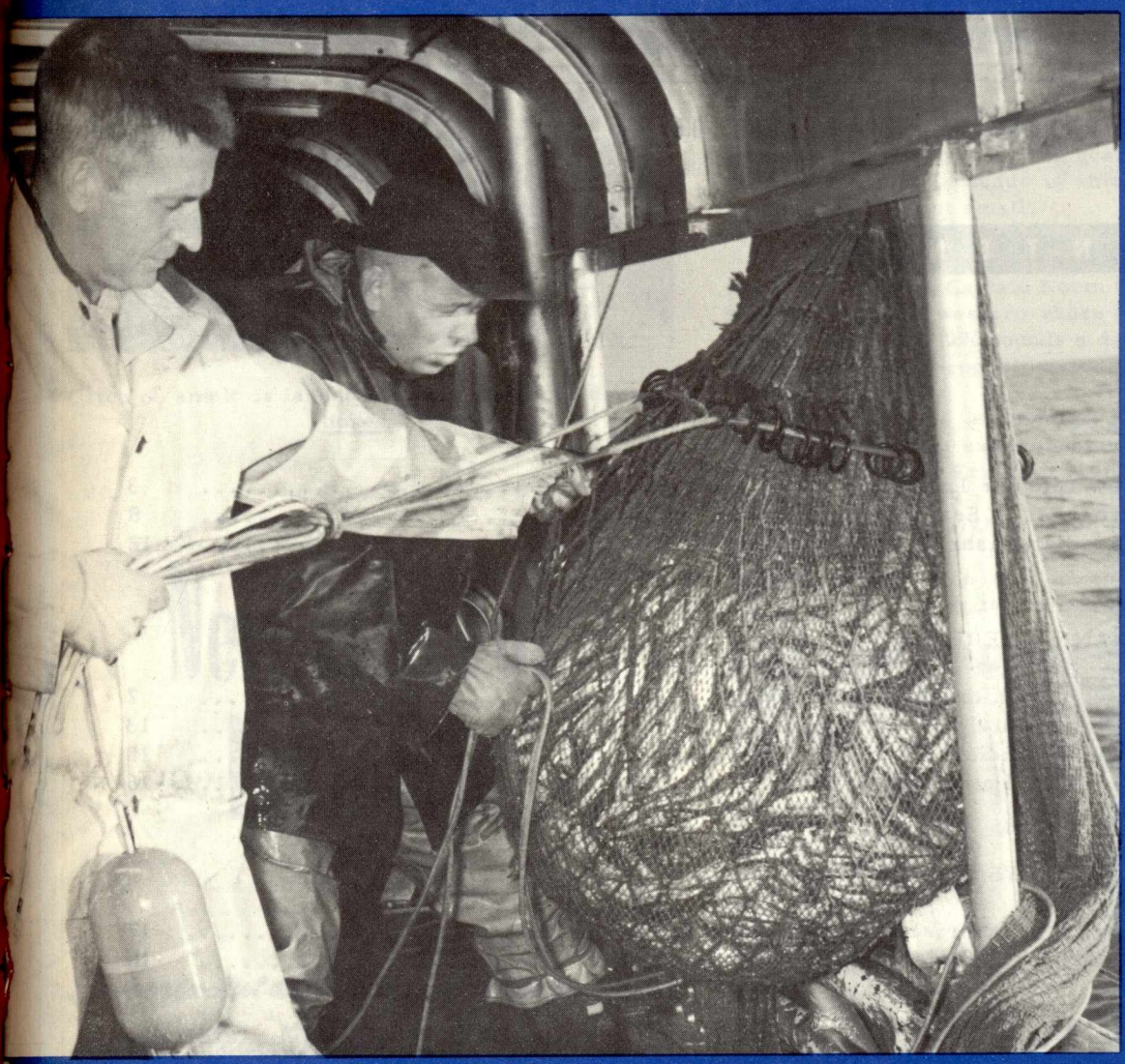
Trade News



January, 1960

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Trade News

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VOL. 12 NO. 7

FEATURES

CANADIAN FISHERIES NEWS

FISHERIES NEWS FROM ABROAD

COVER PHOTOGRAPH: An hour's drag produced this bag of smelt in experimental mid-water trawling programme on Lake Erie. Story on page 3.

Catch of smelt is landed on deck, then iced down in boxes.

New Life For Lake Erie

Experimental Fishing Programme Seeks New Ways to Harvest Erie's Blooming Smelt Stocks

By MARK RONAYNE

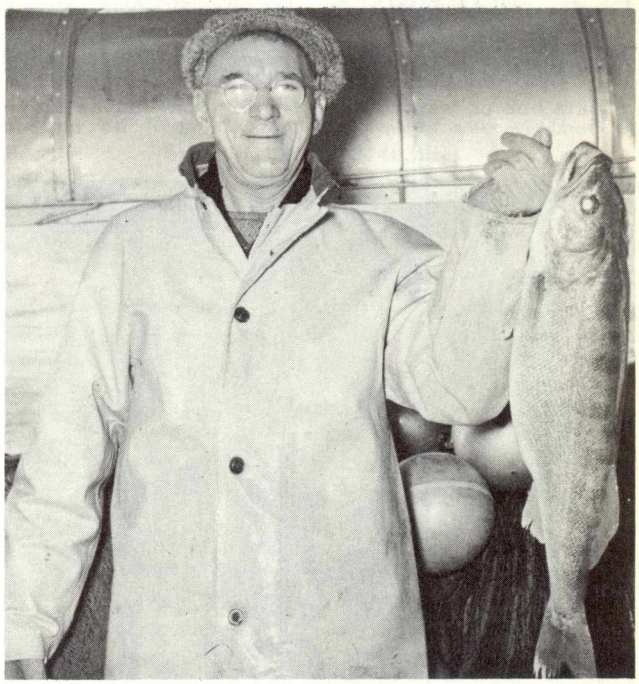
OVER mile after mile of choppy, chill Lake Erie water the flashing arm on the "Erie I's" fish recorder told the same story. It was spelt out by little brown blobs on the machine's sensitized paper, like raindrops on a window pane. As each sweep of the recorder traced the familiar pattern of freckle-like spots above a dense bottom line, federal fisheries gear specialist W.W. "Wes" Johnson explained: "It's like this in many places from one end of the lake to the other."

The "Erie I", under charter to the federal Department of Fisheries, was enroute to her berth at Port Dover after a late fall day of experimental fishing 12 miles out on the lake off Long Point.

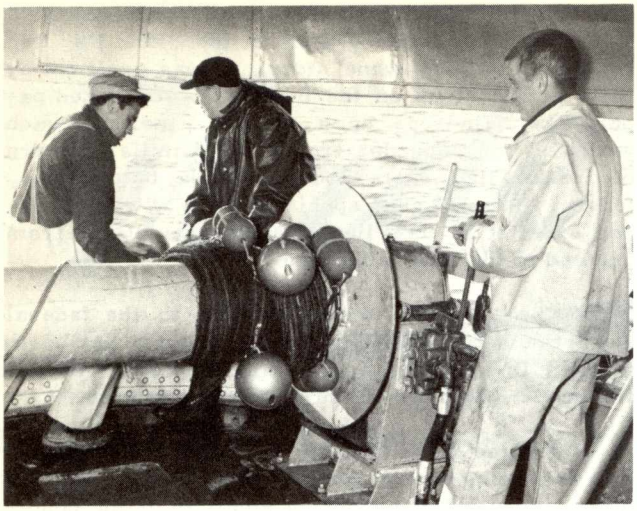
In three drags that day with a mid-water trawl -- a sea-going type of fishing gear -- the vessel had taken some 2,500 pounds of smelt in prime condition, not large, not small.

"We could double that production easily with more sets", said Captain Norm Omstead of Wheatley, Ont., on the western shore of the lake. "Yes, a catch of about 6,000 pounds a day would be a commercially paying proposition for a Lake Erie tug".

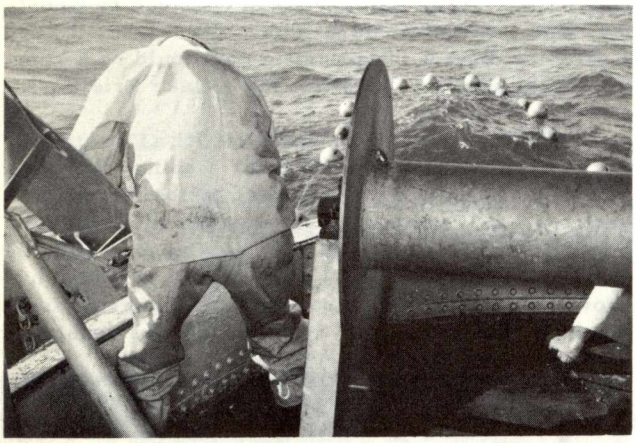
Whatever the economics of that particular day's results, the experimental fishing operation launched on Lake Erie this year by the federal Department of Fisheries in co-operation with the Fisheries Research Board of Canada and the Ontario Department of Lands and Forests had proved one thing. At least one form of marine fishing gear, the mid-water trawl which was developed



Fisherman Bill Dunn of Port Dover and prized pickerel taken in smelt catch.



Shooting away the trawl from the stern of the fishing boat "Erie I"



Floats bob on water as the fishing boat moves slowly ahead.

Preparing to let the hydroplane float go on the port side.

by fisheries gear specialists on Canada's west coast, can catch smelt in inland waters.

Cautiously assessing the results, the fisheries authorities overseeing the operation pointed out that it was still too early to predict the degree of success that might be obtained.

"We must remember", said the federal Department's Industrial Development Director L.S. Bradbury, "that the experiment is still in its infancy. Perhaps as the result of further experimental fishing and modification of the gear, as well as studies of the fish movements and concentration, we may be able to come up with much more effective equipment".

NEW TO LAKE ERIE

Background for the mid-water trawl experiments on Lake Erie has been a population explosion of an erstwhile marine species, the smelt.

"Smelt were unknown in Lake Erie just over a decade ago", says Dr. A.L. Pritchard, Director of the Conservation and Development Service of the federal Department of Fisheries. "Back in the 20's and early 30's the most desirable species, from a fisherman's point of view, were a group of salmonoid fishes, primarily the whitefish, ciscoes (lake herring) and lake trout. Then there was a period in the late 30's and 40's when there were large catches of the 'spiny rays'... such as yellow and blue pickerel, or pike-perch as they are called in the U.S."

Meanwhile, while the so-called "good" fish were being kept, other coarse creatures, such as the sheepshead, were being tossed back in the lake, and it is now obvious that the coarse fish population was building up in relation to that of the more desirable species.

Subsequently, with the pickerel stocks declining the smaller yellow perch became one of the fishes to assume greater commercial importance and the aptly described "butterfly" fillets from these played an important part in keeping the industry going.

But these changes in the lake's population patterns were only the overture to today's turn of events which had its beginning about fourteen years ago, according to most reports, when a quantity of smelt were transplanted from their native ocean habitat to some lakes adjoining Lake Michigan as forage for the resident fish. In some way -- whether through a broken dam or overflow -- the smelt found their way into Lake Michigan, pressed on through Lake Huron and eventually came to Lake Erie.

There, apparently, they found a promised land, an environment, it would seem, to their extreme liking.

"About ten years ago, when we caught the first smelt in Lake Erie, we didn't know what it was", says fisherman Milo Reid. "Then we started getting more smelt each year and now ....."

Today the picture as shown in the swarms of smelt that throng in the shallow waters during the spring spawning run, as reflected on a fish recorder, and as turned up in nets, points to one unmistakable conclusion. Smelt and Lake Erie go together like pork and beans.

Taking advantage of the blooming smelt stocks, the fishing industry on Lake Erie's shores has been marketing smelt for several years and consumers in many parts of Canada and the United States have discovered that they have an equivalent to a sweet tooth for the little fish. However, smelt production is a case of either a feast or a famine. Normally the smelt are harvested in the springtime, or after the ice goes out, when they concentrate to spawn. Catching them at that time is a simple and highly productive process and, in fact, much more fish can be harvested than the plants can possibly handle. However, this period is short-lived at best and the source dries up when the fish again disperse throughout the lake.

Hence the mid-water trawl experiment ... to find a method of catching them in the open lake, over the entire year so that production can be spread out, with a continuing flow of raw material to the plants and of products to the growing markets.

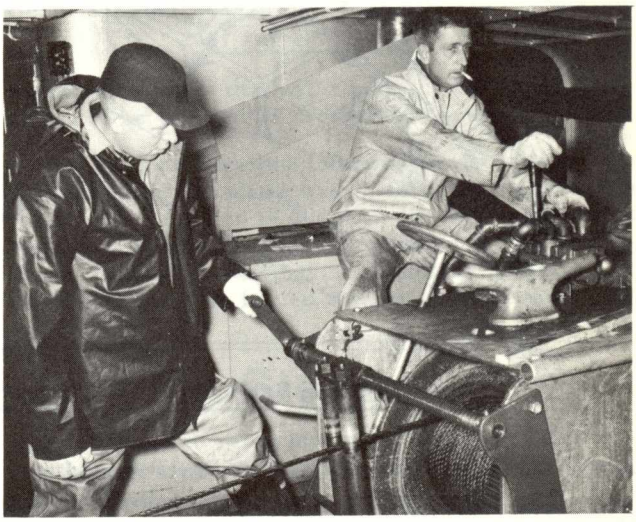
DEVELOPMENT OF TRAWL

Like the erstwhile marine fish it pursues, the mid-water trawl has an ocean history. Known as the Danish floating trawl or "Atom" trawl, it was invented by Robert Larsen of Skagen, Denmark, in 1948, and was designed to be operated by two boats. Subsequently, "Wes" Johnson and the gear experts of the Fisheries Research Board of Canada developed a combination midwater-bottom trawl on Canada's west coast. Considerably modified for single-boat operation, and suitable for use either on the bottom or in upper water layers, the trawl proved to be successful in catching herring in the Pacific, and its use is gradually spreading among fishermen in that area.

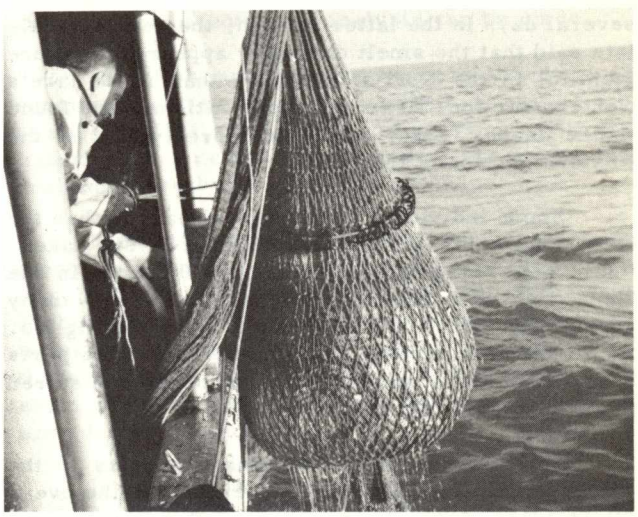
The experiments on Lake Erie were conducted with a trawl of the type developed as the result of the west coast work. Its construction combined: wings and front body section, 6" mesh spaced $1\frac{1}{2}$" apart; main body section $4\frac{1}{2}$" mesh joined mesh to mesh to the 6" mesh; rear body section, 3" mesh joined mesh to mesh to the $4\frac{1}{2}$" mesh; cod end, 1" mesh joined 2-1 to the 3" mesh. In subsequent operations some modifications will be made to find the most effective combinations.

Experimental fishing was begun during the latter part of last year out of Erieau at the western

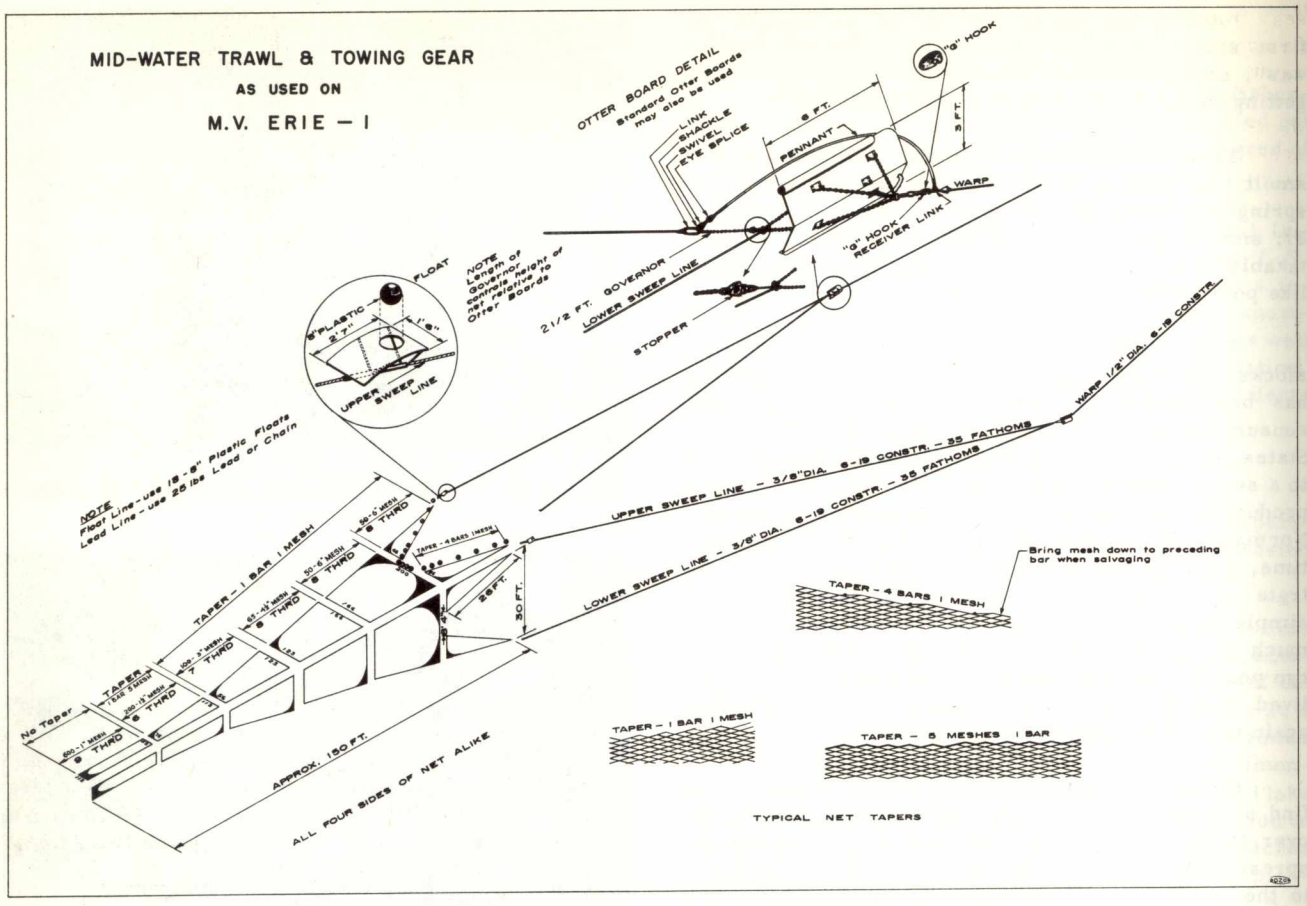
A view of the starboard side gear with otterboard slung overside.



After an hour's drag the warps are winched in bringing net back to boat.



The catch ... a bulging bag (about 800 pounds) ... mostly smelt.



Drawing of the fishing gear used in the experimental fishing project on Lake Erie.

end of Lake Erie aboard the Lake Erie fishing tug, "Erie I". Three weeks were spent in this area and the experiment moved to Port Dover on the lake's eastern shores.

Reviewing the overall fishing results after several days in the latter section, the gear specialists said that the smelt definitely appear to be more plentiful in the Port Dover area than in the lake's western section. Heavier concentrations were found in the deeper water which is more typical of the western section of the lake.

Some individual catches much larger than the 800-pound hauls previously mentioned were taken, the largest being approximately 6,000 pounds in one shot. However, this record haul contained many coarse fish which resulted in a tedious sorting job. As is the lake fishing custom, the desirable parts of the catch were carefully iced in boxes and stored in the insulated forward locker.

Smelt were the predominant species in the catch, accounting for about 97 per cent of the overall results. Apart from coarse fish minor quantities of yellow perch, white bass and yellow pickerel have also been taken.

Boxes of well-iced smelt are stored in forward refrigerated locker.

A side effect of the midwater trawl experiments has been the interest generated among Lake Erie fishermen in new (to that area) methods of fishing. In addition to midwater trawling, the high-

seas method of otter trawling has also taken the fancy of several fishermen and has promoted a rather notable "first" in Canadian fishing annals: the development of the first stern-chute trawler in the entire Canadian fishing fleet. This vessel is actually a conventional boat being converted for stern chute operations similar, but, of course, on a much smaller scale, to the huge factory ships that ply their trade on the Grand Banks.

Fishermen adopting new types of gear have availed themselves of the presence in their area of the federal fisheries specialists whom they have frequently consulted for advice on equipment and fishing practices.

WILL TRY OTHER METHODS

With the midwater trawl experiments now well advanced, other fishing methods are to be tried on Lake Erie to trap the silvery smelt hordes. These include Danish Seining, a grey-bearded European fishing method but a comparatively new child of the Atlantic fishing industry, and purse seining, which is a long proven method for taking salmon and herring on Canada's west coast.

Given suitable weather and ice (or lack of it) conditions, these new experiments may get under way during the current winter months. It is hoped that one or more of the methods applied to Lake Erie will prove successful in exploiting the smelt stocks on a basis that will enable commercial operations to be carried on throughout the entire year.

Gear is taken aboard and boat secured for end-of-day run back to port.

(Further detailed information on the development of the mid-water trawl in British Columbia waters is contained in Bulletin 104 of the Fisheries Research Board of Canada, entitled "A New Mid-water Trawl for Herring", and another Bulletin, No. 123, which will be issued shortly by the Board.) ✔

Information on Arctic Fish Stocks

With the development of fishery projects in the Arctic becoming more concentrated in recent years, fishery biologists are increasing their efforts to discover basic yet vital information on fish stocks of the many water systems throughout this vast area. For countless generations, Eskimos have fished these lakes on a subsistence basis, supplementing their hunting excursions in search of food. In recent years both commercial and sports fishing enterprises have been established in the Canadian north. Science has benefited fishing operations in other parts of Canada, and a project conducted in 1959 by the Arctic Unit of the Fisheries Research Board of Canada will undoubtedly be of great value to federal fishery officials, the Department of Northern Affairs and National Resources, and those concerned with fishing operations in the Arctic.

The Research Board's Arctic Unit, which is based on Montreal, has made a survey of fish stocks of the Mackenzie and Keewatin Districts. This survey covered some 21 lakes extending east from Great Bear Lake to the north-west coast of Hudson Bay. The unit's base of operations was located at Yellowknife, N.W.T. From this base four field parties were transported by air to spend nearly two weeks on each lake. The lakes were carefully selected to represent many watersheds including those drained by the Coppermine, Back, Thelon and Dubawnt Rivers.

The biologists amassed a prodigious amount of data during their investigations in the "land of the midnight sun", and considerable time will be required before a complete analysis can be made.

Whitefish and lake trout were the dominant species in all water areas studied, followed by round whitefish, pike, cisco and grayling. The distribution of arctic char was limited to waters draining directly into the Arctic Ocean.

The Research Board made special arrangements with the Institute of Fisheries of the University of British Columbia, and with the Division of Fishes of the Royal Ontario Museum, for the participation in the survey of senior biologists from those institutions. Both the university and the museum are now identifying the fish taken from the area during the survey.

In addition to information gathered on the fish of the area, the biologists collected a variety of associated material for other organizations and specialists in the many different fields of biology.

Progress in Sea Lamprey Control

By NORMAN S. BALDWIN

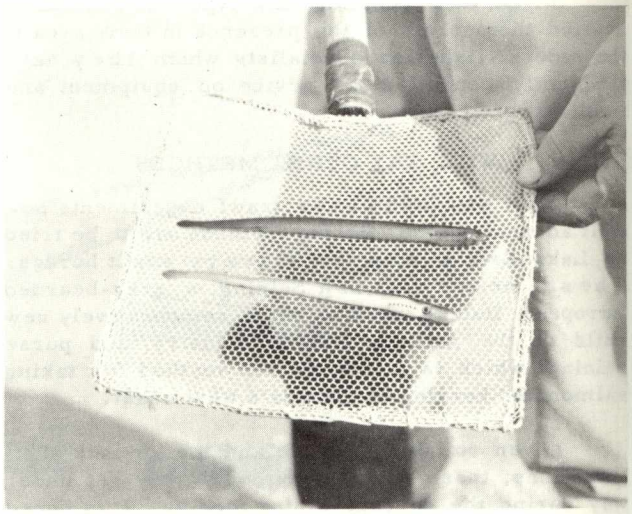
THE GREAT Lakes Fishery Commission held its fourth annual meeting in Niagara Falls, Ont., early in December, 1959. The meeting was attended by the three Commissioners representing Canada and the three Commissioners from the United States, as well as advisors from government agencies, the fishing industry, the angling fraternity and other interested parties.

Dr. A.L. Pritchard of the Department of Fisheries of Canada, Chairman of the Commission, opened the meeting with a review of the Commission's duties and its progress during the past year. Other Canadian Commissioners are Dr. W.J.K. Harkness and Dr. A.O. Blackhurst. Commissioners representing the United States are Lester P. Voigt, Claude Ver Duin and Donald L. McKernan.

The chairman pointed out that the Commission's major responsibility was to formulate and recommend, to the governments of Canada and the United States, measures which would permit a higher sustained production of fish from the Great Lakes. As sea lamprey predation was generally believed to be the most significant factor limiting production at the present time, the Commission had been directed to eradicate or minimize sea lamprey populations.

Lake Superior was the last of the Great Lakes to be invaded by the sea lamprey and the last lake with a trout fishery, said Dr. Pritchard. The decline of the trout catch in Lake Superior, which began in 1953, had continued through 1958, and there were indications that the poundage landed in 1959 would be even lower. It has therefore been necessary to apply the most effective method available in order to reduce sea lamprey predation quickly. The Commission's programme has moved rapidly from experimental to operational chemical treatment of streams in Lake Superior in order to destroy young lamprey before they began to attack the greatly reduced trout population in the lake. At the last annual meeting encouraging reports were heard on the chemical treatment of nine Lake Superior streams in the fall of 1958 and although difficulties were encountered in the expanded programme during 1959, the progress had nevertheless been remarkable.

Mr. Baldwin is executive secretary of The Great Lakes Fishery Commission, which has its headquarters at the University of Michigan, Ann Arbor, Mich.



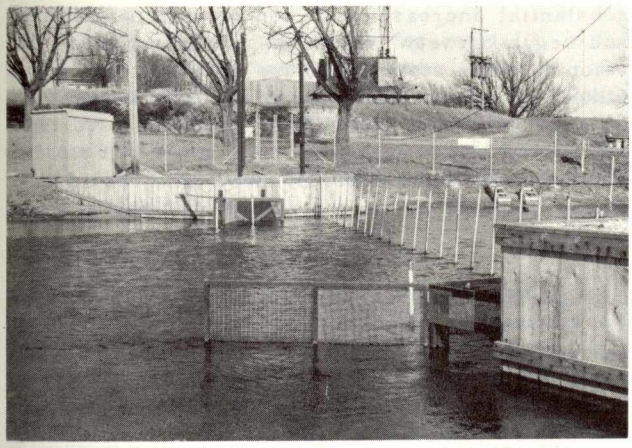
Sea lamprey larva and a transformed sea lamprey

In 1959 chemical treatment crews in Canada and the United States worked both independently and together in close co-operation. Treatments proceeded on schedule during the spring and early summer. The chemical, or lampricide, became less effective in July and the range in concentrations between the levels lethal to young lamprey and harmful to fish narrowed. Treatments had to be postponed on all but the smallest streams to avoid damage to fish populations and excessive use of the supply of lampricide on hand. This lessening of the effectiveness of the chemical in July and August was expected. It continued to be a serious obstacle to stream treatments in September, however, and when an improvement finally occurred in October, record rainfall in the Lake Superior area and resulting high stream flows made the treatment of the remaining large lamprey streams inadvisable. In spite of these difficulties, 38 streams were treated in 1959 with only one failure, and the 14 remaining streams should be dealt with by mid-summer of 1960, if weather conditions permit a reasonably early start in the coming spring.

Electrical barriers, operated on Superior streams to prevent re-infestation and to follow changes in the abundance of adults, took 20 per cent fewer sea lamprey in 1959 than in 1958, marking the

first decrease in the spawning runs in this lake. A decrease in the lamprey catch also occurred on Lake Michigan where barriers were operated on approximately one-third of the spawning streams.

Encouraging indications of a decrease in sea lamprey in Lake Superior were countered by indications that the commercial catch of lake trout this year would be less than the 1958 catch and might not reach 1,100,000 pounds, about one-quarter of the annual catch before the invasion of the sea lamprey.



Electrical barrier on stream flowing into Lake Michigan

The Commission heard detailed reports from its two agencies on sea lamprey control operations, the Fisheries Research Board of Canada and the U.S. Bureau of Commercial Fisheries, and took special note of difficulties encountered during the year. Reports were also presented on sea lamprey projects carried out by the states of Michigan and Wisconsin Conservation Departments in support of the Commission's programme.

The Commission agreed that it was desirable to have information on seasonal changes in lampricide effectiveness well in advance of chemical treatments in order that the latter could be timed to take advantage of favourable periods. It was decided in this same connection to postpone treatment of the Nottawasaga River in Georgian Bay from the fall of 1960 to the spring of 1961. The Commission endorsed a proposal to place two mobile bio-assay laboratories in the field to study seasonal changes in lampricide activity in Lake Michigan and Lake Huron streams. Information on stream conditions associated with this change would be collected to learn the causes of lampricide deactivation.

The Commission gave special consideration to a report on the progress of the trout restoration programme planned by its Committee on Lake Trout Rehabilitation, and implemented to a large degree by the agencies concerned with the fisheries of the Upper Great Lakes.

The Committee reported that studies were being carried on in Lake Superior by the Fisheries Research Board of Canada, the U.S. Bureau of Commercial Fisheries, and the Wisconsin Conservation Department, to learn the present status of the lake trout stocks in various areas of the lake. Commercial catches were being sampled at the major ports of landings in both countries. Data on age and size distribution of the fish caught were being taken to provide indices of year-class strength. This information would be helpful in determining which areas needed hatchery trout. Scarring rates were being followed in order to assess reduction in sea lamprey predation as a result of control measures. The ratio of hatchery fish to native fish in the catches was being recorded to determine the relative contribution of planted trout.

In Wisconsin the catches (net-run) of 10 to 12 fishermen were sampled periodically and information obtained on 5,000 legal and 900 undersize trout. The Bureau of Commercial Fisheries examined 60,000 trout, estimated to be 15 per cent of the catch in United States waters of Lake Superior, for fin clips and lamprey scars, and recorded lengths for slightly more than 19,000 fish. The net-run catches of 10 commercial fishermen were examined once a week. During the season, the Bureau collected a total of 2,500 scale samples and tagged over 500 undersized trout.

SAMPLING LOCATIONS

The Fisheries Research Board of Canada examined the catches at the three major Canadian fishing ports of Port Arthur, Rossport and Mamainse Harbour. Net-run sampling of the commercial catches was carried out at Mamainse Harbour, where approximately 400 (12 per cent undersized) lake trout were sampled each month. At Rossport, where sampling was not continuous, a total of 800 fish were examined. In the Port Arthur area about 1,000 fish were sampled from commercial landings in the Thunder Bay area.

The Committee explained that there had not been sufficient time for the agencies to analyze the data collected in 1959. However, the recoveries of fin-clipped trout showed that hatchery fish had contributed significantly to the commercial catch near the planting areas. The percentage of hatchery trout in the catches varied from area to area and from month to month. It was consistently higher in the area extending from the Apostle Islands to the tip of the Keweenaw Peninsula, where the percentage of hatchery trout ranged from 4.5 to 46.0. It was pointed out, however, that the production of lake trout in this area had dropped by about 50 per cent since 1955 and was, presently, at a very low level. In the Michigan waters east of the Keweenaw Peninsula, the percentage of hatchery fish in the catches was low and very few fin-clipped trout were recovered in the Isle Royale fishery. No fin-clipped trout were taken in the Canadian waters at the east-

ern end of the lake, but trout planted by the Ontario Department of Lands and Forests in 1958 and 1959 in the Rossport area were recovered this year in the planting area and to the west in the vicinity of Port Arthur.

During the 1959 season, the U. S. Bureau of Commercial Fisheries research vessels, the "Cisco" and "Siscowet", operated in Lake Superior. The "Cisco" limited her operations to the south side of Lake Superior, east of the Keweenaw Peninsula. The primary objectives were to determine the abundance, composition, and distribution of the fish stocks, particularly lake trout and chubs. The "Cisco" repeated the population studies of lake trout conducted in 1953 in order to determine what changes had taken place during the past six years. In addition, she fished on known spawning reefs in the Marquette area during her last cruise to obtain information on the abundance of mature trout.

YOUNG TROUT SCARCE

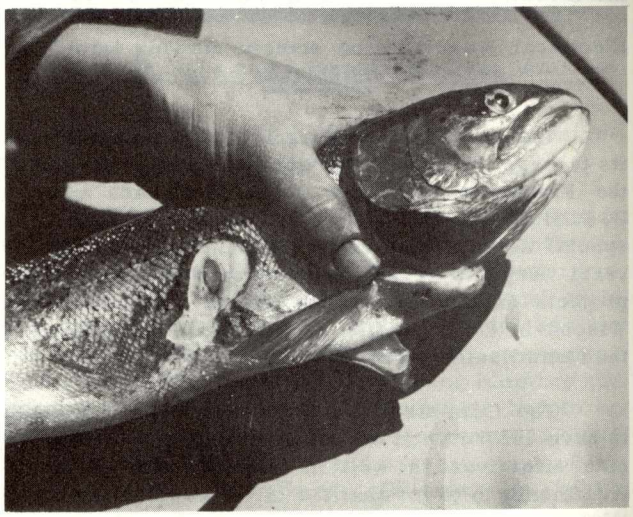
Although the 1959 data had not been analyzed, the Committee believed that there was already evidence of a scarcity of young trout along the south shore. During the entire season only six young-of-the-year trout were captured as compared to 318 in 1953 during similar operations. In addition, a total of only six one-year-old lake trout were taken as compared to 162 in 1953. Extremely bad weather restricted the "Cisco's" study on the spawning trout and only four lifts of gill net, each of about 4,500 feet, were made. Only two lake trout, both ripe males, representing 0.5 pounds of spawning lake trout per 1,000 feet, were caught. Nets set in this area in 1952 and 1953 took 157 and 65 pounds of spawning lake trout per 1,000 feet of gill net, respectively.

The "Siscowet", operating in the western end of the lake, took 165 lake trout in her sampling nets and trawls, of which four were young-of-the-year. Forty per cent of all trout taken, and 68 per cent of those between five to eight inches in length, were marked hatchery fish. The "Siscowet" also lifted about 45,000 feet of gill net on nine different spawning reefs known to be productive in earlier years, and took only 20 spawning lake trout, all males, ranging from 22.6 to 33.5 inches in total length.

The Committee stressed the need to complete aging of the lake trout sampled to determine which year-classes were weak or missing. It reported that, as present, hatchery facilities in the Upper Great Lakes area could produce approximately $3\frac{1}{2}$ million one-year-old lake trout annually. Actually this total was difficult to attain because production was currently limited by the number of lake trout eggs available. In past years eggs had been obtained from Lake Superior, but mature fish were now so scarce that other sources must be found. In order to assure a future supply of eggs, brood stocks were being developed in hatcheries and collections from various inland lake sources had been started by federal, state and provincial agencies.

There were approximately 56,000 lake trout brood fish presently retained in hatcheries by different agencies. Eight different year-classes from ages two to 11 years were represented, although only a small percentage was now sexually mature. Their egg production represented 40 per cent of the total collected by all agencies this year. By 1962 this percentage would increase to possibly 75 per cent. Although present hatchery space limited any substantial increase in brood stocks, negotiations had begun between Wisconsin and Michigan to develop a brood stock from the lake trout in Green Lake, Wisconsin, which were the only known trout of Lake Michigan origin available. These trout were deep-water spawners and matured at smaller sizes than the Lake Superior fish. They could be of prime importance in the future stocking of Lake Michigan.

Egg collections by the Michigan Conservation Department in 1959, from brood fish in hatcheries and wild fish in a number of inland lakes, totalled 1,383,000. The Wisconsin Conservation Department obtained 55,000 eggs from native fish in the



Rainbow trout with lamprey wound penetrating to body cavity

(Milwaukee Journal Photo)

Apostle Islands area. This number represented a substantial reduction from collections of approximately 300,000 eggs in previous years. The U.S. Bureau of Sport Fisheries and Wildlife obtained a total of 552,000 eggs from brood fish retained at its hatchery in Manchester, Iowa, composed of Lake Superior Isle Royale stock, now eight years old, and Great Slave Lake stock, now seven years old. The Minnesota Conservation Department conducted spawn-taking operations in four inland lakes, but took only 8,000 eggs. A total of 460 lake trout were caught, but most were green or spent. The total

lake trout egg collection by the Ontario Department of Lands and Forests was 1,929,800. The collection included 1,899,600 from seven inland lakes and 30,200 from hatchery brood fish. The Illinois Conservation Department does not engage in spawn-taking operations, but it again purchased 200,000 lake trout eggs from a Spokane, Washington, trout farm for the rehabilitation programme. The eggs were transferred to the U.S. Bureau of Sport Fisheries and Wildlife hatchery at Charlevoix and would be used to continue a series of test plantings in Lake Michigan.

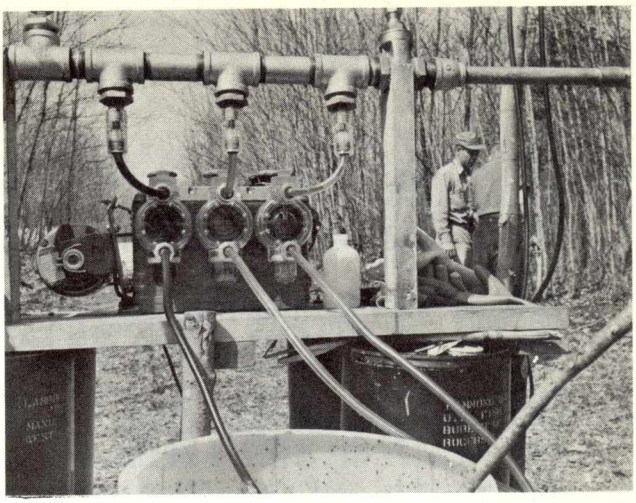
After allowance is made for mortality in the hatchery and the retention, by some agencies, of a small percentage of the stock for inland lake plantings, the Committee estimated that about $1\frac{1}{2}$ million one-year-old trout would be produced from this year's egg collections for stocking the Great Lakes in the spring of 1961.

NEW VENTURE

It was pointed out that artificial propagation of lake trout on a large scale represented a new venture in fish culture and posed many problems. The maximum survival of lake trout at all stages of hatchery development was essential to fully utilize the limited number of eggs available and minimize programme costs. At present there was definite need for a better understanding of the general physiology of lake trout and conditions affecting its survival. As a result of the development of substantial numbers of lake trout brood fish of various sizes and ages in the Upper Great Lakes hatcheries, an unusual opportunity existed for educational institutions in the Great Lakes region to utilize the lake trout as subjects for experimentation and for governmental research agencies to conduct more applied research on specific problems associated with hatchery survival.

The Commission was advised that the first of a series of test plantings had been made in Lake Michigan in 1959, when 35,600 yearling trout were released on Sheboygan reef. Voluntary reports on recoveries of these fish by selected commercial fishermen were expected to provide information needed on the movements and early survival of the hatchery fish under lamprey predation. It was expected that this information would indicate when, in advance of lamprey control, lake trout could be safely planted in the lake.

Trout plantings in the Great Lakes have generally been made in the open lake in water 15-25 fathoms deep. The provision of fishing vessels from co-operating commercial fishermen, the availability of patrol vessels in Michigan and Wisconsin, and the use of the Ontario Department of Lands and Forests boats and aircraft had made this procedure possible. As the stocking programme developed in Lake Superior and extended into Lakes Michigan and Huron, the numbers of fish and the



Pump used to maintain desired concentration of chemical in stream

areas to be planted would be greatly increased and the distribution procedures now used could no longer be followed without greatly expanding present distribution facilities. The Committee recommended that changes in present methods of planting be explored to see if the high distribution costs could be avoided. The procedure of stocking yearling trout in water 15-25 fathoms deep was based on previous research which showed that native trout of this age were found at this depth. There was no direct evidence to suggest that this procedure was preferable to shore plantings. The Committee therefore proposed that regular releases of distinctly marked trout planted by as many different methods as possible be made in 1960. Some groups would continue to be planted by boat in the open lake, others from docks, bridges and possibly tributary streams. Careful selection of the shore plant locations would be necessary to avoid predation by warm-water species, assure favourable temperature conditions and easy access to deep water.

Experiments to date had shown that lake trout reared in the hatchery to yearling stage and planted in the spring survived better than trout planted at earlier ages. The present stocking programme was confined to the spring planting of yearlings. However, due to the present scarcity of native trout in the lakes, it was suspected that the survival of hatchery trout planted at earlier ages might be quite good. The Committee proposed that groups of marked fingerlings be planted in both Lake Superior and Lake Michigan during the fall of 1960 and their survival followed. The Committee believed, however, that planting of fingerlings in the fall was feasible only as long as the lake trout population remained low and that the practice, if adopted, would require re-assessment as the populations built up. Trout breeding experiments by the Ontario Department of Lands and Forests, using hybrids between speckled trout and lake trout as a basis for

(Continued on page 14)

Canadian Fisheries in November

ROUGH weather in November limited the operations of Canadian sea fishermen but when fishing was possible it was also profitable for fish were generally plentiful, markets were strong and prices were good.

Landings in the Maritime Provinces were the most adversely affected by the weather. Not only was the month's catch, and consequently the level of fishermen's income, considerably reduced but two storms which lashed the Bay of Fundy in quick succession caused severe losses of lobster gear.

Although Newfoundland got its share of the bad weather, the fisheries there continued to consolidate their recovery from a very poor year in 1958; while on the Pacific Coast there was a welcome upturn from the scarcities, disappointments and strikes which disrupted operations earlier in the 1959 season. Excellent winter herring catches taken by a new method in November were a doubtful boon to the fishermen, as reduction plants were heavily supplied and, when markets failed to strengthen in December, terminated their buying, announcedly for the winter.

Meanwhile winter fishing was getting under way on the freshwater lakes with prospects of a continuation of last summer's good results.

ATLANTIC

Late autumn gales so hampered fishermen of the Maritime Provinces that their November catch was the smallest in three years. Its landed value dropped below $1.5 million in spite of generally good price levels.

Groundfish seemed to be reasonably plentiful on the offshore banks but the weather was usually too rough for longliners and small draggers, while even the larger vessels were often obliged to postpone their trips or, when they could get to sea, interrupt their fishing and batten hatches to ride out one more storm.

A Department of Fisheries vessel having located a good concentration of redfish off Cape Sable, one of the Halifax skippers tried the area. The fish were too deep for his gear so he went on to the Labrador grounds, where he took the biggest redfish catch landed in southern Nova Scotia this year. Redfish had been scarce all summer and fall so were in demand at the plants.

In the Gulf of St. Lawrence vessels of the Caraquet, Shippegan and Souris fleets were being beached one after another for the winter. A few of them, still making occasional trips, secured fairly good catches of cod and plaice.

Inshore groundfishing was almost at a standstill. A gillnet cod and pollock fishery in Halifax county was the main effort but produced only meagre results.

Gear losses were severe in the lobster fishery. In southern New Brunswick the season opened November 15. A week later up to one-third of the gear which had just been set was lost in a storm that battered all the Fundy area. Lobstermen were still searching for lost traps when a second storm increased the total loss to between 50 and 70 per cent in exposed districts.

As demand was heavy in advance of the holiday season and landed prices ranged up to 60 cents per pound, preparations were intensified in southern Nova Scotia for the opening there on December 1. Tens of thousands of traps were set November 30 by about 5,000 lobstermen in nearly 3,000 boats. Seas were still so heavy after the two recent storms that the smaller boats could not venture beyond sheltered waters and some traps had to be sunk within harbour limits.

Anticipating the full report on December, which is not yet available, it may be said here that weather was fair for the opening days and catches were excellent. Heavy shipments of live lobsters went forward by air to hotels and restaurants in Canada and the United States and even in Belgium and Holland. Legally the open season lasts to the end of May in this area but winter weather usually forces the men to beach their gear through most of January and February.

Herring were still fairly plentiful in the Bay of Fundy. Weirs had been badly pounded by the storms but the seines took satisfactory quantities when weather permitted fishing.

Large schools of small mackerel were located at various points but fishermen had little success when trying to catch them. Ice settling in bays and inlets put an end to oystering and net fishing for smelt. Oyster supplies failed to meet holiday market demands, which exceeded expectations. Scallop dragging was profitable as fishing was good and prices remained steady.

Unlike the other Atlantic Provinces, Newfoundland had better fishing than in November of the previous year. The weather was as rough and windy as elsewhere on the east coast. It reduced the inshore effort to a little cod, salmon and herring fishing at scattered points and also cut into offshore operations. But fish were fairly plentiful on the banks and also in the Port aux Basques area. The cod catch was 73 per cent heavier and 80 per cent

(Continued on page 13)

Canadian Fisheries News

Departmental Meeting

Senior officials of the federal Department of Fisheries from all commercial fishing areas of Canada and from Ottawa headquarters were complimented on their work by Fisheries Minister J. Angus MacLean, who welcomed them to the 11th annual meeting of the Department, held in Ottawa this month.

Mr. MacLean paid particular tribute to the long and meritorious service of two Area Directors of the Department who will retire during the current year, A.J. Whitmore of Vancouver and G.S. Reade of Winnipeg. In 43 years with the Department, both in Ottawa and in the Pacific Area, Mr. MacLean said, Mr. Whitmore has accumulated a vast amount of knowledge of the fisheries and his services will be greatly missed, as will those of Mr. Reade. The latter, with 32 years' service, has represented the Department in several regions of British Columbia, and for the past two years has been Director of the Central Area, dealing with those inland fisheries which the Department administers.

The meeting was under the chairmanship of Deputy Minister of Fisheries G.R. Clark. For purposes of fisheries administration, Canada is divided into five main areas, Pacific, Central, Quebec, the Maritimes and Newfoundland, and the theme of this year's meeting, discussed by senior personnel from the field and from headquarters, was "The Role of the Area Director in Fisheries".

Senior Officials Promoted

Two senior federal fisheries officers have been promoted as the result of Civil Service Commission competitions. They are R.E.S. Homans of Halifax, appointed Assistant Area Director for the Maritimes Area, and J.G. Hutchison of Ottawa, appointed Chief of the Protection Branch of the Department's Ottawa headquarters staff.

Mr. Homans

Mr. Hutchison

Mr. Homans, a native of Port Mouton, N.S., graduated from Dalhousie University in 1937 with a Master of Science degree, majoring in biology and chemistry. After graduation he worked with the Fisheries Research Board of Canada until he joined the staff of the Department's Fish Inspection Laboratory at Halifax in 1940. He was appointed Chief of the Department's Fish Inspection Branch for the Maritimes Area in 1950.

Mr. Hutchison joined the Department of Fisheries in 1946 as master of a patrol vessel in the Department's Pacific Area. He was appointed Fishery Officer in 1947 and a year later became Marine Officer at the Area Headquarters in Vancouver, B.C. In 1955 he was appointed Chief Protection Officer for the Pacific Area, and was transferred to Ottawa in 1957 as Chief Purchasing Agent for the Department.

CANADIAN FISHERIES . . .

(Continued from page 12)

more valuable than in the previous November; the combined haddock, plaice and greysole catch was a million pounds heavier; the herring catch increased by 1.5 million pounds. Only redfish was scarce, as it had been all summer.

Output of both freezing and salting industries continued ahead of the previous year's levels. The 1959 production to November 30 amounted to 57.4 million pounds of frozen groundfish, 204,000 quintals of light-salted cod and 687,000 hundred-weights of heavy-salted cod. After the previous year's scarcities, stocks at November 30 were at levels believed to be adequate for the winter's market demands.

Preparations were under way for the winter herring fishery on Newfoundland's west coast but to the end of the month no heavy run of fish had appeared. Local plants were planning to vinegar-cure the bulk of the catch and use most of the surplus for meal, as the demand for pickled herring seemed less assured.

PACIFIC

The poor results which dogged British Columbia fishermen through the summer and early fall changed so much for the better that their November catch and income exceeded the same month's results in the banner year 1958.

Their salmon catch exceeded 1½ million pounds in volume and a quarter of a million dollars in value. When the month began, troll boats from all the surrounding area were fishing a fair-sized body of winter spring salmon off Victoria, averag-

ing about 50 pounds per boat per day and selling large red springs at up to 60 cents per pound in Vancouver, or 56 cents in Victoria. Vancouver was also getting heavy receipts of coho salmon by truck and packer from troll fleets scattered over the straits between Vancouver Island and the mainland and from the west coast of Vancouver Island, where offshore trolling had just closed and the last of the catch was being assembled. Light trolling continued throughout the month inside Barkley Sound.

Gillnetting for chums reopened in some of the inner waters on November 9 and in the Fraser River on November 18. Also the Nimpkish area on Vancouver Island reopened to salmon purse seining for a limited period. Troll catches dropped steeply as the men changed gear to take advantage of the net fisheries and buying camps which had been handling the troll catch prepared to close at the end of the month. The Nimpkish fleet included 35 seiners and 85 gillnetters at the peak of its operations and took 27,000 chum salmon, as compared with 2,300 fish in the corresponding cycle year 1955. The Fraser fishery also was highly successful. After a poor opening in fog and wind, a catch of 40,000 chums was landed with boats earning up to $1,300 in 44 hours of fishing.

Herring fishermen also fared well in November, landing 125 million pounds, which they sold, nearly all of it to meal and oil plants, for $2 million.

Herring were so plentiful that catch quotas were extended in some districts. Most of the seiners were newly equipped with blue mercury lights of high wattage which, hung high on either side of the pilot house, proved extremely effective for night fishing. The most intensive effort was off the east coast of Vancouver Island but smaller fisheries in Barkley Sound and even in the Prince Rupert area also prospered. The herring were of good size for commercial purposes and in excellent condition. The four reduction plants at Steveston were in full operation and Port Alberni was reducing 300 tons per day, getting 23.5 gallons of oil and four sacks of meal per ton.

Storage problems soon developed at the plants as the oil market was depressed and meal stocks also threatened to outrun available space.

Soles and other flatfish remained rather scarce but the trawlers landed good catches in lingcod and greycod for the time of year, especially from grounds off Victoria where vessels from both Victoria and Vancouver fished round the clock through the early part of the month with very good results. The lingcod fishery closed November 30 for three months and, as this activity waned, more and more of the men went "liver fishing" under the subsidy programme of the federal government. This programme is designed to reduce the number of dogfish on some Pacific fishing grounds. To the end of November subsidies had been paid on 700,000 pounds of dogfish livers.

FRESHWATER

The month's freshwater catch amounted to between 2.5 and 3.0 million pounds, most of which was exported to fresh fish outlets in the United States. Whitefish and perch each accounted for about one-third of the total. Pickerel commanded the highest landed price, 28 cents per pound. Fishermen sold whitefish and lake trout at 20 cents per pound.

Good catches were taken in Ontario during the first half of the month but cold weather in the second half stopped operations in northwestern Ontario. Winter fishing opened in the Prairie Provinces during the month with good markets and firm prices. Whitefish made up the bulk of this catch.

LAMPREY CONTROL . . .

(Continued from page 11)

selection, were progressing satisfactorily. The objective was to produce a fast growing fish resembling the lake trout in appearance and behaviour in most respects and the speckled trout in respect to age at maturity. The first approach was to select those hybrids having the ability to retain gas in their swim bladders while under pressure and presumably able to live in deep water, and then retaining only the early maturing individuals for breeding stock. Many of the pressure selected fish matured this fall as one-year-olds, nine to 11 inches long. The second approach has been to plant first generation hybrids and the progeny of first generation hybrids backcrossed to lake trout in South Bay, Manitoulin Island, and northern Georgian Bay, where they would be exposed to natural selection. Sea lamprey were expected to eliminate the late maturing individuals, while summer temperature stratification would favour the deep-swimming fish. Some 20,000 hybrids were released in South Bay and 110,000 in Georgian Bay in 1959.

Early information on the growth and survival of 157,000 hybrids planted in Georgian Bay in 1958 has been encouraging. Some recaptures were made through the ice during the past winter. In the spring of 1959 pound-netters at Killarney encountered substantial numbers of the hybrids averaging 14 inches in length, with a few approaching the legal size limit of two pounds. Later recoveries have indicated that the hybrids were becoming widely dispersed in Georgian Bay. An estimated 1,500 have been recovered from the 1958 planting.

The Commission deferred action on the Committee's recommendations and several other matters, including the adoption of a 1961-62 lamprey programme until its next meeting which will be held in Ann Arbor, Michigan, in June, 1960.

Fishery Figures For November

SEAFISH: LANDED WEIGHT AND LANDED VALUE

	May - Nov. 1958		May - Nov. 1959	
	'000 lbs	$'000	'000 lbs	$'000
CANADA - TOTAL	1,474,155	84,127	1,497,564	73,810
ATLANTIC COAST - Total	995,524	38,331	1,123,297	44,863
Cod	461,693	11,111	585,860	15,565
Haddock	42,434	1,751	46,137	1,954
Pollock, Hake & Cusk	68,375	1,228	65,517	1,269
Rosefish	55,273	1,336	36,014	852
Halibut	4,046	1,054	4,067	1,027
Plaice & Other Flatfish	67,146	2,127	74,739	2,367
Herring & Sardines	185,652	2,490	204,960	2,949
Mackerel	15,160	766	8,921	545
Swordfish	5,377	1,439	6,702	1,384
Salmon	3,440	1,207	3,880	1,408
Smelts	1,858	271	1,233	159
Alewives	8,736	122	10,968	167
Other Fish	29,888	485	19,086	348
Lobsters	34,992	11,460	36,569	12,711
Clams & Quahaugs	4,316	205	5,043	220
Scallops	2,516	933	3,927	1,452
Other Shellfish	4,622	346	9,674	486
PACIFIC COAST - Total	478,631	45,796	374,267	28,947
Pacific Cods	6,245	432	7,331	543
Halibut	22,264	4,603	21,999	4,067
Soles & Other Flatfish	5,436	277	3,403	187
Herring	262,175	4,345	229,374	3,806
Salmon	174,697	35,545	102,880	19,671
Other Fish	1,939	60	2,938	134
Shellfish	5,875	534	6,342	539
BY PROVINCES				
British Columbia	478,631	45,796	374,267	28,947
Nova Scotia	341,002	15,544	311,972	16,730
New Brunswick	146,949	6,547	198,421	7,496
Prince Edward Island	36,674	3,488	38,144	3,881
Quebec	98,671	3,395	102,987	3,782
Newfoundland	372,228	9,357	471,773	12,974

MID-MONTH WHOLESALE PRICES, Nov. 1959

		Montreal	Toronto
		$	$
Cod fillets, Atl. fresh, unwrapped	lb	.317	.362
Cod fillets, Atl. frozen, cello 5's	lb	.267	.310
Cod fillets, smoked	lb	.353	.398
Haddock fillets, fresh, unwrapped	lb	.435	.482
Herring kippered, Atl.	lb	.256	.297
Mackerel, frozen, round	lb	.252	.268
Lobsters, canned, Fancy	case 48-½s	42.18	43.88
Sardines, canned	case 100-¼s	9.04	8.95
Halibut, frozen, dr.	lb	.377	.388
Silverbright, frozen, dr.	lb	.417	.407
Coho, frozen, dressed	lb	.633	.637
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	.371	.350
Lake Trout, frozen	lb	.420	.415

PRICES PER CWT. PAID TO FISHERMEN
(Week ending Nov. 14th)

	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	7.00	7.00
Black's Harbour		
Sardines	2.00	-
St. John's, Nfld.		
Cod	2.00-2.25	2.25
Haddock	-	2.25 rnd
Rosefish	2.00	-
Vancouver		
Ling Cod	10.00	10.00-14.00
Grey Cod	3.50- 6.00	5.00- 6.00
Soles	8.00- 9.00	8.00- 9.00
Salmon(Rdspg.)	**27.00-35.00	*34.00-44.00

** mixed * med. & small

Fishery Figures For November

STOCKS AS AT END OF NOVEMBER

		1958	1959
		'000 lbs	'000 lbs
TOTAL - Frozen Fish, Canada		63,722	73,420
Frozen-Fresh, Sea Fish - Total		44,291	53,371
Cod, Atlantic, fillets & blocks		5,129	16,188
Haddock, fillets & blocks		2,082	6,001
Rosefish, fillets & blocks		2,744	1,425
Flatfish (excl. Halibut), fillets & blocks		3,121	2,888
Halibut, Pacific, dressed & steaks		8,378	9,227
Other Groundfish, dressed & steaks		2,340	3,132
Other Groundfish, fillets & blocks		2,627	2,674
Salmon Pacific, dressed & steaks		10,629	5,963
Herring, Atlantic, and Pacific		1,623	483
All Other Sea Fish, all forms		4,074	3,465
Shellfish		1,544	1,925
Frozen-Fresh, Inland Fish - Total		8,757	7,623
Perch, round or dressed		637	331
Pickerel (Yellow), fillets		386	386
Sauger, round or dressed		223	177
Tullibee, round or dressed		453	278
Whitefish, round or dressed		1,613	1,929
Whitefish, fillets		1,066	704
Other, all forms		4,379	3,818
Frozen-Smoked Fish - Total		1,627	1,658
Cod, Atlantic		536	773
Sea Herring, kippers		791	406
Other, all forms		300	479
Frozen for Bait and Animal Feed		9,047	10,768
Salted and Pickled Fish, Atl. Coast			
Wet-salted - Total		33,370	44,666
Cod		21,657	34,972
Other		11,713	9,694
Dried - Total		20,944	23,594
Cod		19,504	22,139
Other		1,440	1,455
Boneless - Total		661	594
Cod		555	552
Other		106	42
Pickled - Total	(barrels)	25,860	18,561
Herring	"	6,039	5,572
Mackerel	"	8,181	966
Alewives	"	11,540	10,911
Turbot	"	100	1,112
Bloaters	(18 lb. boxes)	206,312	158,650
Boneless Herring	(10 lb. boxes)	5,051	9,418

CANADIAN EXPORT VALUE OF FISHERY PRODUCTS, MAY-OCT.

(Value in Thousands of Dollars)

	1958	1959
Total Exports	85,756	81,286
By Markets:		
United States	62,259	60,381
Caribbean Area	8,172	7,290
Europe	13,819	12,129
Other Countries	1,506	1,486
By Forms:		
Fresh and Frozen	55,115	54,362
Whole or Dressed	22,225	20,314
Salmon, Pacific	7,259	4,884
Halibut, Pacific	2,849	2,814
Cod, Haddock, Pollock, etc.	387	306
Swordfish	1,720	2,053
Other Seafish	2,327	2,612
Whitefish	2,963	3,163
Pickerel	1,635	1,645
Other Freshwater fish, n.o.p.	3,085	2,837
Fillets	21,240	21,105
Cod, Atlantic	8,700	8,783
Haddock	1,677	2,714
Rosefish, Hake, Pollock, etc.	2,427	1,555
Flatfish	3,279	3,385
Pickerel	1,655	1,261
Other	3,502	3,407
Shellfish	11,650	12,943
Lobster (Alive & Meat)	10,631	11,656
Other	1,019	1,287
Cured	10,942	9,093
Smoked	730	667
Herring	523	431
Other	207	236
Salted, Wet & Dried	8,803	7,255
Cod	7,607	5,707
Other	1,196	1,548
Pickled	1,409	1,171
Herring	834	721
Mackerel	255	124
Other	320	326
Canned	15,856	12,571
Salmon, Pacific	12,861	9,236
Sardines	1,314	1,503
Lobster	1,472	1,557
Other	209	275
Miscellaneous	3,843	5,260
Meal	1,450	2,894
Oil	277	473
Other	2,116	1,893

Fisheries News From Abroad

German Fisheries Research Centralized

German Fisheries Research has established its headquarters in the Hanseactic City of Hamburg. All important institutes of the "Bundesanstalt fur Fischerei" (Federal Institute of Fisheries), which until now have been scattered and housed only provisionally, are to be assembled under one roof. The Institute of Fishery Biology of the University of Hamburg will be housed in special quarters in the immediate vicinity of the projected new building. Moreover, a research laboratory for radioactivity has already been set up in the suburb of Alsterdorf which investigates the effect of radioactive isotopes on the fish.

This concentration of German fisheries research will undoubtedly also facilitate the international exchange of experiences. Many German scientists have already gained a good reputation for themselves in the Food and Agriculture Organization.

The success of the German catches, which now average 700,000 tons of fish per annum -- around the turn of the century the figure was only 35,000 tons -- is in essential due to science. Deep sea fishermen have also to thank the men in the institutes and laboratories for the development of technical aids such as the echo-sounder, perlon nets, and the fish spotter.

Today the Hamburg institutes are like a general headquarters where all the questions concerning inland and deep-sea fisheries are examined. Precise knowledge of the habits of the denizens of the sea plays a big part in this. Their study has very often led to the discovery of new fishing-grounds. Thus the German fishery research ship "Anton Dohrn" succeeded in tracking down large masses of Norwegian haddock between Iceland and Greenland, which ensured rich catches. During recent years German trawlers penetrated as far as Spitzbergen and Labrador and even tried their luck off the west coast of Greenland.

The economic security of coastal fishermen is one of the tasks with which the Institute of Coastal and Inland Fisheries has to deal. Apart from important investigations on behalf of oil herring and crab fishing this Institute has submitted surprising observations regarding the migrations of eels. A total of 1,717 eels were caught, marked, and then returned to their element in the spring and summer of 1957. A similar experiment was carried out last fall. Catching the marked animals again, an attempt which was 27.1 per cent successful in the second experiment, furnished interesting results.

German herring boat at dockside

As a large number of the eels of the Elbe were discovered in Danish waters, it was concluded that when the eels migrate towards the Atlantic they do not prefer the southern North Sea and the English Channel, but in all probability follow a coastal current in a northerly direction and do not take a western course until they are north of Scotland.

All the knowledge gained in the matter of fishing grounds and the quantities of fish, no matter how important, could hardly be utilized in practice, however, without modern net material and exact position finders. The suggestions for improvements and reports of experiences of the Institute for Net and Material Research are therefore given due regard by all inland and deep-sea fishermen. This assures, above all, that the German fishery does not become out-of-date as regards technical equipment.

Before the fish reaches the consumer, it must still be processed, preserved, and kept fresh by means of special installations. The Institute of Fish Processing has done meritorious work in this respect. The introduction of an efficiency test for obtaining a quality mark for fishery products as well as the carrying out of export inspections are due to this Institute.

Albacore tuna will show up in large numbers late this winter off Japan, according to a forecast by the Fisheries Laboratory of Tokai University, Shimizu. Formerly about 30 albacore boats used to fish from that area beginning late in October, but this winter season got off to a late start. It was expected, however, that the boats would shift from saury fishing to albacore fishing towards the end of 1959 to supply the canners of Shizuoka district.

Norway

EXPORTS OF PRINCIPAL FISHERY PRODUCTS

January - June, 1959

Quantities in Thousands of Pounds — Value in Thousands of Kroners

DESTINATION	TOTAL EXPORTS		MAINLY COD				HERRING HERRING				CANNED FISH	OILS	OTHER PRODS
	Quan.	Value	Fresh	Frozen	Salted & Dried	Stock-fish	Fresh	Frozen	Salted	Meal			
	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.
Canada	1,244	3,258	-	-	-	-	-	-	-	-	1.175	-	69
U.S.A.	31,164	47,471	-	9,564	664	26	-	-	3,990	-	11,204	774	4,942
Other Western Hemisphere													
Brazil	9,639	13,110	-	-	7,815		-	-	-	-	-	824	-
Br. W. Indies,others	260	180	-	-	-	-	-	-	-	-	-	-	260
Chile	4	4	-	-	-	-	-	-	-	-	-	4	-
Cuba	4,451	7,280	-	-	3,785	-	-	-	-	-	-	-	666
Dom. Republic	485	342	-	-	-	-	-	-	-	-	-	-	485
Fr. Dep. N.A.	249	174	-	-	-	-	-	-	-	-	-	-	249
Jamaica	258	176	-	-	-	-	-	-	-	-	-	-	258
Mexico	567	814	-	-	333	-	-	-	-	-	-	234	-
Netherlands W. Indies	212	321	-	-	212	-	-	-	-	-	-	-	-
Peru	53	143	-	-	53	-	-	-	-	-	-	-	-
Trinidad & Tobago	644	726	-	-	441	-	-	-	-	-	-	-	203
Venezuela	948	1,725	-	-	948	-	-	-	-	-	-	-	-
Europe													
Austria	5,108	3,502	-	1,287	-	-	-	419	-	1,854	-	216	1,332
Belgium	12,162	8,677	1,118	-	-	101	-	961	-	9,085	529	269	99
Bulgaria	4,978	1,555	-	-	-	-	-	4,317	-	-	-	-	661
Czechoslovakia	30,581	11,763	-	1,519	-	-	6,932	18,448	-	-	-	3,682	-
Denmark	9,041	5,165	-	-	-	-	-	-	284	-	-	1,120	7,637
Finland	1,362	884	-	-	-	-	-	-	-	-	-	234	1,128
France	35,931	20,665	4,720	370	-	-	1,772	1,625	1,858	22,057	481	145	2,903
Germany East	49,118	13,465	1,056	650	-	-	27,599	18,717	-	1,096	-	-	-
Germany West	69,163	25,910	198	4,824	-	64	37,919	9,414	3,457	7,782	496	898	4,111
Greece	399	307	-	-	-	-	-	-	-	-	-	-	399
Ireland	201	298	-	-	-	-	-	-	-	-	201	-	-
Italy	14,483	16,615	939	813	410	2,502	-	-	-	3,362	-	740	5,717
Netherlands	17,155	12,560	183	838	-	152	1,768	1,149	-	12,273	128	362	302
Poland	6,014	1,740	-	-	-	-	-	6,014	-	-	-	-	-
Spain	4,272	5,230	-	-	2,996	-	-	-	-	-	-	1,276	-
Portugal	6,750	7,778	-	-	6,750	-	-	-	-	-	-	-	-
Sweden	19,298	22,693	2,304	3,803	-	-	-	-	3,461	4,722	134	961	3,913
Switzerland	8,064	5,188	-	1,074	-	-	-	-	-	950	-	-	6,040
United Kingdom	102,114	86,137	18,212	2,921	-	86	10,695	5,489	-	50,931	6,422	158	7,200
U.S.S.R.	92,216	31,575	-	-	-	-	-	16,764	75,452	-	-	-	-
Other Countries													
Belgian Congo	264	226	-	-	-	108	-	-	-	-	-	-	156
French Cameroons	1,598	3,117	-	-	-	1,598	-	-	-	-	-	-	-
Fr. Equat. Africa	82	80	-	-	-	-	-	-	-	-	82	-	-
Ghana	302	597	-	-	-	302	-	-	-	-	-	-	-
Hong Kong	179	144	-	-	-	-	-	-	-	-	-	179	-
Israel	52	235	-	-	-	-	-	-	-	-	-	52	-
Liberia	928	1,054	-	-	-	379	-	-	-	-	-	-	549
New Zealand	531	892	-	-	-	-	-	-	-	-	454	77	-
Nigeria	29,320	54,930	-	-	-	27,463	-	1,711	-	-	146	-	-
Portuguese E. Africa	776	1,280	-	-	776	-	-	-	-	-	-	-	-
Portuguese W. Africa	1,069	1,692	-	-	1,069	-	-	-	-	-	-	-	-
Turkey	53	52	-	-	-	-	-	-	-	-	-	53	-
Union S. Africa	1,490	2,817	-	-	-	-	-	-	-	-	1,490	-	-
Others	25,916	20,668	355	5,187	1,667	324	842	1,863	3,821	2,930	1,561	3,593	3,773
TOTAL Jan.-June /59	600,148	445,215	29,085	32,850	27,919	33,105	87,527	86,891	92,323	117,042	24,503	15,851	53,052
TOTAL Jan.-June /58	562,843	410,888	25,763	28,515	39,074	33,754	65,582	72,055	107,453	(1)	29,331	14,675	146,641

(1) Figure not available, included with "other products".

Current Reading

"Canada Year Book, 1959," (Dominion Bureau of Statistics, Information Services Division, Ottawa, Can. Available from the Department of Public Printing and Stationery, Ottawa. $5.00).

The official statistical annual of the resources, history, institutions and social and economic conditions of Canada, this publication summarizes a great mass of detailed statistical information concisely within the covers of one volume, and supplements this with data from other Departments of the federal Government and from the provinces. Chapter 13, devoted to fisheries and furs, includes a complete review of Canada's commercial fishery resources, with explanations of their administration, conservation and development. The statistics presented cover primary production and the fish processing industry.

Special feature articles in the current edition of the Year Book include "The Atlas of Canada," "The Climate of Canada," "The International Geophysical Year," "Integration of Postwar Immigrants,""Canada's Mineral Industry," "The Fisheries Research Board," "Steel in Canada," and "A History of Canadian Journalism 1900 to 1958."

In addition, other features have been introduced and extensive revisions made in the textual and statistical material of the various chapters, including such subjects as immigration, vital statistics, public health and welfare, scientific, medical and industrial research, forestry, power development, mineral production, manufacturing, the labour force, prices, public finance, banking, insurance, transportation and communication, domestic marketing, foreign trade, national income and expenditure and Canada's international investment position. Numerous charts graphically portray significant trends in the developing Canadian economy during 1958-59. The volume is lavishly illustrated with photographs in colour and black and white, and there are numerous maps.

"An Introduction to the Sea Fishes of Malaya," by J.S. Scott, (Issued by the Ministry of Agriculture, Federation of Malaya, The Government Press, Kuala Lumpur).

This work is offered as a representative selection of the sea and estuarine fishes of Malayan waters. The author says that most of the fishes described are fairly common and may be encountered at the larger fish markets or landing places. Other, rarer, species are included because they are peculiar or previously unrecorded in Malaya. A total of 294 species are described and most of them are illustrated, providing contents of much interest.

"Increasing Profits from Fish," by John P. Carroll, Kirby M. Hayes and Paul Paradis, (Publication No. 340, Extension Service, University of Massachusetts, Amherst, Mass.).

This booklet, a co-operative effort of the New England Extension Services Marketing Education Programme, the University of Massachusetts and the U.S. Department of the Interior, Bureau of Commercial Fisheries, explains how to increase profits from the sale of fishery products. It is designed for retailers, and outlines briefly and concisely the points to be observed in buying, storing, selling, and increasing sales of top quality fish in order to attract customers. It stresses the fact that quality is the silent salesman that produces results. Once top quality fish has been stocked, the next step to increased fish sales is to develop a system of handling at the retail level which will maintain this quality. The merchandise must then be displayed for maximum sales impact. The authors, experts in merchandising and food technology present their instructions clearly and briefly, and illustrate them with humorous line drawings.

"Fishing, a Bulletin for Commercial Fishermen," (Fisheries Branch, Province of Manitoba Department of Mines and Natural Resources, Winnipeg, Man.).

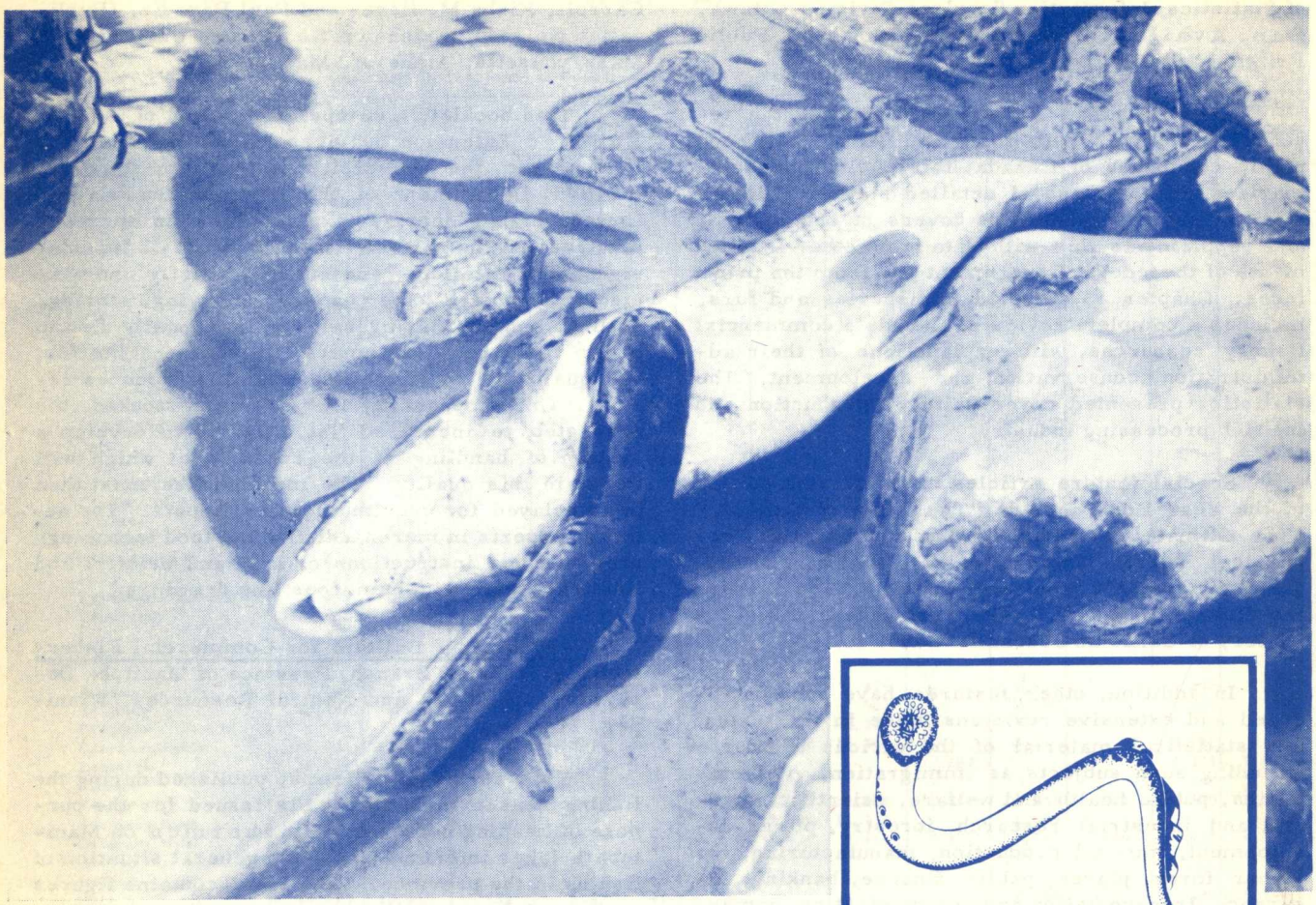
This series of bulletins, published during the fishing season in Manitoba, is issued for the purpose of keeping commercial fishermen on Manitoba's lakes informed about the general situation of fishing in the province. Each issue contains figures on the catch, marketing news, new ideas in equipment and techniques, and reports on the biological studies being carried out. Regulations with regard to mesh sizes and season dates are also published, together with other information which can help the fisherman. The bulletins are attractively printed and well illustrated.

"The Goldeye, Amphiodon Alosoides (Rafinesque), in the Commercial Fishery of the Red Lakes, Minnesota," by Marvin D. Grosslein and Lloyd L. Smith, Jr. (Fishery Bulletin 157, U.S. Fish and Wildlife Service, Washington, D.C. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington 25, D.C. $0.15).

The commercial fishery in the Red Lakes in north-central Minnesota is a major industry of the local band of Chippewa Indians. The marked decline in the production of goldeyes from this region in recent years has resulted in an economic loss to the fishery. This fact led to the present study, which deals with some phases of goldeye life history and factors influencing abundance of the species.

E. R. Clark
Deputy Minister.

If undelivered return to:
Department of Fisheries of Canada
OTTAWA



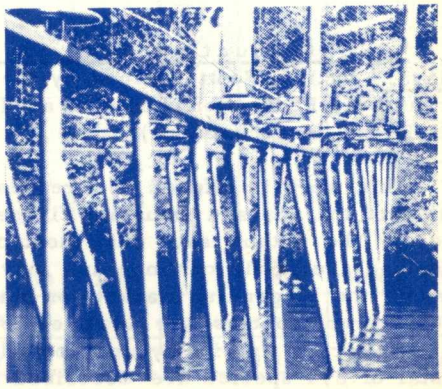
THIS FISH has been killed by the lamprey that still clings to it. Lampreys have caused collapse of lake trout stocks in two Great Lakes, now threaten a third. But under the Great Lakes Fishery Commission the Department of Fisheries of Canada, through the Fisheries Research Board, and the United States Fish and Wildlife Service have joined forces to meet and beat the lamprey menace.

Murder threatens an industry

IN LAKES HURON AND MICHIGAN lake trout stocks have collapsed. Sea lampreys, grey-black eel-like creatures that feed on the blood and body juices of fish, have been the main cause. Now lampreys are in Superior—another Great Lake is threatened.

To find a solution to the lamprey menace, Canada and the United States have joined forces in the Great Lakes Fisheries Convention. Scientists of both countries are striving to find ways of keeping the lamprey under control. Already, extensive field work is being carried out in northwestern Ontario waters.

A great deal of experimentation and research has still to be done before the lake trout fishery in the Great Lakes can be saved and restored. But this work is being carried out as quickly and efficiently as humanly possible.



THIS ELECTRICAL BARRIER prevents adult lampreys from reaching suitable spawning grounds. Other types of barriers—both electrical and physical—have been erected across streams that flow into Lake Superior. Scientists are experimenting with still other control methods, delving into the lamprey's environment and habits. The fight against the lamprey is being waged 24 hours a day.

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