplies were beginning to arrive just when Canadian plants rushed into capacity operation to handle the summer's heavy catches. For a time, consequently, Canadian shipments lagged behind production and at the end of the year stocks of some items remained heavy. Prices had held at profitable levels, however.

Results in the herring fishery were the worst since 1934. Demand for pickled herring far outran production but as most sales were made against contracts concluded earlier there was little increase in average prices. Landings were used mainly for pickled herring and bait. Output of herring meal was nil.

Largely because of the late spring, lobster landings were small. Unit prices rose in response to scarcity, however, and value of the catch declined only four per cent.

The salmon catch continued to increase in quantity and even more in value. Most of it is marketed fresh in Canada, where demand was strong. Now that the United Kingdom has removed import restrictions from this item, Newfoundland exporters hope to move into that market in 1960.

In minor fisheries, the market for pickled turbot was slow; production and stocks of cod liver oil returned to normal; output of fish meal, especially herring meal, and of seal, whale and herring oil declined. Adequate supplies of squid, herring and caplin bait were secured for the winter and spring fisheries.

BRITISH COLUMBIA

British Columbia made a promising start on the summer season and brought the fall herring and chum salmon fisheries to a good close but intervening months had little to recommend them.

The summer market for fresh salmon was strong. It is normally supplied with troll-caught springs and cohoes, while net-caught sockeye, pink and chum salmon go to the canneries. As the troll fishery produced few cohoes, springs were in strong demand and commanded very high prices. Catches of early springs were fair in May and June. Then for a few months fresh salmon was so scarce that chums were diverted to this market. A good run of winter springs appeared in November, however, and even after the deepsea troll fishery closed November 30, profitable catches were taken through December in the inside waters, especially off Victoria.

Sockeye were more plentiful than in any previously recorded low period in their four-year cycle but fishermen could benefit little from this phenomenon since they were called out on strike only a few days after the fish arrived and were not back on the grounds until the best of the fishing (by American vessels) was over.

The coho, pink and chum runs were late to arrive and slow to increase in volume. Pinks were a continuing disappointment and canneries, having missed out on the sockeye, were looking for supplies. Most of the cohoes, first because of their tardiness and then because of the strike, eluded the troll fleet. But they later met the seines and gillnets head-on and the coho pack was the largest since 1951.

Net fleets were out in force in October for the fall run of chums but it proved to be late and small and rough windy weather hampered fishing. This season reopens briefly in a few local areas in late November and early December, a supplementary effort which last year proved surprisingly successful.

The 1959 salmon pack of all species was the smallest since 1944.

PACIFIC HERRING

The herring fleet, after two years of record summer catches, was on strike all summer and up to October 7, when the fishermen settled their price differences with reduction plants. Hecate Strait was too windy for much activity there but "pit-lamping" off Victoria produced such heavy landings through October and November that reduction plants operated at round-the-clock capacity. Fishermen in the Queen Charlotte Islands, although beset by rain and floods, took good catches in December and reported the herring were the largest ever landed there in winter. When the fleets tied up for Christmas, plant warehouses, especially at Steveston, were crammed with meal and oil, there was no sign of improvement in the depressed oil market or the slow meal market and no remaining storage space. Plants therefore announced they would buy no more herring during the winter. Although landed value of their October-December catch had exceeded five million dollars, this was grave Christmas news for the fishermen.

Halibuting, after a rough cold opening in Hecate Strait in May, yielded steady normal landings through the summer but demand was weak and prices low.

Summer trawler operations were destroyed by the strike as it was the end of August by the time processing got back into full swing. Through the autumn results were fair, however, with cod rather more abundant than usual while soles and other flatfish seemed rather scarce.

INLAND

Tardy break-up of ice on the lakes last spring delayed the freshwater fisheries but by the end of August they had produced an unusually heavy catch. Weather was cool and wet on the prairies, hot and humid in the east and in most of the United States, where the fish is marketed. Buying was slowed by the heat and prices were at low levels until mid-autumn. Fishermen tried to make up for the low return by increasing volume of catch. Plants operated at capacity and holdings mounted, especially whitefish, lake trout and filleted mullet in Winnipeg and whitefish, perch and pickerel in the east. Most of the fish in storage had actually been sold before the end of the summer but was shipped only on order. It moved out rapidly in advance of the Jewish holiday season, after which the normal cold-weather demand of the latter part of the year reduced stocks to normal.

Alberta produced whitefish, goldeyes and yellow pickerel, the one product for which there was a steady market all summer. Saskatchewan landed heavy catches of lake trout through the summer and whitefish from its ice-covered lakes in November and December. By that time whitefish prices were the highest in several years. From Manitoba whitefish moved briskly to American smoke houses. Lake Winnipeg's sauger fishery in October was a failure but winter fishing on more northern Manitoba lakes produced fair quantities of both sauger and pickerel. The summer's whitefish and lake trout operations on Great Slave Lake yielded a smaller but, with higher unit prices, more valuable catch than in the previous year. The winter fishery started well on December 1 in spite of rough ice which hampered traffic on the lake. In Ontario high temperatures in the summer and low ones toward the end of the year considerably interfered with fishing. Lake trout stocks seemed to be improving in Lake Superior and whitefish stocks in Lake Ontario. Perch were plentiful in Lake Erie, as were the newer arrivals in that lake, smelts. The industry experimented with substituting trawl-nets for gillnets in smelt operations and rated the tests promising.

Canadian Fisheries News

North Pacific Fur Seal Commission Meets in Moscow

Results of the 1959 scientific programmes carried out at the direction of the North Pacific Fur Seal Commission were reviewed at the Commission's third annual meeting, held in Moscow January 25 to 27 inclusive. The sessions held during the three days were marked by a spirit of co-operation among the four participating delegations from Canada, Japan, the U.S.S.R. and the U.S.A. The Commission was established under the provisions of the 1957 Interim Convention on Conservation of the North Pacific Fur Seals. Its chairman during 1959 was G.R. Clark, Deputy Minister of Fisheries of Canada, who presided at the Moscow meeting. Vice-Chairman was Tomonosuke Shiomi, Member of the Agriculture, Forestry and Fisheries Technical Council of Japan. The other two Commissioners are Aleksander A. Ishkov, Minister of the State Planning Commission of the U.S.S.R. and Arnie J. Suomela, Commissioner of the Fish and Wildlife Service, United States Department of the Interior.

Each Commissioner was accompanied by a group of advisers. Those in attendance from Canada, with Mr. Clark, were Dr. W.M. Sprules, Special Assistant to the Deputy Minister; Dr. H.D. Fisher, G.C. Pike and Dr. W.E. Ricker, of the Fisheries Research Board of Canada.

The major responsibility of the Commission is the investigation of the fur seal resources of the North Pacific Ocean, in order to determine the measures which will make possible the maximum sustainable yield from these resources, with due regard for their relation to the productivity of other living marine resources of the area.

RESEARCH PROGRAMME

In accordance with plans developed by the Commission at its first and second meetings, research agencies of the four governments have a co-ordinated programme of research at sea. United States scientists also carry on research on the breeding grounds of the Pribilof Islands in the Eastern Bering Sea, and Soviet scientists do similar work on the Commander Islands in the Western Bering Sea and on Robben Island in the Sea of Okhotsk. The investigations are concentrated on dynamics of the fur seal populations, distribution and migration at sea, feeding habits, and harvesting methods.

In the course of its deliberations in Moscow, the Commission, in reviewing the programme of the past year, particularly noted the favourable growth of the Robben and Kommondorski herds and the progress being made on the Pribilof herd management programme introduced in 1957 to develop the maximum sustainable yield from that herd. The 1959 research work revealed that tagged seals from the Pribilof Islands had been found on the Commander Islands, and a few others had even travelled as far afield as Robben Island, west of Sakhalin. The Commission approved a co-ordinated plan for research during the 1960 season, with investigations at sea to begin in early February on both sides of the Pacific. Investigations at the rookeries will begin in the early summer as the seals arrive at the end of their annual migration to the breeding grounds.

Under the provisions of the Interim Convention, commercial harvesting of seals at sea is prohibited. All harvesting is done on the breeding grounds under the control of the United States on the Pribilof Islands, and under the control of the Soviet Government on Robben Island and the Commander Islands.

The Japanese Commissioner, Mr. Shiomi, was elected Chairman of the Commission to serve through the next annual meeting, and Mr. Ishkov, the U.S.S.R. Commissioner, was elected Vice-Chairman.

Canada's Share

Under the Interim Convention on Conservation of the North Pacific Fur Seals, 15 per cent of the sealskins taken by the U.S.A. in the controlled catch on the Pribilof Islands are delivered to Canada, and another 15 per cent to Japan. In addition, provided that certain conditions specified in the Convention are met, Canada and Japan each receive 15 per cent of the skins taken by the U.S.S.R. on Robben Island and the Commander Islands.

The skins received by Canada are sold at auctions held in Montreal. At the last such sale, on February 1, part of the Canadian allotment for 1959 was sold at an average price, for good quality, of a little more than $103 per skin. Top price was $158. In this particular auction, 3,900 skins were offered. Most were from the Pribilofs, although 130 were from Robben Island and the Commander Islands.

The balance of Canada's share of the 1959 catch will be sold at future auctions.

Study of Mesh Sizes

Atlantic Coast groundfish scientists are studying the immediate and long-term effects of mesh sizes from four inches to six inches on the various fisheries for cod, haddock, redfish, and other bottom fishes in the Northwest Atlantic area. This study was requested by the International Commission for the Northwest Atlantic Fisheries (ICNAF), of which Canada is a member. Other member countries are the United States, United Kingdom, Portugal, France, Denmark, Iceland, Spain, Norway, Italy, West Germany and the U.S.S.R.

International (ICNAF) regulation of groundfish is limited, at present, to cod and haddock, and to the southern part of the Convention area. The minimum-mesh size is $4\frac{1}{2}$ inches on New England and Nova Scotia grounds and in the Gulf of St. Lawrence. It is four inches in the Newfoundland area.

Under a different international agreement, European vessels are required to use a minimum mesh size of 4 1/3 inches for all groundfish dragging in northern waters, from Barents Sea to Greenland.

The scientists have also been asked to explore other conservation measures, such as minimum size limits of fish, closed areas, and closed seasons.

All pertinent information on division of stocks, distribution of fish by sizes, growth rates, death rates, fishing intensities, landing, and discards of small fish are being assembled by groundfish scientists in Commission countries.

During a meeting of scientists at St. Andrews, N.B., Canada, in December 1959, progress with this assessment work was reported, and details of the winter programme were arranged.

In March 1960, a small group of experts from the United Kingdom, Norway, Canada, and the United States will meet in Lowestoft, England, to digest the results of regional studies. They will prepare a report for consideration by scientists and Commissioners at the next meeting of ICNAF at Bergen, Norway, next May.

Atlantic Fisheries on TV

During the past 25 years, probably no other industry has faced greater challenges of adjustment than Canada's fishing industry. In a filmed documentary programme "The Seventh Wave", the C.B.C. explores this situation, with particular reference to the Atlantic Fishery. The programme will be carried on the full Trans-Canada T.V. Network at 10:30 p.m. E.S.T., March 23.

Host Ken Homer takes the viewer on a tour of the Maritime fisheries, ranging from Soviet factory ships on the Banks to the lobster fishery at Cross Island off Lunenburg. The programme begins with the competition for fish on the banks, where foreign trawler operations are contrasted with our own. W.S. Lee, General Manager of Maritime Sea Products, tells of the competition for fish on the Banks and for markets in the United States. The camera follows the fish through a fillet plant and sees it being inspected by an officer of the federal Department of Fisheries.

Next we go back to the days of the schooner, pointing out the changes since their hey-day, leading to their practical extinction as commercial fishing craft. We visit with an old skipper, Captain "Deep water" Dan Rompkie, and Willoughby Ritcey, as they watch a schooner unload salt fish at Riverport, N.S., and briefly tour a modern salt fish curing plant. Mr. Ritcey gives his comments on the salt fish market and the problem of supplying it with fish now that the schooner is passing out of the picture. The salt fish trade is now quite dependent on the Newfoundland trap fishery for its supplies of salt fish.

We see the new Fisheries Research Board Vessel "A.T. Cameron" at sea and go aboard for an interview with Dr. W. Templeman of the biological station at St. John's. He deals with the research and conservation side of the offshore fishery as well as with international co-operation through ICNAF. Earl Smith, a fisherman from Cross Island, tells of the life of a lobster fisherman, and his wife comments on her feelings as a fisherman's wife. Howard MacKichan, General Manager of United Maritime Fishermen, describes the work of the co-operatives along the Atlantic coast with particular reference to Port Bickerton, on the eastern shore of Nova Scotia. Charlie Kaiser, of that town, explains how the fishermen, through their own initiative, built a half-million dollar plant to process and market fresh and frozen fish, and equipped themselves with a fleet of $35,000 long liners for year-round fishing. The camera is taken out on one of these long-liners to show actual operations, and another fisherman, Roy Jack, talks of the not-so-bright side of winter fishing and his concern about the scarcity of fish.

Host Ken Homer then deals with work being done to help the fisherman and what he is doing for himself to better his position. This includes work of the Department of Fisheries and the Fisheries Research Board, as exemplified in one field by the jet-type clam digger.

Finally, several of the men seen earlier in the film give their opinions as to the future of the industry, and the programme is concluded by Mr. Homer's summation of the situation as he outlines the challenge of "The Seventh Wave".

Oyster Harvester

A mechanical method of harvesting oysters as an alternative to the traditional use of tongs and drags, has been developed by the Fisheries Research Board of Canada and the Industrial Development Service of the federal Department of Fisheries. An "escalator" harvester originally developed for fishing clams and quahaugs, fitted to the Board's research vessel "Cyprina", and operating from the Biological Station at St. Andrews, N.B., was modified so that it could fish oysters.

This harvester utilizes powerful water jets to wash shellfish into a scoop and onto a conveyor belt which carries them to the surface. With burrowing shellfish like clams and quahaugs the scoop must dig into the sea bottom. The oyster, however, is a surface dweller and it is best not to disturb the bottom when it is fished. The scoop was therefore equipped with rubber-tired wheels to prevent it from digging into the soil. The water jet system was also changed so that it could lift oysters off the bottom without disturbing the soil.

Fishing efficiency trials were conducted at Conway Narrows, off Malpeque Bay, Prince Edward Island, and were studied by "skin divers" whose observations enabled the investigators to perfect the machine to a point where it captured virtually all the oysters in its path. It disturbed the bottom so little that the only means of discovering where fishing had been done was to look for places where there were no oysters.

In experiments on bottom where the densities of oysters were about one per three square feet, the machine travelled 150 feet per minute and gathered oysters at the rate of about one bushel per minute, with three men tending the escalator belt. In fishing quahaugs the machine must dig into the bottom and travels at only 50 feet per minute. This versatile device holds promise of usefulness in various oyster culture operations as well as in harvesting. Tests are to be made in cleaning oyster beds of trash such as dead shell, and in gathering shells to be used for catching seed oysters.

RESEARCH BOARD MEETING . . .

(Continued from page 10)

a series of round-table discussions with a view to establishing policy and priorities for the next ten years.

The role of the engineer in fisheries research was one of the subjects discussed by Board members and directors of the Board's Biological and Technological Stations. Factors affecting the environment of fishes were also considered. These covered a wide range, including various conservation measures and such threats to fisheries as pollution, power development and deforestation.

Representatives of the fishing industry as well as scientists expressed opinions on the improvement of communication between research and industry, a subject of special importance in this connection, because in fisheries matters practically all research activities are conducted by governmental agencies. The fourth topic of discussion was fishing efficiency. It was agreed that rapid development in Canada of improved gear and catching methods was made imperative by the increasing competition from other countries on international fishing grounds off both the Atlantic and Pacific coasts.

Meetings of the Board's Biological and Technological Committees were held in conjunction with the annual meeting, and, following custom, the Board sponsored a meeting -- the 13th -- of the Canadian Committee on Freshwater Fisheries Research, which was attended by fishery biologists and technologists from various parts of Canada.

MEMBERSHIP

The Research Board is made up of 17 members in addition to its full-time chairman, Dr. Kask. Nine of the members are university scientists, seven represent industry, and one represents the federal Department of Fisheries. They serve without pay for five-year terms.

The Board members are: Dr. J.M.R. Beveridge, Queen's University, Kingston, Ont.; Dr. T.W.M. Cameron, Macdonald College, Quebec; Dr. I. McT. Cowan, University of British Columbia, Vancouver; Dr. D.B. DeLury, University of Toronto; C.E. Desourdy, Montreal; Martin K. Eriksen, Prince Rupert, B.C.; Dr. Paul E. Gagnon, Laval University, Quebec; Dr. F. R. Hayes, Dalhousie University, Halifax, N.S.; D. F. Miller, Vancouver, B.C., C.J. Morrow, Lunenburg, N.S.; Arthur H. Monroe, St. John's, Nfld.; Leonard R. Omstead, Wheatley, Ont.; Dr. Lucien Piche, University of Montreal; Prof. E.S. Pretious, University of British Columbia, Vancouver; Dr. A.L. Pritchard, Director, Conservation and Development Service, Department of Fisheries, Ottawa; Dr. D. S. Rawson, University of Saskatchewan, and W.L. Williamson, St. Andrews, N.B.

Deputy Minister of Fisheries G.R. Clark and A.D. Wymbs, Chief Treasury Officer of the Department of Fisheries and Honorary Treasurer of the Board, serve as ex-officio members of the Board's executive committee.

The 1959 summer catch of belugas, or white whales, in Hudson Bay was 268, as compared with 400 in 1958. The belugas were taken for processing at a factory in Churchill, Manitoba. The reason for the reduced catch was the fact that fewer Eskimo and Indian hunters took part in the operation than in previous years.

Fishery Figures For December

SEAFISH: LANDED WEIGHT AND LANDED VALUE

	May - Dec. 1958		May - Dec. 1959	
	'000 lbs	$'000	'000 lbs	$'000
CANADA - TOTAL	1,594,843	88,702	1,664,526	80,106
ATLANTIC COAST - Total	1,032,657	41,423	1,185,125	49,282
Cod	467,882	11,337	604,000	16,082
Haddock	48,556	2,024	50,043	2,146
Pollock, Hake & Cusk	71,148	1,275	68,159	1,310
Rosefish	57,424	1,382	39,357	947
Halibut	4,121	1,080	4,319	1,094
Plaice & Other Flatfish	71,639	2,272	83,356	2,625
Herring & Sardines	195,402	2,579	220,578	3,151
Mackerel	15,437	803	9,293	595
Swordfish	5,377	1,439	6,702	1,384
Salmon	3,443	1,208	3,884	1,410
Smelts	2,578	381	2,140	281
Alewives	8,736	122	10,968	167
Other Fish	30,112	502	19,721	374
Lobsters	39,001	13,456	42,335	15,301
Clams & Quahaugs	4,401	208	5,147	228
Scallops	2,670	1,002	4,260	1,560
Other Shellfish	4,730	353	10,863	627
PACIFIC COAST - Total	562,186	47,279	479,401	30,824
Pacific Cods	6,803	463	7,528	555
Halibut	22,264	4,603	21,999	4,067
Soles & Other Flatfish	5,590	285	5,144	194
Herring	343,790	5,692	332,123	5,501
Salmon	174,743	35,558	103,390	19,753
Other Fish	2,203	67	1,520	139
Shellfish	6,793	611	7,697	615
BY PROVINCES				
British Columbia	562,186	47,279	479,401	30,824
Nova Scotia	364,974	18,149	336,691	19,981
New Brunswick	148,988	6,841	213,034	8,044
Prince Edward Island	37,116	3,516	41,040	4,101
Quebec	98,698	3,400	103,014	3,785
Newfoundland	382,881	9,517	491,346	13,371

MID-MONTH WHOLESALE PRICES, Dec. 1959

		Montreal	Toronto
		$	$
Cod fillets, Atl. fresh, unwrapped	lb	.319	.368
Cod fillets, Atl. frozen, cello 5's	lb	.267	.317
Cod fillets, smoked	lb	.360	.398
Haddock fillets, fresh, unwrapped	lb	.434	.482
Herring kippered, Atl.	lb	.257	.297
Mackerel, frozen, round	lb	.252	.268
Lobsters, canned, Fancy	case 48-½s	42.18	44.20
Sardines, canned	case 100-¼s	9.04	8.95
Halibut, frozen, dressed	lb	.370	.388
Silverbright, frozen, dr.	lb	.418	.428
Coho, frozen, dressed	lb	.638	.638
Sockeye, canned, gr. A	case 48-½s	25.28	25.12
Pink, canned, gr. A	case 48-½s	13.80	13.90
Whitefish, fresh	lb	.354	.327
Lake Trout, frozen	lb	.420	.415

PRICES PER CWT. PAID TO FISHERMEN

(Week ending Dec. 19th)

	1958	1959
	$	$
Halifax		
Cod Steak	4.00	3.75
Market Cod	4.00	3.50
Haddock	6.00	5.00
Plaice	3.50	3.25
Yarmouth		
Haddock	8.00	7.00
Black's Harbour		
Sardines	-	2.00
St. John's, Nfld.		
Cod	2.25	2.25
Haddock (round)	2.00	2.25
Rosefish	-	-
Vancouver		
Ling Cod	12.00	14.00
Grey Cod	4.00-5.00	5.00- 7.00
Soles	6.00-8.00	6.00- 9.00
Salmon(Rdspg.)	35.00	38.00-60.00

Fishery Figures For December

STOCKS AS AT END OF DECEMBER

		1958	1959
		'000 lbs	'000 lbs
TOTAL - Frozen Fish, Canada		56,650	61,044
Frozen-Fresh, Sea Fish - Total		38,076	42,662
Cod, Atlantic, fillets & blocks		2,982	12,215
Haddock, fillets & blocks		1,779	5,388
Rosefish, fillets & blocks		2,184	1,383
Flatfish (excl. Halibut), fillets & blocks		3,024	2,525
Halibut Pacific, dressed & steaks		7,308	6,034
Other Groundfish, dressed & steaks		2,387	2,221
Other Groundfish, fillets & blocks		1,921	2,710
Salmon Pacific, dressed & steaks		9,945	4,607
Herring Atlantic & Pacific		2,211	351
All Other Sea Fish, all forms		3,230	3,547
Shellfish		1,105	1,681
Frozen - Fresh, Inland Fish - Total		7,790	7,336
Perch, round or dressed		631	284
Pickerel (Yellow), fillets		226	318
Sauger, round or dressed		159	249
Tullibee, round or dressed		404	231
Whitefish, round or dressed		1,214	1,566
Whitefish, fillets		1,027	720
Other, all forms		4,129	3,968
Frozen - Smoked Fish - Total		1,465	1,915
Cod Atlantic		485	1,320
Sea Herring, kippers		713	298
Other, all forms		267	297
Frozen for Bait and Animal Feed		9,319	9,131
Salted and Pickled Fish, Atl. Coast			
Wet-salted - Total		28,726	20,482
Cod		19,195	17,778
Other		9,531	2,704
Dried - Total		20,331	17,770
Cod		18,728	17,164
Other		1,603	606
Boneless - Total		723	515
Cod		601	486
Other		122	29
Pickled - Total	(barrels)	24,405	7,060
Herring	"	7,567	2,946
Mackerel	"	6,203	(1)
Alewives	"	10,529	3,781
Turbot	"	106	333
Bloaters	(18 lb. boxes)	160,147	18,890
Boneless Herring	(10 lb. boxes)	5,408	3,113

(1) Only one firm reporting.

CANADIAN EXPORT VALUE OF FISHERY PRODUCTS, MAY-NOVEMBER

(Value in Thousands of Dollars)

	1958	1959
Total Exports	105,486	94,732
By Markets:		
United States	69,257	66,823
Caribbean Area	9,147	9,116
Europe	25,194	16,868
Other Countries	1,888	1,925
By Forms:		
Fresh and Frozen	60,709	59,745
Whole or Dressed	24,588	22,707
Salmon, Pacific	7,988	5,585
Halibut, Pacific	3,069	3,102
Cod, Haddock, Pollock, etc.	470	365
Swordfish	1,762	2,125
Other Seafish	2,833	2,971
Whitefish	3,221	3,532
Pickerel	1,791	1,833
Other Freshwater fish, n.o.p.	3,454	3,194
Fillets	23,882	23,716
Cod, Atlantic	9,618	9,790
Haddock	2,024	2,926
Rosefish, Hake, Pollock, etc.	2,604	1,823
Flatfish	3,701	3,790
Pickerel	1,878	1,408
Other	4,057	3,979
Shellfish	12,239	13,322
Lobster (Alive & Meat)	11,037	11,933
Other	1,202	1,389
Cured	12,653	11,964
Smoked	871	786
Herring	608	519
Other	263	267
Salted, Wet & Dried	9,999	9,720
Cod	8,659	7,911
Other	1,340	1,809
Pickled	1,783	1,458
Herring	969	800
Mackerel	294	184
Other	520	474
Canned	27,335	16,452
Salmon, Pacific	23,979	12,631
Sardines	1,515	1,750
Lobster	1,585	1,700
Other	256	371
Miscellaneous	4,789	6,571
Meal	1,817	3,602
Oil	568	723
Other	2,404	2,246

Iceland

EXPORTS OF PRINCIPAL FISHERY PRODUCTS

January - September, 1959

(For Comparative table, see "Trade News", Dec. 1958)

Quantities in Thousands of Pounds — Value in Thousands of Kroner

DESTINATION	TOTAL EXPORTS		MAINLY COD						HERRING		FISH MEAL	OILS		OTHER PROD.
	Quan.	Value	Fresh	Frozen	Dry Salted	Wet Salted	Stock-fish	Other Types	Frozen	Salted		Cod	Other	(1)
	th.lb.	th.kr.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.	th.lb.
U.S.A.	39,737	113,030	-	35,745	-	326	-	168	-	48	584	1,446	-	1,420
Other Western Hemisphere														
Brazil	2,253	6,308	-	-	2,253	-	-	-	-	-	-	-	-	-
Cuba	2,546	7,700	-	-	2,513	-	-	-	-	-	-	33	-	-
Jamaica	2,192	5,572	-	-	2,183	-	-	9	-	-	-	-	-	-
Panama	443	1,400	-	-	443	-	-	-	-	-	-	-	-	-
Venezuela	214	715	-	-	214	-	-	-	-	-	-	-	-	-
Europe														
Austria	35	70	-	-	-	-	-	-	-	-	33	-	-	2
Belgium	4	11	-	-	-	-	-	-	-	-	-	2	-	2
Cyprus	187	251	-	-	-	-	-	-	-	-	187	-	-	-
Czechoslovakia	23,306	53,321	-	12,710	-	-	-	-	3,316	-	5,518	1,561	-	201
Denmark	16,379	18,520	-	-	-	-	187	-	-	44	14,219	430	-	1,499
Finland	7,161	14,739	-	22	-	-	-	-	-	5,121	67	547	1,360	44
France	9,335	13,877	-	1,545	-	-	-	-	-	-	4,449	-	-	3,341
Germany East	21,541	41,687	-	10,150	-	-	-	-	5,796	1,715	3,880	-	-	-
Germany West	17,901	18,189	6,960	-	Ø	55	141	329	-	13	8,275	179	560	1,389
Greece	2,593	4,309	-	-	-	1,603	-	-	-	2	-	9	-	979
Hungary	997	1,226	-	-	-	-	-	-	331	-	666	-	-	-
Ireland	851	1,091	-	-	-	-	-	-	-	-	851	-	-	
Italy	7,350	14,540	-	4	49	5,844	410	1,025	-	-	-	18	-	-
Netherlands	10,219	16,297	-	1,334	-	-	-	-	-	-	117	7,538	-	1,230
Norway	14,669	19,609	-	-	-	-	-	-	-	-	-	4,217	10,313	139
Poland	9,569	13,412	-	-	-	-	-	-	1,413	4,409	3,307	440	-	-
Portugal	19,769	35,650	-	-	-	19,769	-	-	-	-	-	-	-	-
Spain	4,367	12,788	-	-	2,251	-	348	-	-	-	-	712	593	463
Sweden	41,158	52,459	-	364	-	57	-	7	-	8,256	22,538	82	-	9,854
Switzerland	Ø	11	-	-	-	-	-	-	-	-	-	-	-	Ø
United Kingdom	32,461	55,679	4,475	1,521	7	5,800	2,544	-	-	-	11,228	708	-	6,178
U.S.S.R.	66,841	146,421	-	52,628	-	-	-	-	-	14,213	-	-	-	-
Yugoslavia	4	8	-	-	-	-	-	-	-	-	-	4	-	-
Other Countries														
Australia	2	10	-	-	-	-	2	-	-	-	-	-	-	-
Egypt	66	133	-	-	-	-	-	-	-	-	-	66	-	-
Faroes	2	3	-	-	-	-	-	-	2	-	-	-	-	-
Hong Kong	9	18	-	-	-	-	-	-	-	-	-	9	-	-
Israel	1,104	1,363	-	-	2	-	-	-	-	-	1,102	-	-	-
Kenya	9	20	-	-	-	-	-	-	-	-	-	9	-	-
Nigeria	7,718	33,252	-	-	35	-	7,683	-	-	-	-	-	-	-
Total Jan.-Sept. '59	362,992	703,689	11,435	116,023	9,950	33,454	11,315	1,538	10,858	33,821	77,021	18,010	12,826	26,741
Total Jan.-Sept. '58	394,064	722,392	13,457	108,581	11,393	41,220	6,741	4,241	12,166	38,541	94,669	17,605	18,995	26,455

(1) Includes all whale products which totalled in Jan.-Sept. 1959, 6,597 thousand pounds and in the first nine months of 1958, 12,019 thousand pounds.

(Ø) Represents quantities less than 500 lbs.

Current Reading

"The Herring Fishery of the Northwest Atlantic," by Leslie W. Scattergood and S.N. Tibbo, (The Fisheries Research Board of Canada. For Sale by the Queen's Printer, Ottawa, Canada. $0.75).

This is a general account of the history of the Northwest Atlantic fishery for herring (Clupea harengus L.) from aboriginal days to the present. The average catch during the past three decades has been 142,000 metric tons annually (313 million lb). About half the catch is made on the Maine coast and in the Bay of Fundy; the Canadian Atlantic and the Gulf of St. Lawrence regions yield almost all of the remainder. The size of the catch seldom reflects the availability of the species in the fishing areas. Expansion of the fishery depends upon increased demand accompanied by a price that will make the fishery profitable. Offshore herring stocks, yet unfished, can be harvested, and new and better types of gear can be developed to yield greater catches.

The sea herring is one of the most abundant and important fishes in the North Atlantic. In Europe, the largest fisheries are in the Norwegian and North Seas, but the species is taken commercially as far south as the Strait of Gibraltar. There are herring fisheries in Greenland, Iceland, and in the Arctic Ocean as far east as Siberia. In North America, herring are caught on the Atlantic shores from Labrador to Virginia; the principal fisheries are north of Cape Cod. In the western Atlantic, most of the herring are caught along the coasts; there are no offshore fisheries comparable to those of Europe.

In general, the North American herring fisheries are a series of localized operations of interest primarily to local fishermen and processors; however, in one important area, the fishery is of mutual concern to both Canada and the United States. Here, in a large region that includes the coasts of southern New Brunswick and all of Maine, the Canadian and United States processors of canned immature herring often depend upon a common supply of small herring or "sardines."

No general summary such as this, which reviews the history of the herring fishery on the eastern shores of North America, with particular reference to its present status, has been made previously. Not a great deal is known of the aboriginal fisheries on this continent prior to the visits of European fishermen about 450 years ago. The Indians had weirs, and herring as well as other shore fisheries were probably taken in these rather simple forms of stationary gear. Fortunately, much information on the early history of the western Atlantic herring fishery can be inferred through the study of the somewhat better documented cod fishery, because herring was one of the principal baits for the longlines and handlines that were used during the early cod fishery.

The eastern North American herring fishery, though never attaining the importance of that in Europe, played a definite role in the early economy of the coast areas of New England and the Maritime Provinces. Two historically recent developments have led to an increased use of herring. One was the canning of young herring as sardines, which began in Maine in the 1870's, and the other was the expansion and intensification of lobster fishing in both Canada and the United States after the 1860's, which called for large quantities of bait.

This booklet gives the history of the fishery, describes the catch and its seasonal nature, the gear used, the utilization of the catch, and the possibility for expansion.

"Co-operation Among Fishermen in Norway," by Arne Nordset and Aslak Aasbo, (Directorate of Fisheries, Bergen, Norway).

This book consists of two documents. The first, a paper by Mr. Nordset, is entitled, "Business Organization and Management of Fishery Co-operatives in Norway." The second, by Mr. Aasbo, is "A General Survey of the Development of Co-operatives among Fishermen in Norway and Methods by which the Government has assisted the Organizations."

In the first paper the term "fishery co-operatives" is dealt with in a wide sense. It includes many kinds of organized business where the aim is to increase productivity and profitability for the common benefit of fishermen. The author deals with the general characteristics of fishery industries in Norway, the development and types of fishery co-operatives, and their organization and management. The activities of the co-operatives are assessed in relation to the circumstances prevailing in the localities concerned, to the conditions in the industry, and to government policy in general.

The second section of the book points out that for many years fishermen have been obliged to work jointly to a greater extent than those engaged in many other trades, but this co-operation was restricted to the actual activity of fishing. The subjects outlined here are fishermen's trade organizations, the "lot system" of settlement of accounts, marketing controls and the organizations founded by fishermen to further their interests in this field.

E. R. Clark
Deputy Minister.

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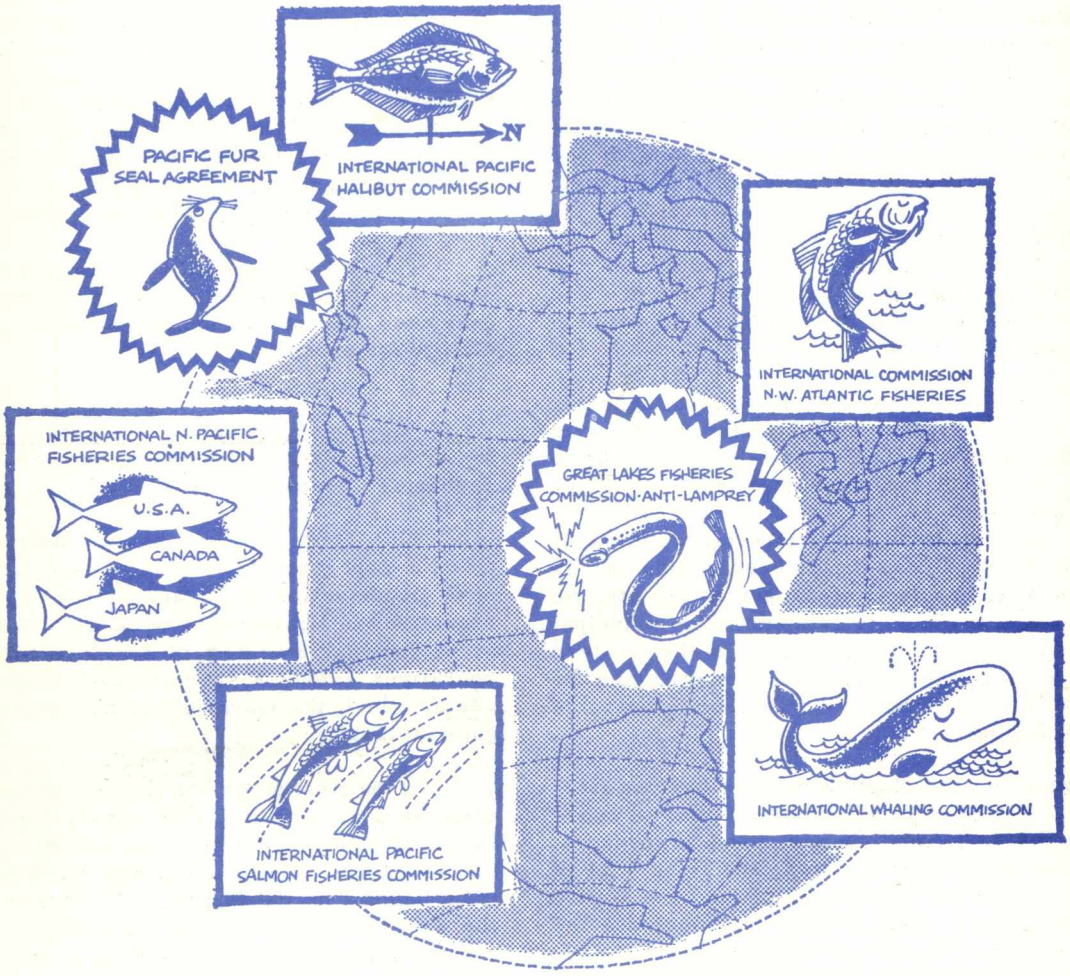

INTERNATIONAL CO-OPERATION

means wise use of fishery resources

Canada has been a pioneer in the establishment of international commissions, the aims of which are to conserve and develop stocks of fish, sustaining their productive level whenever this is threatened by natural and human causes.

This country is a party to three bilateral fishery agreements with our neighbor to the south, and is also a member of four international conventions which include other countries in addition to the United States.

Fish populations renew themselves if given the chance. The purpose of international co-operation is to make sure that they *are* given this chance . . . through practical programmes of scientific research and by common sense fisheries regulations.

The Queen's Printer and Controller of Stationery, Ottawa, 1960