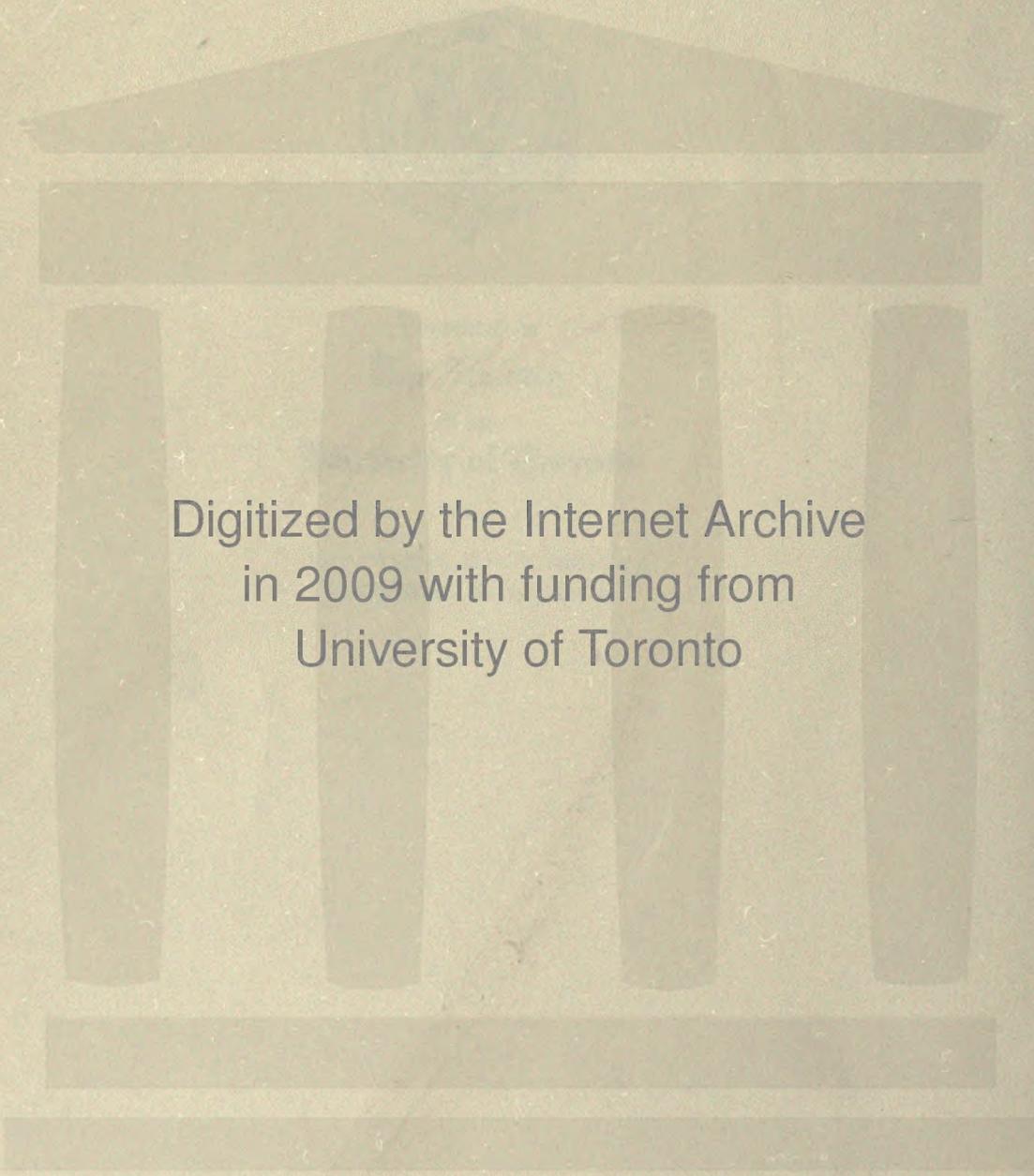


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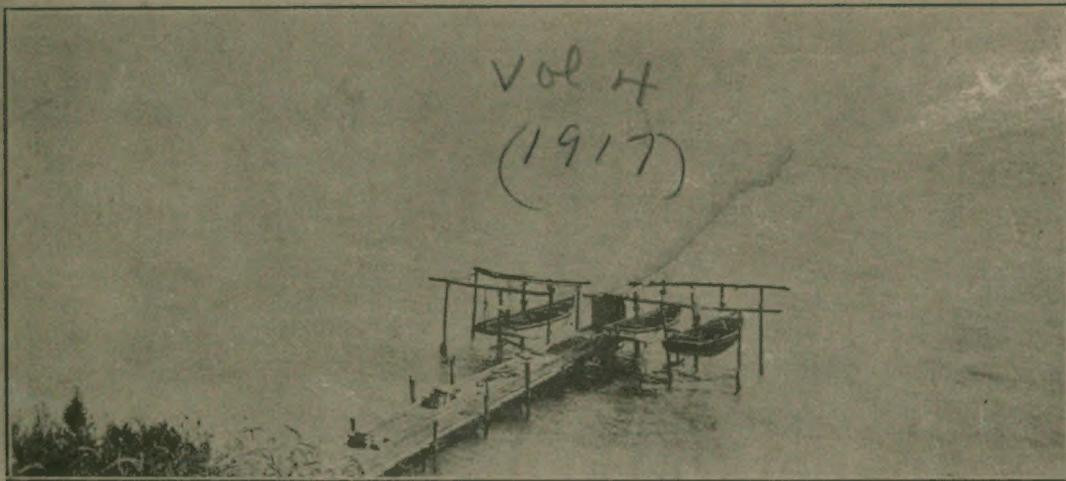
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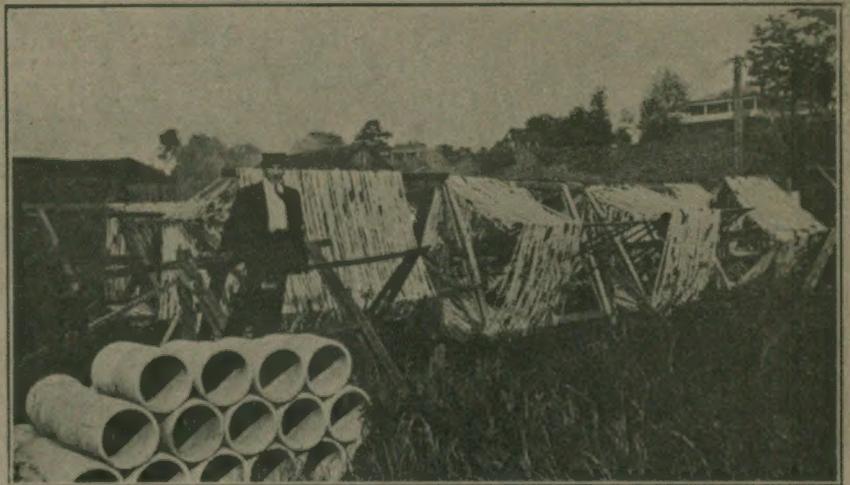
Vol. IV.

MONTREAL, FEBRUARY, 1917

No. 2



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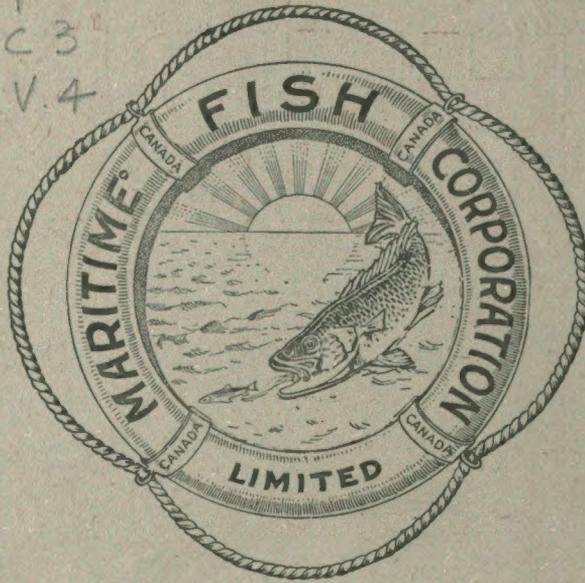
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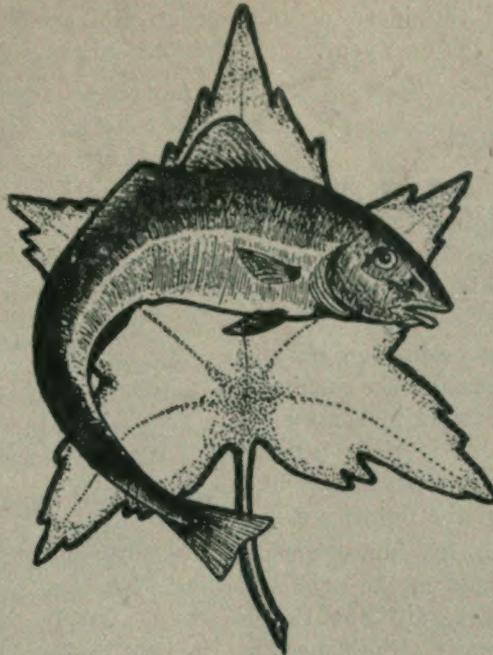
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THE CANADIAN FISHERMAN

A MONTHLY JOURNAL DEVOTED
TO THE COMMERCIAL FISHERIES
OF CANADA AND NEWFOUNDLAND
THE SCIENCE OF THE FISH CULTURE
AND THE USE AND VALUE
- OF FISH PRODUCTS - -



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F. WILLIAM WALLACE
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Published on the 24th day of each month. Changes of advertisements should be in the publisher's hands ten days before that date. Cuts should be sent by mail, not by express. Readers are cordially invited to send to the Editor items of Fishery news, also articles on subjects of practical interest. If suitable for publication these will be paid for at our regular rates.

Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, JANUARY, 1917

No. 1

January Fish Day Calendar

1917		JAN.				1917	
Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	
	1	2	3	4	5	6	
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30	31				

Every Tuesday is a Fish Day Now!

MONDAY, JANUARY 29TH C. F. A. ANNUAL MEETING.

ANNUAL MEETING, CANADIAN FISHERIES ASSOCIATION.

The second Annual Meeting of the Canadian Fisheries Association will be held in Montreal on Monday, January 29th, 1917. The Committees will convene in the morning at the Windsor Hotel, and business will continue throughout the day. In the evening, an informal dinner will be held among the Association members only—no guests being invited.

The question of a meeting place has been carefully discussed by the Executive Committee and expressions of opinion were asked as to the advisability of holding the Annual Meeting in either Halifax, Toronto or Ottawa. The consensus of opinion showed, that, in order to obtain a good attendance of members during these war-time days, Montreal would be the best place to hold the meeting.

There are many very important matters to be discussed and acted upon, and a good attendance is expected. Members! Don't forget Monday, January 29th, at the Windsor Hotel, Montreal.

ELECTION OF OFFICERS, C. F. A.

The nominations for the 1917 Officers and Directors of the Association are now in the Secretary's hands. Owing to the number of officers nominated, many failed to secure the ten and five nominations necessary for Officers and Directors respectively. As a consequence, ballots will not be sent out, but the nominations will be put up before the members at the Annual

THE EDITOR AND PUBLISHERS
OF THE CANADIAN FISHERMAN
WISH ALL THEIR READERS A
HAPPY AND PROSPEROUS NEW
YEAR.

Meeting and the Officers elected there and then.

A well attended meeting is expected as it is necessary for the new Executive to have the ideas of the members in the campaign plans for the new year.

NATIONAL SERVICE.

A campaign for National Service is at present being instituted throughout Canada. Briefly it is a census of the man power of Canada—a tally of all male Canadians between the ages of 16 and 65, and the trade they are working at for a living.

The National Service campaign foreshadows a full utilization of the country's resources for the successful prosecution of the war. Men engaged in necessary occupations will be expected to work to their fullest capacity. Others, not so engaged and physically fit, will be expected to join the ranks of the fighting men.

We strongly urge every fisherman, fish-house worker, canner, and those actively engaged in the production and distribution of fish foods, to fill out their National Service cards and send them in. The fisheries are necessary to the life of the country. It is possible that the Fishing Industry will be asked to "speed up" production to supply food for the people at home and overseas. The Government can only do this effectively when it has a list of the men engaged in the industry.

There are doubtless many men who have been professional fishermen or fish workers at one time and who are at present in some other occupation. These men should mention the fact that they are fishermen on their cards and that they are willing to work again as fishermen if called up to do so.

The war is not won yet. We are fighting a mighty and well organized foe—an enemy imbued with ruthless determination to win and a stubborn defiance of facts to keep them fighting. The Allies will beat them eventually, but it will only be when EVERY MAN, WOMAN AND CHILD IN THE COUNTRY IS ENROLLED TO DO THEIR BIT IN NECESSARY WORK. The drones and non-producers, the caterers to pleasure and luxury, the parasites, slackers and loafers will be expected to get into the khaki or navy blue, or the overalls of the munition workers.

Once again! Fill out your card and send it in!

A NEW NAME FOR BLACK COD.

Our worthy contemporary, the "Pacific Fisherman" states that the dealers of the Pacific Coast are looking for a new name for the black cod. The reasons assigned are that the black cod, so-called, is not even a member of the cod family, nor has it the flesh constituents of the latter. The fish in question is a real fine food-fish and are extremely plentiful in the North Pacific, but its qualities are only now being appreciated.

In the overseas fish orders for the Canadian and British soldiers, shipments of black cod are now being in-

cluded. Some time ago, we ventured to prophesy that black cod will constitute one of the most important fisheries of the Pacific coast and that it will rival the halibut fishery. We still think so.

As this fishery is carried on by American and Canadian fishermen and is a fishery common to both, why not make the new name typical of the two countries. How would "UNICA" do? The word is made up of "United States" and "Canada", and would be in etymological consistence with the two words. With the other fish names of "tuna", "bonita", "barracuta", etc., "unica" will not sound so strange.

We can imagine "filleted unica"; "smoked unica"; "canned unica", and so on. We pass our humble suggestion on to the powers that decide.

WHAT WE WOULD LIKE TO SEE DURING 1917.

A Government Publicity Department for the Canadian Fisheries.

Fish eaten every day in the week.

Our fishermen with subsidized engines in their boats and the present Fishing Bounty used for the purpose.

Technical Education for our fishermen.

The Pickled Fish Inspection Act made compulsory.

The dog-fish introduced as "gray-fish" on our own markets.

Every man in the fishing industry a member of the Canadian Fisheries Association.

The value of our fisheries at the fifty million mark.

The Commission of Conservation restrained from meddling with our fisheries and a "live" Commission appointed to look after them and receive value for money spent.

Plans for a fishermen's Naval Reserve formulated.

A better appreciation by the Canadian public of fish and fish foods other than salmon, halibut, cod and had-dock.

Every fish on the hook, or in the net, marketable.

Good prices for the fishermen and fair profits for the dealers.

The war ended with a sweeping victory for the Allies.

Our soldiers and sailors coming home victorious.

High-line catches everywhere.

THE CANADIAN FISHERIES DURING 1916.

Undoubtedly, one of the greatest events in our fishing industry during the past year has been the overseas orders of Canadian fish for the troops. Since the appointment of a Canadian fish man, Mr. Hugh A. Green of Saskatoon, this business had developed to respectable proportions. In addition to the Canadian orders for troops at home and in England, Major Green

has secured the attention of the British War Office to Canada's ability to supply fish, and a trial shipment of one million, five hundred thousand pounds of frozen fish has gone overseas and was landed in good condition. Other orders will follow, and enquiries have come in from other Allied Governments.

The Canadian public has turned more than ever to fish as a food, and the publicity work of the Canadian Fisheries Association and the Fisheries Department has greatly stimulated the demand. As a result, certain varieties failed to meet with the call and became high in price. There are numerous other species in plentiful supply and low in price which the consumers could have and which are every bit as good food as the halibut, salmon, market cod and haddock so much in demand. Even the varieties named could have been purchased at lower prices were the consumers not so discriminating as to demand fish of certain exclusive weights and sizes. Large halibut, scrod haddock and small cod were easily procurable at fair prices, but the demand was for the selected fish.

The Lunenburg salt fishing fleet had a banner year—the largest on record. The catch was 218,060 quintals value at \$1,635,505. Halibut on the Pacific showed up scarce and the fishermen secured record prices for their catches, which caused a rise in price to the consumer.

During the year, the B. C. Packers' Association unfortunately lost two of their fishing steamers—the S.S. "Onward Ho" and "Roman"—both of the finest type of steam halibuters on the Coast. The "Onward Ho" vanished last winter with all hands somewhere in the Gulf of Alaska, and the "Roman" struck on an Alaskan reef and sank on November 18th. With the loss of these ships, the halibut fishery was depleted by their catches.

On the Atlantic coast, two steam trawlers have been added to the fleets of Canadian companies. The S.S. "Rayondor" has been purchased by the Maritime Fish Corporation, Ltd., and is operating out of Canso, N.S., and the S.S. "Triumph" (formerly of Vancouver, B. C.) has been purchased by the National Fish Company of Halifax. These two are the only steam trawlers operating out of Canadian ports, and both have been instrumental in keeping up the supply of fish.

The value of Canadian fisheries for the year ending March 31st, 1916, amounted to \$35,860,708—an increase of \$4,596,077 over the previous year. The statistical year 1916-7 should bring the figures over forty millions.

Taking it all round, the Fishing Industry has been prosperous. May it be doubly so for the year now beginning.

WHAT'S THE MATTER WITH FISH?

A correspondent brings our notice to a tender for provisions for H. M. Dockyard, Esquimalt, B. C., called for by the Department of the Naval Service, which is also the Fisheries Department. There are twenty-seven varieties of eatables called for, but not one fish item.

While the food called for is practically of the non-perishable kinds, yet we'd like to see canned salmon, sardines, herring, chicken haddie, codfish, etc., getting a look-in.

Probably the Department intend to economize on fish and will provide the seamen of the Navy with hooks and lines wherewith to catch their own.

Well, well, we suppose the day will come when the Fisheries will cease to be the left hand orphan of the Government, and when the millenium comes along we'll get all we're looking for. At present, the Naval Service Department, whose ward we are, hands out its favours to strangers, while we, like Oliver Twist, will howl in vain for more.

PISCATORIAL PARAGRAPHS.

The S.S. "Manhattan" of the New England Fishing Co., Ltd., Vancouver, B. C., is being housed in amidships for winter fishing. The "New England" of the same company is being fitted as an oil burner at a cost of \$20,000.

• • •

The Government has had an Order-in-Council passed whereby Canadian steam trawlers will be permitted to fish in Canadian Atlantic waters outside the three mile limit for a certain period each year—said to be from January 1st to May 1st. Up to the present, no steam trawler can fish in Canadian waters except twelve miles offshore. The Order has been passed to allow Canadian trawlers access to the inshore fishing grounds that production may be kept up during the winter months.

• • •

The Golden Ray Fishing Company, Ltd., have been granted incorporation papers to "carry on business as fishermen, producers and canners of fish and lobsters, to operate vessels, etc." The Company have a capital stock of \$20,000, in shares of \$100 each. The chief place of business is to be Montreal.

• • •

A company to engage in the fishing and marketing of white-fish has been formed in Montreal to locate on Lake Abbitibi. The promoters of the concern have purchased their nets and gear and will commence operations this winter.

• • •

Three steam trawlers passed through the port of Montreal this Fall bound for Boston. These vessels were built in Wisconsin for the Bay State Fishing Company of Boston.

Stormy weather last month did an immense amount of damage to the lobstermen's gear along the Nova Scotia coast. The loss is estimated at \$100,000.

• • •

The Boston fishing schooner *Titania* sailed from Gloucester last month on a mackerel fishing trip off the South African coast. She will call at Cape Town for provisions. This is one of the longest fishing voyages undertaken by a schooner since the days of mackerel fishing off the coast of Ireland.

• • •

The lobster season opened on the Nova Scotia coast on December 15th. More traps were put in the water than for many years past. The recent storm, however, comes as a bad blow to the industry, but it is to be hoped that the lobstermen will come through all right when the season finishes.

• • •

Mr. H. C. Walby, late of the Canadian Fish & Cold Storage Co., Prince Rupert, B. C., has gone into business in New York handling Halibut. Mr. Walby is at present on a visit to Norway.

• • •

Major Hugh A. Green, Director of Fish Supplies, will be in Canada for another month at least. Mail address will be Militia Department, Ottawa, Ont.

• • •

McLaughlin Bros., of Seal Cove, Grand Manan, N. B., are putting up an exceedingly palatable fish food in their boneless smoked herring. The firm informs us that they have just filled an order for 2,000 boxes for a Chicago firm, and have been highly complimented for the cleanliness and the manner in which the goods were put up.

• • •

Firms contemplating the packing of Scotch cured herring next season should place their orders for barrels now. We can recommend the London & Petrolea Barrel Co., Ltd., and the Chas. Mueller Co., Ltd.,—both of which advertise in this magazine.

• • •

Mr. Harry Rowlings, representing Messrs. Farquhar & Co., Halifax, in Newfoundland, died of blood poisoning there recently. Mr. Rowlings belonged to Halifax and was highly esteemed in the Island Colony.

• • •

The lobster catch for 1916 was eminently satisfactory in spite of threatened adverse conditions. The weather and the catch was good, and the catch showed an increase over 1915. Prospects for the future are hazy owing to the probability of restricted imports into the Allied countries. While the war has benefitted other branches of Canada's fishing industry, the lobster is subject to public opinion as to whether it can be classed as a "food" or a "luxury". This uncertainty, and the liability of embargo against it, tends to give the packers some concern. However, they, like good sportsmen, are taking a chance and going ahead with the trapping and canning.

A SCHEME TO EXPLOIT B. C. FISHERIES FOR ENGLAND'S FOOD SUPPLY.

Mr. Moreton Frewen, writing from Sussex to the *Daily Telegraph*, confesses to be one of those who see in cold storage salvation from food shortage, and he emphasizes this also with regard to fish supply. The situation, he says, points to the necessity of cold storage plants in every town of 10,000 souls. He touches upon Canada's vast fishery resources, and instances that at the terminal port of Prince Rupert the receipts of salmon for the first 20 days of September were over 5,000 tons and of halibut 1,567 tons, valued at the local cold stores at £6,950. He adds:—"A very shapely 'spring' salmon, *Salmo oncorynchus*, weighing 4 lbs., was forwarded from Rupert by Mr. Peter Wallace to Messrs. Spiers and Pond, and was on exhibition in their Ludgate Hill establishment. These fish, were freights at all normal, can be delivered, iced, not frozen, for 7d. a lb. in London, and, although they do not compare in quality with our own *Salmo salar*, are still an excellent food fish."

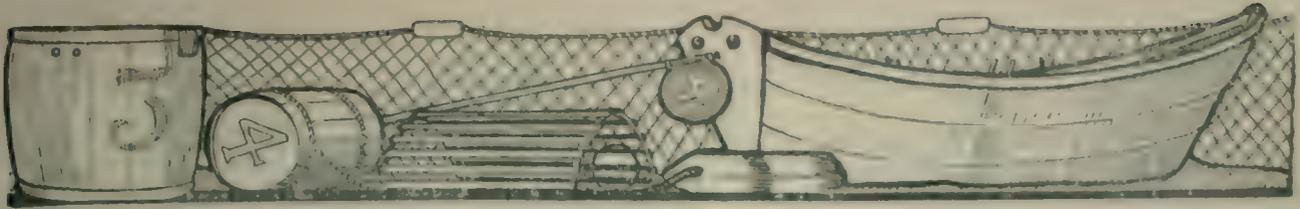
Many may not agree with Mr. Frewen's dictum that the nationalization of the Empire's fisheries is desirable. He argues that the daily receipts of fish at Prince Rupert, the central port for the British Columbia Fisheries, is already some 350 tons daily, chiefly halibut and salmon, and if the State would offer to pay present prices, namely 4d. per lb. for halibut, and 5d. for salmon, and would arrogate to itself a monopoly, with these as the maximum prices, it would be easy with this advertisement of an unlimited cash demand, to secure a full trainload—a thousand tons daily—at that one port.

The correspondent states that he has ascertained that a rail and steamship rate of 1d. per lb. from Prince Rupert via Montreal to Liverpool, would be liberal, indeed generous. If through its agencies in every small town Great Britain distributed such fish supplies at a profit of 1d. per lb., it might in a short time secure a rent from its vast ocean pasture of twenty to thirty millions a year on a consumption of 6 ozs. per day.

BUY FROZEN FISH UNTHAWED.

The importance of fish as a substitute for meat has been strongly urged; and here again the inertia of habit stands in the way. One good tip for householders who buy fish in the market at a distance from the sea has recently been given out by the storage expert of the Department of Agriculture, however, she says that frozen fish are kept in perfect condition and are perfectly wholesome; but that they should be cooked immediately after thawing. Now the average dealer, in order to make his wares look more attractive thaws out the fish before exposing them for sale, and they immediately begin to deteriorate. Insist therefore upon having fish that are still frozen if you live inland. Frozen halibut is now shipped from Alaska to Boston and from there reshipped all over the Country without deteriorating in the least as long as the fish remains in its thin envelope of ice.—*Portland Express*.

It is stated that articles such as sardines, salmon, pickles, etc., can be obtained in Johannesburg, South Africa, cheaper than landed cost, owing to surplus stocks being heavy.



TO OUR MEMBERS:—

The Canadian Fisheries Association starts the New Year with every confidence in the future of our Industry. During the year which has just come to a close the output and value of fish produced has been the greatest in the history of our country.

The Canadian people are now beginning to realize that fish is a healthy, nourishing and palatable food, which is produced in Canada and is also economical, while providing greater variety at a cost which is within reach of all classes.

Our export trade to Europe has increased by leaps and bounds. Large quantities have been forwarded to supply the Imperial, as well as Canadian troops. Further shipments will be sent during the New Year and it is our patriotic duty to assist in this and every other possible way to bring the war to a successful conclusion.

The increased demand has resulted in somewhat higher prices, thereby benefiting the fishermen and producers, but the money expended for fish remains in Canada and is circulated through various avenues of trade to the advantage of the general public.

Fish is now recognized as a staple article of food and a steadily increasing demand is sure to result. In order to cope with the new conditions obtaining in Canada, it is absolutely necessary that the supply should be increased and our slogan for the future must be "Production" on a larger scale to cope with and provide for the greater demand.

There are many problems entailed which require the careful consideration of all who are in any way engaged, either directly or indirectly, in the fisheries of Canada, and I make an earnest appeal to all our members to attend the Annual Meeting in Montreal on January 29th, when matters of interest will be discussed and the future policy of our Association will be decided on.

Make note of the date and arrange to be present, thereby helping the good cause in a practical manner. Your officers have many important matters to offer for consideration and decision. Will you not second their efforts, show your active support and prove your appreciation of their work by making any sacrifice required to be present? Will you come?

Montreal, January 2, 1917.



W. J. Byrne

President.



Lunenburg Salt Fishing Fleet's Record Year

The Lunenburg salt fishing fleet landed 218,060 quintals valued at \$1,635,505 during the season just closed. The average catch per vessel was 2,060 quintals. The fish sold at \$7.10 for the spring catch and \$7.80 for the summer. The schooners "James Burton Cook," Captain Abram Cook, and "Delawana," Captain Benjamin Cook, were both high-line with 3,800 quintals each for the season.

The 1916 season is a record considering that fewer vessels were engaged, and though the catch was below that of other years, yet the stocks made and the fishermen's shares are considerably higher than previously—the crews of some vessels sharing over \$700 each for the five months fishing.

One vessel, the "Lucille M. Schnare" was lost by collision off Newfoundland. Seven men were drowned from the fleet during the season.

The following is a list of the vessels engaged, their skippers, and catch in quintals:

J. Burton Cook, Cook	3,800
Frances W. Smith, Mossman	3,150
Vivian A. Smith, Knickle	2,500
Arcola, Knickle	2,100
Donald L. Creaser, Creaser	2,500
Lucille B. Creaser, Creaser	2,000
Elsie L. Corkum, Moser	1,850
Vera E. Himmelman, Conrad	1,550
Lucille M. Schnare, Schnare	800
Warren Winters, Allen	1,900
Muriel E. Walters, Walters	2,700
R. L. Borden, Himmelman	2,900
W. H. Smith, Nass	1,850
Mary Flemming, Silver	1,900
Lottie Silver, Silver	1,400
Gigantic, Parks	1,650
Elsie M. Porter, Eisnor	1,750
Revenue, Zinck	1,850
Louis H. Smith, Westhaver	1,900
John Parker, Horn	1,400
Frank J. Brinton, Gilfoye	2,000
Pearl Beatrice, Hubley	500
Allison H. Maxner, Maxner	2,100
Minnie Mosher, Bowers	600
Tipperary, Walters	1,550
Golden West, Getson	1,000
Amy B. Silver, Silver	2,500
Douglas B. Conrad, Conrad	2,500
J. W. Margeson, Conrad	2,100
Clintonia, Mack	2,600
M. M. Gardner, Bachman	2,900
Lilian B. Corkum, Corkum	3,270
Carrie L. Hirtle, Hirtle	2,700
Mary D. Young, Spindler	2,630
J. D. Hazen, Himmelman	2,850
Itaska, Ritcey	2,500
H. H. McIntosh, Wynacht	2,470
Delawana, Cook	3,800
Arcania, Hebb	2,200
F. M. Toro, Corkum	3,350
W. C. Smith, Selig	2,200
Hawanee, Cook	2,850
Benevolence, Corkum	2,750
Doris V. Myra, Myra	2,550

Araminta, Creaser	2,220
Uda A. Saunders, Spindler	2,350
Associate, Bachman	1,900
Marian Adams, Knickle	2,000
Cecil Beck, Heisler	2,500
Jennie E. Duff, Himmelman	1,950
Annie L. Spindler, Ritcey	2,100
Marjory McGlashen, Wambach	2,850
W. T. White, Knock	3,300
James Douglas, Romkey	3,000
Lauretta Francis, Spindler	2,775
Mantanzas, Oickle	2,300
Henry W. Adams, Zinck	2,650
Mary D. Young, Spindler	2,600
John B. Young, Himmelman	2,450
E. B. Walters, Walters	2,650
A. H. Hubley, Hubley	450
C. M. Walters, Walters	1,600
Cento, Fralie	1,600
Abacenia, Romkey	900
Loyola T., Fralick	1,250
Dorothy L. Sarty, Sarty	800
Clark S. Corkum, Corkum	900
Monarchy, Lohnes	800
W. C. Robertson, Publicover	1,900
Review, Bushen	850
Lucille Colp, Colp	2,700
Carl S., Schmesiiser	800
Otokio, Ernst	1,300
Pasadena, Ernst	1,350
Marjory Bachman, Bachman	1,900
Phylis Westhaver, Westhaver	2,100
Mattawa, Zinck	1,000
Earl Grey, Shupe	1,950
Marian Mosher, Mosher	2,700
Muriel Winters, Winters	2,700
Lucille M. Smith, Beck	2,650
Ada M. Westhaver, Mason	1,850
Elsie M. Hart, Corkum	3,000
Benjamin C. Smith, Smith	2,100
A. H. Whitman, Conrad	2,000
Grace Hilda, Conrad	1,500
W. C. McKay, Deal	2,700
Assurance, Wharton	2,800
Granite, Richards	2,500
Caranza, Conrad	1,950
Doris L. Corkum, Corkum	2,350
Marian Silver, Silver	1,850
Evelin Miller, Miller	2,450
Itaska, Ritcey	2,500
Jennie Ritcey, Ritcey	2,900
Dorothy Adams, Tanner	2,400
Donald A. Silver, Creaser	2,900
Leta J. Schwartz, Schwartz	1,600
Orinoco, Sarty	1,100
Elsie Burdett, Wentzel	1,300
Marian Helena, Burgoyne	1,400
Alfarata, Whynot	1,200
Atacama, Wentzel	1,600
Emily Selig, Selig	300
Guide, Getson	1,600
Marina, Greek	500
Total catch.	218,060

Lobster Matings; A Means of Conserving The Lobster Industry

By DR. A. P. KNIGHT.

During the summer of 1914 the writer, working under the auspices of the Biological Board of Canada, attempted to rear lobster fry to the crawling stage, using the now familiar apparatus of the Rhode Island Commission. The site chosen for the repetition of the celebrated Wickford experiments was St. Mary's Bay, Digby Co., Nova Scotia. The attempt proved a complete failure due chiefly to the extreme cold water (50 deg. F.) and to the extensive development of diatoms which soon closed up the mouth parts of the fry and caused an exceedingly high death rate.

However, an experiment that was at first supposed to be a very minor one compared with lobster rearing turned out to be the major one. It was this. About the middle of June, 47 females and 15 males (all known as "commercial lobsters," because the females when caught in fishermen's traps have no "berries" on them) were placed in a wooden pound enclosing an area of 10 feet by 20 feet. The slats of which the pound was built were about 4½ feet long, 3 inches wide and 1 inch thick. It was intended to retain the animals over winter for the purpose of elucidating the old question of whether or not adult females moult one year and extrude eggs the next, or whether they extrude eggs every year (when mating conditions are favorable) and only moult occasionally as they grow older.

On the 12th of August the whole of the 62 lobsters were dipped up to see what condition they were in. They all appeared healthy, and 36 per cent of the females carried eggs. Dr. Herrick in his well-known book on the American lobster quotes from Vinal Edwards to the effect that the percentage of berried lobsters caught by fishermen off the Massachusetts coast was 12 per cent. for the autumn of 1893 to June 30, of 1894. Careful inquiries among both cannery and fishermen of the St. Mary's Bay area elicited the information that only about 1% of the females caught in fishermen's traps carried eggs. And then the question arose: How is it that in fishermen's traps only one female in every hundred carries eggs, whereas in our mating pen thirty-six out of every hundred carry eggs? The problem did not grow any simpler when it was found that by the end of September the percentage in our pen had risen to 64 per cent. The 17 females which did not extrude eggs were removed from the latticed pen and the 30 which bore eggs, representing the 64 per cent., were kept over winter in a compartment by themselves. On April 7, 1915, the 30 were all found to have the full complement of eggs upon them.

Subsequently, in June and early July they all hatched out their eggs, and being kept in compartments by themselves 9 of them were found to have extruded eggs in late July and August. These 9 were removed from the pen, the remaining 21 being retained, but unfortunately one corner of the enclosure gave way, allowing most of the 21 to escape and mingle with others, so that it was impossible to know how many more of them did extrude eggs.

Mating experiments were resumed during the summer of 1915, but were not so successful as those of 1914. Only 40 per cent. of the females extruded eggs, and the eggs were most of them unfertilized. Probably the sole reason for this was lack of males. During the early part of the summer we had only one male to mate with 51 females. Later on, we were fortunate enough to secure 25 more males, but half of these died from accidental poisoning by paint on the inside of our mating pens. Moreover, many of the remaining males were decidedly undersized—9½ to 10 inches in length. But perhaps the most fundamental reason for the poor showing of 1915 lay in the fact that the large majority of the females had been retained in the pound over winter, and as a consequence had suffered considerably in general health. Few of them had moulted and their "shells" were covered with dark brown algal growths that I have always seen upon lobsters when in lengthened confinement, but never upon those which were taken directly from the open sea.

In 1916 the Biological Board authorized an extension of the mating experiments to two other places on the Maritime coast, namely, St. Andrew's, New Brunswick, and Pictou, on Northumberland Straits. The results to date, 25 "berried" out of 105 in St. Mary's Bay, 8 out of 22 at St. Andrew's and 14 out of 21 at Pictou, or, expressed in percentages, 25 per cent., 36 per cent. and 66 per cent., respectively.

How do these percentages compare with the percentages of females caught in lobster traps in these same areas? Fortunately, through the courtesy of the Department of Naval Service, Ottawa, we were able to make a close approximation to an answer to this question. At the request of the Biological Board, the naturalist of the Fisheries Branch, Mr. Andrew Halkett, was detailed to spend the summer in going out with lobster fishermen all around the coast, and in collecting statistics as to the total males, total females and percentages of berried females caught in lobster traps. The following is a copy of his summary of results:

Date.	Name of Place.	No. Males.	No. Females.	No. Females which Carried Eggs.	Remarks by Dr. Knight.
April 24, 1916	Tommy's Beach, N.S.	56	58	0	
April 20, 1916	Tommy's Beach, N.S.	26	27	0	
April 28, 1916	Little River, N.S.	23	17	0	
May 2, 1916	Whale Cove, N.S.	25	28	0	

May 3, 1916	White Cove, N.S.	26	19	1	Egg of 1915
May 5, 1916	Tiverton, N.S.	9	20	0	
May 15, 1916	Lunenburg, N.S.	36	35	1	Egg of 1915
May 17, 1916	Port Mouton, N.S.	50	39	3	Eggs of 1915
May 20, 1916	Shag Harbor, N.S.	46	54	0	
May 22, 1916	Shag Harbor, N.S.	88	112	0	
May 23, 1916	Shag Harbor, N.S.	39	70	2	Eggs of 1915
May 24, 1916	Shag Harbor, N.S.	171	158	0	
May 26, 1916	Cape Sable Island, N.S.	68	98	0	
May 30, 1916	Lobster Bay, West Pubnico.	82	73	0	
June 2, 1916	Cape St. Mary's, West Pubnico	66	86	0	
June 6, 1916	Mink Cove, N.S.	34	25	1	Egg of 1915
June 10, 1916	Little River, N.S.	24	28	0	
June 12, 1916	Little River, N.S.	14	10	0	
June 15, 1916	Ostrea Lake, N.S.	16	14	0	
June 16, 1916	Jeddore, N.S.	169	191	6	Saw first eggs hatching 1915
June 20, 1916	Pope's Harbour, N.S.	6	6	0	
June 24, 1916	Pugwash, N.S.	366	352	50	9-10 old, 1-10 new eggs
June 28, 1916	Skinner's Reef, N.S.	56	36	1	Egg of 1915
June 29, 1916	Pictou Island, N.S.	24	39	1	New eggs (1916)
July 10, 1916	Northport, N.S.	111	110	10	9 old eggs, 1 new
July 13, 1916	Shemogue, N.B.	108	95	3	1 egg 1915, 2 new
July 17, 1916	Dupin's Corner, N.B.	50	27	1	Egg 1916
July 19, 1916	Cormierville, N.B.	133	105	0	
July 20, 1916	Chockfish River, N.B.	139	119	1	Eggs new
Aug. 1, 1916	Cape Traverse, P.E.I.	157	158	1	Eggs new
Aug. 2, 1916	Cape Traverse, P.E.I.	134	112	2	Last eggs seen hatching
Aug. 4, 1916	Brae Harbour, P.E.I.	164	108	1	New eggs (1916)
Aug. 5, 1916	Rocky Point, P.E.I.	135	77	1	New eggs (1916)
Aug. 7, 1916	Brae Harbour, P.E.I.	207	118	3	New eggs (1916)
Aug. 9, 1916	West Point, P.E.I.	325	274	5	New eggs (1916)
Aug. 10, 1916	Brae Harbour, P.E.I.	150	100	3	New eggs (1916)
Totals.		3,333	3,004	97 or 3.2%	

Samples of all eggs were sent to me for the determination of the age of the eggs.

Let us compare these results with statistics furnished me by Dr. Hugh M. Smith, the fish commissioner at Washington, as to the number of lobsters taken off the Massachusetts coast.

Dr. Smith is careful to state that the number of berried females is probably understated, because of the carelessness of fishermen in making returns. We are quite certain that the percentages for 1894-95 are too low, because we have Vinal Edwards's catch off Woods Hole already referred to for these same years, showing 12 per cent. of the females as carrying eggs. Does this mean that 88 per cent of the female lobsters off the Massachusetts coast are sterile? If female lobsters moult every second year and extrude eggs in the alternate years, why do not 50 per cent. of them carry eggs? But they do not, as every fisherman knows.

Year	No. Lobsters Above 10½ Inches	Egg-bearing Lobsters	Estimated Females—about Half the Total	Percentages of Berried Females
1888	1,740,850	.....	.....
1889	1,359,645	61,832	679,823 ¹	9% berried
1890	1,612,129	70,909	906,065	
1891	1,292,791	49,973	646,395	
1892	1,107,764	37,230	553,887	
1893	1,149,732	32,741	579,866	
1894	1,096,834	34,897	548,467	6% nearly
1895	956,365	34,343	478,187	7% nearly
1896	995,396	30,470	497,698	6% nearly
1897	896,273	23,719	498,186	

1898	720,413	19,931	360,206	
1899	644,633	16,470	322,316	
1900	646,499	15,638	323,299	
1901	578,383	16,353	289,190	5%
1902	670,245	.....	335,127	
1903	665,466	.....	332,733	
1904	552,290	13,950	276,145	
1905	426,071	9,865	213,235	4.6%
1907 ²	1,039,886	10,348	519,943	2%
1908 ²	1,035,123	9,081	517,561	
1909 ²	1,326,219	11,656	663,109	
1910 ²	935,356	7,857	467,678	1.6%

¹The estimate of females, as half of the totals is mine.—A. P. K.

² Number of lobsters above 9 inches.

The fact is that the biennial theory of moulting and spawning can not be held any longer. In the sixties and seventies when about half the females carried eggs (see Vinal Edwards quoted by Herrick in regard to 63.7 per cent. of the females off No Man's Land being berried) the theory seemed to fit the facts. To-day it does not.

The question to be answered is this: How is it that off the Massachusetts coast in 1910, only about 2 per cent. of the females carried eggs? Even if the figures are not absolutely correct, the general falling off in percentage since 1888 is most marked. In Canada, we have collected no statistics until last year (1916), and Mr. Halkett's returns show that an average of about 97 per cent. carry no eggs. Are these females all sterile? Impossible belief!

For the Canadian coast, therefore, it is clear, that the percentage of females which carry eggs in traps varies from less than 1 per cent. in the Bay of Fundy area (which may be said to include St. Mary's and St. Andrew's) to about 4.2 per cent. in Northumberland Straits; whereas, by mating experiments in these same areas the percentages are increased by an average of 3,000 per cent. in the former and 1,600 per cent. in the latter area.

Early in our experiments this summer the possibility occurred to me that females in the open sea might in autumn carry more eggs than they do in spring and early summer. In other words, many females might for one reason or another lose their eggs during the winter, and thus reduce the percentage to that elucidated by Mr. Halkett. This possibility was tested to some extent during August and September (1916). Through the courtesy of the Minister of Fisheries, the Hon. J. D. Hazen, I was permitted to fish for lobsters from August 19 to August 31, and found the percentage to 2½ per cent. for the Pictou area. Fishing was again resumed during the last four days of September, when the percentage was found to have increased to 5.6 per cent. Moreover, during September we had 25 males and 25 females confined in the mating pen, and although the enclosure gave way at one corner and allowed some of the lobsters to escape, nevertheless 13½ per cent. of the females were found to have extruded eggs. Here the increase by mating is quite clear.

While I dislike theorizing at this stage in the experiments, I may be permitted to suggest that probably the majority of female lobsters extrude their eggs every year; but that as the total males and females are now greatly reduced through over-fishing and relatively widely separated from each other in the open sea, there is less copulation than formerly, with consequent lack of fertilization of eggs. Being unfertilized the eggs soon "go bad," and drop off. On the other hand, mating brings the sexes together with a resulting increase in the numbers of females carrying fertilized eggs.

We may safely conclude, therefore, that the efficacy of mating as a means of increasing the number of berried females is fairly well established, on the supposition, of course, that the catch of berried females fairly represents the number of berried females in the bottom of the sea. At any rate, the results amply justify further experiments on a large scale, and if further results prove as successful as those of the past three years, they far surpass the results of either lobster hatching or lobster rearing as a means of conserving the lobster industry.

REMOVING A FISH BONE.

A writer in "The Medical Times" is authority for the statement that a simple and almost invariably effective way to remove a fish bone or other substance lodged in the throat is to give the patient a pint of milk, and forty minutes afterwards an emetic of sulphate of zinc. It may be added that the caution of a physician is to eat fish always by itself—that is, putting nothing else in the mouth at the same time, even a bit of bread or potato. In this way the presence of a bone is quickly detected before it has a chance to get beyond control.

A SALES CABINET FOR FISH.

There seems no room for doubt that one of the outstanding obstacles in the way of increasing the demand for fresh fish is the unattractive manner in which fish are displayed for sale in the retail stores.

With a view to inducing the retailers in their own interests, as well as in the interests of their customers, to use an attractive and also highly efficient method of displaying their fish, the Fisheries Department of Canada has decided to prepare for free distribution, a complete plan and specification of an attractive and comparatively inexpensive refrigerator case or silent salesman. It is constructed in the following manner:

The box for containing ice and fish is 2½ feet wide, 5 feet long and 10 inches deep inside, and is lined with sheet zinc, held in place, with a one inch dead air space between it and the sides of the case. The bottom of the lining is sloped to a trap drain installed in the lowest corner, which will carry off all water from the melting ice, etc. The top of the case, which has a slope of 4 inches downwards towards the front in order to make the display of fish more easily seen, is made in two sashes 1¾ inches thick. These are hinged at the back and arranged to be held in a raised position when desired, by means of counter-weights in the back stiles. The sashes are fitted with two thicknesses of ordinary sheet glass, having a 1½ inch dead air space between the sheets.

While the specification that will be prepared will be for a case of a particular size, which is considered most convenient, obviously, any dealer desiring to have one made of another size to suit his own requirements, can readily do so. It is also the idea that this case may be used as a unit, and if further ones are needed they can be installed as required.

A sample case was built in the Department and tests made with the following results:

Seven inches of cracked ice and three fresh fish were placed in the case. The temperature of the room was raised to 74 degrees Fahrenheit, and maintained at that temperature. For a time the case cover was raised and closed at intervals. It was then kept closed for two hours, and at no time did the glass show signs of clouding. The temperature inside the case while it was closed, remained stationary at 38 degrees Fahrenheit. The sash was then raised and kept open for five minutes, and at the end of that time the thermometer, which was lying on the ice, registered 40 degrees. It was then suspended six inches above the ice, and the sash was kept open for five minutes longer, by which time the temperature had risen only to 48 degrees. The sash was then closed and watched for fifteen minutes, but no sign of clouding appeared.

The cost of the case, using the following existing high prices of articles here, is estimated at about \$40.00:

Lumber.....	\$60.00 M.
Zinc.....	.85 per lb.
Glass.....	.25 per sq. ft.
Labour.....	3.00 per day.
Small hardware, etc., ...	in proportion.

It is believed that with material at normal prices, the cost should not be more than \$30.00, and perhaps less in some localities.

Before completing detailed plan and specification, it is the desire of the Department to obtain the views of those interested and experienced in the fish business on this case, and it will welcome any criticisms or suggestions for improvement of it.

The Preservation of Sea Foods

Some Unique Methods Practised in other Lands.

By L. LODIAN.

All the varieties enumerated in Mr. Lodian's article can be purchased in New York.

Preservation by Semi-Petrification.

This is instanced in Japanese practice. It is a Niponese method of fish preservation. The exhibits are hard as fossils; and one would little suspect a juicy mackerel steak could be made out of those rock-like articles.

The method of preparation for preservation is simple. The bonito fish, — a sort of huge and plump espanol-mackerel, — is ripped into four longitudinal quarters, steamed, quickly air-dried without a particle of salt, — and the result is a product of stone-like density. It will keep for decades without deterioration, provided mite-life is kept from it: small grub-life will "go" for it as for anything else good.

Preservation in Wax.

The real kaviar of the Bosforos (Levant) is thus preserved, and is illustrated in diverse works on kaviar. Kaviar is an Arabic word; and the product, as preserved by slight salting and air-drying and preservation in beeswax in the region of Stambul and Izmir (Osmani), is beyond compare as regards contrast to the semi-putrid, blackish-greenish mass called "kaviar" which comes from OpeHrpad (pronounced Oreograd), south of the Ural range. The Russians among themselves do not call it "kaviar", but "ikra", which means roe. It is, at its best even inferior in savoryness and buccal-buke to the wax-preserved Turkish kaviar.

Sun-dried oysters.—What can be done by air-drying.

These delectable goods are from the Konfucius Asiatic Republic, where sun-drying, and preservation thereby, has prevailed for the past score milleniums. The Chinese even make their bar-sugar (with syrup, or invert-sugar, intact) by sol-desiccation of the sorgum-sap. There is quite an import of this cloyingly-sweet brown bar-sugar to America. A dried oyster-farina, of delicate flavor, is now creditably produced in China, and competes with the imported sun-dried oysters and the oyster-oil flavorant.

Preservation in Ink. — An Iberian Specialty.

This is the real sepia (ink) as used in more concentrated form by draftsmen, surveyors, mapping engineers, etc., for its black permanency; and is the only instance known of an edible food being preserved in ink.

The fish conserved is the cuttlefish, and it is pickled in its own ink: hence the inscription on the container — *kalamares en su tinta* (kalamars in their ink.) The contents are of a murky discoloration, but quite delectable; they are to the Iberian what lobster is to the American. The inky fluid itself is a juicy relish. The goods are much imported to America (via Manhattan), and sold among the bodega-espanola trade of lower Maiden-lane, Manhattan. So preserved, is the octopus cuttlefish itself with suckers intact: it is a difficult example of air-drying, yet proves the thoroughness with which the work can be done. There is a big import of these desiccated devil-fish; some are giants; and the eight suckers, if spread out, would encompass an ordinary room.

THE CONDITION OF THE FISH TRADE IN GERMANY.

Germany was in peace times a considerable consumer of fish says the "Fishing News". Of fresh sea fish, however, the public never had anything like the supply which Britain enjoys, in fact it must be reckoned one of the great advantages of our insular position that it has enabled fresh fish to reach the consumer at all times and everywhere in the country. In the years which preceded the war, considerable efforts were made to develop the great market which undoubtedly exists for fresh fish in inland Germany, but progress in this direction was slow, that is to say, slow relatively to the rapid progress which the Germans showed themselves capable of in other branches of industry. The fish which the ordinary German purchaser knew consisted for the most part of two kinds—cured and freshwater fish. Of the first, the cured herring was, of course, well to the fore. Freshwater fish are of much greater relative importance in Germany than they are in this country. The big German rivers produce a considerable quantity, and the slow-moving rivers like the Elbe and the Oder provide a large amount of eels. Besides this, Germany was very far advanced in scien-

tific pond-culture, and the production of fresh-water fish from this sources has shown what can be done in this direction with progressive and scientific fish cultivation. Under the conditions of to-day practically the whole German fish "catch" consists of eels and the artificially reared pond fish, both of which must have been of no small service to Germany in its fight against the British blockade. Fresh-water fish has increased in value, naturally, along with other food-stuffs in the country, but the statistics show that its rise in price has not been exorbitant, the different sorts having risen from 33 per cent. to 115 per cent. On the other hand, sea fish is considerably advanced as against 1913, the pre-war year. German statistics indicate that the price of whiting has advanced by 525 per cent., cod by 445 per cent., haddock by 190 per cent., plaice by 400 per cent., gurnards by 544 per cent., dogfish by 614 per cent., halibut by 180 per cent., turbot by 146 per cent., soles by 24 per cent., mackerel by 567 per cent.

In the interests of the consuming public the German Government has taken measures to keep down the price of fish. To what extent these are effective we have no information; but we may assume that they do serve their purpose in some fashion, as has been the

case with the measures affecting bread and meat. The procedure followed by the German Government has been to eliminate the competition of individual buyers. The Government interposes itself in all transactions between the seller and the wholesale buyer. No fish, either cured or fresh, can be imported into Germany except through the Central Purchasing Department in Berlin. This is the establishment—which must be a place of enormous dimensions by this time which deals in all the chief food products of the German people. If it does not actually handle the food-stuffs themselves, it controls their prices in every part of the Empire. The fish markets of the country are under the control of the Central Purchasing Department, and with a view to regulating the fish supplies it has ordered that all fresh fish must be consigned to the fish markets of Altona, Hamburg, Berlin, Geestemunde, or Bremerhaven. At these markets the fish are sold at fixed prices, the market authorities deducting 7 per cent. commission and the charges for freight, ice, and labour. The scale of prices at the Berlin market is given as follows by a correspondent of the "Scotsman": "At Berlin market," he says, "haddocks are sold at from 6d to 1s a pound, according to size; whiting at 6d; cod, 7d to 10d; plaice, 7d to 1s 2d; soles, 1s to 2s 6d; halibut, 8d to 1s 6d; turbot, 1s to 2s; mackerel, 9d; river salmon, 4s; large eels, 3s; carp, 1s; perch, 7d; bream, 7d to 9d." These prices, which are wholesale, do not seem to be excessive in the light of all we hear about the shortage of food in Germany.

SEATTLE SALMON MARKET.

Salmon—The salmon market is still firm with a steady upward tendency. Due to the holiday season, fresh inquiries have naturally been light during the past week. Prices continue to bulge. In fact, there is no market. It is entirely a question of packers getting about what they ask. Some ask more than others. Then there are some packs that generally command a little extra premium and then it depends, too, on whether the packer is in a position to make deliveries as wanted. A matter now stand, nobody wants to sell, for it is almost the unanimous opinion that prices on the little fish still unsold will remain at the present high mark or go higher before new fish are available, six or seven months hence.

Packers and brokers here are much interested in the peace talk, for there are possibilities involved in the coming of peace that may have a direct bearing on the canned salmon market. Canned salmon has been just as much a war material as munitions, and it has been the tremendous English demand that kept prices up and cleaned up stock. Now the question arises, will Europe want canned salmon after the war is over? Most packers and brokers believe that as a matter of fact the demand for salmon in Europe after the war will be greater than it has been during the war. By this they mean that a cheap food product will be one of the first things wanted after the war, and that not only the allies, but the Germans, will call for canned salmon. Furthermore, much is made of the fact that the British Government has been exploiting canned salmon for the past years, creating a demand, it is hoped, that could not have been created in any other way, at least without great expense.

The Griffith Durney Company, in its annual review of the market, after commenting on the fact the Alaska pack this year is the largest on record, goes on to say that even at the present high prices canned salmon is one of the cheapest of canned foods on the market, and that it is no doubt due to this fact that the record-breaking pack has been so speedily marketed. In commenting on the future of the market, this company says: "It is, of course, too soon to say anything regarding next year's pack, but it is timely to call jobbers' attention to the demand they will have for canned salmon between now and next fall. Remember, no new pack salmon can be shipped before the month of July, and then only in limited quantities. With the light carry-over here and the small stocks jobbers and retailers are carrying, what is causing us more concern than anything else is where jobbers will be able to secure salmon to supply the demand until the new pack is ready.

"Therefore, while present prices may look high, our firm belief is that to-day's quotations will look cheap 60 days hence. It is freely predicted that Alaska reds will reach \$2 and pinks will be hard to obtain at \$1.25. Hence we cannot resist urging the trade to examine their stocks of salmon and buy immediately all they will require for the next six months."

Still further evidence of the growing importance of the Siberian salmon fisheries is found in the visit to Seattle this week of Johannes Sagen, representative of the A. G. Denbigh salmon canning interests. Mr. Sagen states that his company has sold all of its last season's pack to the Russian Government and that the prospects are very bright for a brisk demand for canned salmon during 1917. His company is accordingly getting ready to establish some new canneries and enlarge its old ones. Mr. Sagen is buying supplies here in Seattle. Mr. Sagen will leave here for New York in a few days, thence going to Norway and on to Petrograd, and thence to Vladivostok, where his company has its Pacific Coast headquarters.

E. A. Sims, pioneer Puget Sound salmon canner, is going to South America. He states that if he likes the country he may locate there permanently. Mr. Sims has his eye on Argentina particularly. Mr. Sims now has a deal on for the sale of his controlling interest in the Soonah Packing Company. It is also said that the deal involves the sale of his other cannery interests. For years Mr. Sims has been a leader in the salmon canning business. He has been president of the Cannery Association and for years has been a member and a leader in the Washington State Legislature. Much of the fisheries legislation on the Washington statutes has been largely shaped by him.—The Canning Trade.

FISH DAY IN CANADA HAVING BENEFICIAL AFTER EFFECTS.

R. Urquhart, president of the B. C. Wholesale Fish Dealers' Association, with offices at Gore Avenue wharf, Vancouver, B.C., says that the Fish Day on Oct. 31 (inaugurated by the Canadian Fisheries Association), was highly successful and that the effect of the publicity campaign engaged in is still being felt among the fishermen and dealers. He thinks, however, that the dealers should advertise more frequently and the matter is being taken up with the membership.—Pacific Fisherman.

U. S. Fish Bureau Boosting the Grayfish, Reduced the Cost of Living

"It knocks H. out of the H. C. of L." — with this unconventional, not to say shocking, phrase, the Bureau of Fisheries of the Department of Commerce presents the grayfish, more commonly known as "dogfish", to the public as one weapon with which to make a dent in the high cost of living. The statement, worded in the main in everyday language, calls the attention of Mr. and Mrs. Housekeeper to the economic advantages of fish in general and grayfish in particular and gives receipts from grayfish hashh to grayfish show suey.

"The man who first spoke of the 'fickle public,'" says the Bureau, "may have been a milliner, a theatrical manager, a baseball star, or a politician; but it is certain that he has not in the fish business, for in few things is the public so steadfast and conservative as in the fish it eats. This is particularly the case with the American, who, blessed beyond most peoples with a great variety of excellent food fishes, eats but few of them. He, or possibly in this case it is she, talks fluently and often of the high cost of living, but takes no practical steps to reduce it, even when to do so requires no more initiative than the substitution of one word for another when the order is placed with the marketman. This is especially true of sea foods, of which today we are wasting by neglect more than we are using, largely because we do not even know the names of them and do not know what to ask for when we wish something at a low price better than some of the high priced things which we have been eating.

Fish Must Have a Reputation.

"Quality and price fix the economic character of a fish, but not until it has a name can it have a reputation, and without a reputation, and a good one, the public will not eat it, however excellent it may be. Fortunately for the fish, but unfortunately for the public, the early reputation of the grayfish was based not on its high quality as a food, but on its destructive habits. It is a pirate and a marauder, like the bluefish but its weapons are more efficient and it not only eats and drives away food fishes, but it cuts to pieces with its teeth the fisherman's gear and leaves him helpless and exasperated. Naturally under such conditions no name was too bad to apply to it, and the mildest one in common use is 'dogfish.'

How the Grayfish Operates.

"Adult grayfish weigh from five to fifteen pounds, seven pounds being a common weight. They feed on fish, crabs, shrimps and even lobsters. In this exclusive animal diet they are like bluefish, cod, haddock, and most other of our important food fishes, but are so ravenous in getting their food that they frequently make themselves nuisances by robbing the fishermen's nets and trawl lines. Trawl lines are long, stout lines to which shorter ones each with a hook, are attached at intervals of about six feet. They are stretched on the bottom of the sea, held in place by suitable anchors, and marked by buoys, and as a single dory, or fishing boat will fish several thousand hooks, each baited with a piece of herring, alewife, or other fish, with ten or twelve dories to the schooner, the fishing banks are thus strewn with food which the grayfish find acceptable and readily obtainable.

Has Been Worthless in the Past.

"When schools of grayfish appear they greedily

seize these baits and either carry them away or they are themselves hooked, the result to the fishermen being essentially the same in either case, for the line set for other fish is either denuded of its lures or is loaded with grayfish, for which the fisherman until now has had no market. The address and rapacity of these fish are such that when they are on the banks or along shore in large bodies they seize the baits before other fish can take them, and the fisherman in the past has lost his time, to labor expended in setting and hauling his lines, the value of his bait, and all the other items which enter into the expenses of the fishery."

According to the statement, grayfish are to be found on both shores of the North Atlantic. They travel in large schools, appearing suddenly on the coasts, remaining for a time and then disappearing just as suddenly. They take possession of a fishing ground, eating or driving away every other fish not too big to be swallowed or driven.

Valuable for Several Things.

"The grayfish," continues the circular, "is a trim, clean, clipper-built fish, swift in the water, as is required by its practical habits. Its skin looks scaleless, but when touched is found to be as rough as emery cloth, owing to close-sharp little particles encrusting it. The hide is sometimes used for polishing fine metal, ivory and wooden articles, and, as a more important possibility, gives promise of producing a leather suitable for the production of small novelties. The liver is valuable for its oil, which is in demand in the arts, particularly for dressing leather, and is said to have medicinal qualities not inferior to those obtained from the cod. The eggs which are hatched within the body of the mother, are as large as the yolks of hen's eggs, and a market has been found for them, also, in the leather trade. All of these uses are important in themselves, but particularly because the utilizations of these by-products makes it possible to can the fish as food at an attractively low price.

Good Eating Fresh or Preserved.

"Grayfish is excellent eaten fresh, and a market for it in that state has been developed by the Bureau in New York city, in connection with the tile-fish fishery; but it is as a preserved product that it will find its largest use. It can be prepared in a number of ways: Salted and dried like cod, smoked and canned in a variety of styles. The smoked fish is excelled by few, if any, products of similar nature, and it is probable that it will be available to the consumer during 1917.

"At present the fish is obtainable canned plain like salmon, and a can containing fourteen ounces of solid meat is purchasable for about ten cents, making it one of the lowest-priced fishery products on the market. It must not be inferred from this, however, that it is a low-grade commodity, for it is rich, wholesome, and generally excellent, and the variety of ways in which it may be served will make it an important addition to the country's diet. It has been used as a fresh food on the shores of the Mediterranean from times immemorial, and of late is has come into consumption in the countries of northern Europe. The officials of the Bureau of Fisheries have been testing it for years, and some of them are now using it in their own households. They are now giving the opportunity to others." — Gloucester Times.



Atlantic Dry and Pickled Fish Export Trade During 1916

By A. HANDFIELD WHITMAN, of Robin, Jones & Whitman, Ltd.

Writing in the Halifax Chronicle, Mr. Whitman says: The year 1916 has proved a prosperous one for those engaged in the Export Dry and Pickled Fish trade. During both 1915 and 1916 practically all of the Norwegian catch of Codfish was bought by the warring nations. In 1915 the bulk of it went to Germany. This year, after Germany had enough, about one-third of the catch, the British Government secured the balance, part going to France, and part resold in England, and practically all used for the European markets.

The diverting of this large Norwegian catch from the markets of Havana and South Brazil resulted in the necessity of these markets drawing their entire supplies from Canada and the United States. Hence the prosperous condition of the Export fish trade since the war broke out. The demand has exceeded the supply of suitable grades and also the facilities for drying and packing of the few export houses now remaining in the fish trade.

Catch of Shore Fish.

The catch of shore fish for 1916, as dried for export, was about one-third less than 1915. As a matter of fact the quantity of shore fish that is dried is steadily decreasing from year to year. This, however, is not the result of less fish being caught, but from year to year a larger percentage of the catch is being used fresh or for the cut fish trade, giving fully 25 per cent. more profit to the fishermen. Gloucester buyers cover the entire Atlantic coast line of Nova Scotia, and during the last two years have invaded the North Shore of New Brunswick and the coast of Gaspé. It is estimated that during the Summer of 1916, 5,000,000 pounds of salt bulk codfish were bought on the Gaspé coast by Gloucester houses, the best of it used in Gloucester for the cut fish trade and the inferior dried in Gloucester and dumped into Porto Rico to compete with the Nova Scotia product.

Lunenburg Bankers' Harvest.

The Lunenburg Bank fleet has had one of the most prosperous years in its history. In addition to a good average catch of fish sold at record prices a large portion of the fleet has earned large profits during the off season by freighting. The average profit made by the vessels in 1916 would probably be 50 per cent. The total catch amounted to about 175,000 quintals of an approximate value of \$1,250,000. The value of the vessels and outfit engaged in this fishery, and almost entirely owned in Lunenburg County, amounts to over \$1,000,000.

The shortage in the supply of dry shore fish was offset by the increase in the Lunenburg catch. The markets, which were supplied by Norway, call for

medium and large fish. Unfortunately, this year the Lunenburg catch had a larger proportion of small fish than usual, caused by a number of the vessels getting discouraged on the Grand Banks and finishing their voyage in the Gulf of St. Lawrence, where small fish prevail. The vessels that stuck to the Grand Banks were rewarded by finally getting good catches, Grand Bank fish are mostly medium and large. Before the war changed the conditions of the export trade, all sizes of Lunenburg fish were of practically the same value, but to-day there is easily a difference in value of from 75c. to \$1.00 per quintal between fish under and over 18 inches in length. As the exporters have bought the cargoes on a talqual price, Grand Bank trips have naturally had the preference.

Demand Was Excellent.

The demand for dry fish in all the consuming markets has been excellent throughout the year. The producer has had record prices — last sales of Grand Bank fish being at \$8 per quintal delivered Lunenburg—and exporters have had good margins of profit. The Porto Rico market is at present in bad shape owing to excessive consignments from Gloucester and Nova Scotia. This market is used as a dumping ground for fish not suitable for order business or not wanted elsewhere and it is feared that the Nova Scotia and Gloucester exporters' anxiety to get rid of their small and inferior codfish will keep the Porto Rico market glutted throughout the Winter. The high prices have very much curtailed the demand in both North and South Brazil, but as stocks suitable for these markets are in short supply, it is thought that everything will be absorbed at high prices.

Pickled Fish Business.

The pickled fish business has also received a big impetus on account of the war, which resulted in the curtailment of the European fisheries. Prices of all pickled fish rule about 50 per cent. above normal. Unfortunately, the catch of all grades was the shortest ever known. The result to the fishermen was very disappointing. The exporter, however, has had rather more profit on the smaller quantity handled than is usual on a bigger turnover.

The outlook for 1917 is most encouraging. Every shipyard is booked full of orders for new vessels, many of them for the Lunenburg Bank fishery. While the war has certainly resulted in increased prosperity for the fisheries, at the same time it is not thought that its cessation would in any way interfere with the plans for vigorously carrying on all fishing operations during 1917.

Fresh or Preserved ?

A Recent Court Case in Great Britain Regarding the Status of Frozen Canadian Fish.

In the King's Bench Division, London, Eng., recently, Mr. Justice Lush and Mr. Justice Bailhache, after listening for a day to arguments, delivered a reserved judgment in the case of the Midland Railway Company v. Wm. Warner's Sons & Co. At any time this would have been an interesting case, but at the present time, when there is likely to be, comparatively, a scarcity of food, and developments in new directions have been so strongly advocated, it is of great importance. The point at issue was whether frozen fish is fresh fish or preserved fish for the purposes of railway rates.

Those who are interested in the question may remember that the fish about which the bother arose was frozen salmon caught in Alaska and British Columbia. The County Court Judge—we forget who he was—decided that this fish was not fresh within the meaning of the Act. In the course of the appeal Mr. Talbot, K.C., who appeared for the railway company, submitted that the fish was fresh, and not preserved. He said:

The word preserved applied only to articles such as sardines, or anchovy paste, which had been treated in such a way that they could be eaten at once without anything being done to them; here the article required cooking just as any other fish sold as fresh would do. The railway companies carried large quantities of frozen meat, and that was always classified as fresh meat; and the fish in this case was in an analogous position. The word "fresh" when applied to fish was contrasted with "salted"; freezing was said to keep fish "fresh." If this judgment was correct, then any fish which a fishmonger had kept on ice in his shop was "preserved" and not fresh fish; and fruit which had been chilled and was eventually eaten in its natural state would have to be classed as "preserves," though preserved fruit or jam was a perfectly well-known article. He submitted that the word "preserved" was only applicable where there had been some process which altered the original nature of the article.

The question of what is and is not preserved has more than once been before the Confectionery and Preserved Food Trade Board, which fixes the minimum wages for "manufacturers" of preserved fish. Thus it has been contended that to be preserved an article must be submitted to some process whereby it is subjected to heat or something, and then put in airtight receptacles. For example, potted meat which is put into a glass jar and covered with a layer of fatty substance, butter or margarine or lard, is not preserved, but bloater paste in a tin is. Messrs. Warners' counsel, Mr. Hinde, argued that the County Court Judge had decided the point on a question of fact, and that his decision, therefore, could not be disturbed.

Mr. Justice Lush said that the appellants contended that the salmon should be paid for as falling within Class IV., or, alternatively, that it did not fall into any of the classes set out in the schedule to the Act, and so must be charged as within Class III.; while the respondents contended that it could only be charged for as within Class II.

His Lordship then dealt with the provisions of

the schedule, and pointed out that in fixing rates the Legislature had in mind, inter alia, the market value of the article and the comparative ease or difficulty with which it could be handled. The fish in this case was packed in special boxes, and was easy to handle without requiring any special care; and its value was not as great as fish of the same kind which had recently been caught. The evidence was that an honest tradesman would not sell it at a price as high as that of freshly-caught fish.

In his Lordship's opinion it was impossible to describe frozen fish of this kind as fresh fish. The description of fresh fish in Class IV. pointed to fish which would have to be promptly sold if it was not to become worthless. The care necessary in dealing with such fish would be greater than that required with the fish in this case, so both on the construction of the Act and on applying one's own sense to the matter it seemed to him that the first contention of the appellants could not be supported.

Their alternative suggestion, that this fish did not come within any of the specified classes, and so must be charged for as in Class III., depended on the contention that freezing was not a preserving process; but he could not see why freezing should not be held to be just as much a preserving process as salting or drying. The word "preserving" covered, in his opinion, every method by which an article was kept from putrefaction, and one such method was that of freezing. The County Court Judge was therefore right in his decision, and the appeal must be dismissed.

The House of Lords is to be asked to decide the point at issue. We do not know whether Messrs. Warner & Co. are bearing alone the burden of this litigation, but they deserve support from others interested in the trade, for the question is of the greatest importance in view of possible developments in the future. Here, for instance, is a question asked in the House of Commons this week, with Mr. Runciman's answer:

Major Chapple asked the President of the Board of Trade whether he had directed attention to the possibilities of increasing our Army and civilian food supply by getting frozen fish via the Panama Canal from British Columbia?

The President of the Board of Trade: The question of obtaining frozen fish from British Columbia and other places is receiving attention.

The railway companies at present have a giant's strength, and on principle they should be fought whenever possible. There is no doubt that one outcome of the war will be revision of the railways' position, and any precedent formed now is of the greatest importance not only to those who handle frozen goods in this country, but also to those overseas who are seeking to build up a trade in this country in such food.—Fish Trades Gazette.

Overseas Fish Export

The following is from the St. Johns, Nfld., "Star," apropos of the recent visit there of the Canadian Director of Fish Supplies. Major Hugh Green, whose services Premier Borden has placed at the disposal of the Government of Newfoundland to aid in the introduction of our fish in new markets, especially in the British Isles, has only recently returned from a ten months' trip throughout Europe and the British Isles, where he was engaged in the work of boosting Canada's fish products as articles of food.

As a result of his efforts and organizing ability, Ottawa reports, upwards of two and a half million pounds of Canadian fresh fish have been sent to the Canadian troops in England, who are now receiving fresh fish once a week, and smoked fish twice a week for breakfast.

In addition the War Office has undertaken to take large quantities, and the first consignment of a million and a half pounds is now being dispatched, representing an average value of 8 cents per pound to the Canadian industry.

If Canada can produce it, and he has no doubt that she can, Major Green declares that Great Britain can take up to five million pounds of fresh fish per week, while arrangement are being made to secure for the allies canned fish of various sorts. Ten million cans per week can be placed if available.

Major Green is at present representing the British Board of Trade in organizing the sending of the quantities required.

In addition to the demand for fish for ration, the War Office is negotiating for the securing of the finer specimens of Canadian fish such as halibut and salmon for the hospitals and convalescent homes.

"Once the Canadian fish business has been thoroughly organized to produce to capacity," said Major Green, "the War Office orders alone, not making allowance for public demand, will mean a million dollars a week to Canada. And even if the war was to stop tomorrow, Canadian frozen fish is on the map of England to stay henceforth and for evermore.

"We are laying the fish down at prices from 100 to 150 per cent. lower than it could be purchased in England for before. The saving to the British people as a substitute for beef will be enormous."

Prior to his departure for Canada, Major Green received a communication from Sir Thomas R. Robinson, representing the Australian Government. In this letter, Sir Thomas says: "Will communicate with both the Australian and New Zealand military authorities and inform them of your offer with reference to supplies of Canadian fish and I feel satisfied that they will be glad to take advantage of your suggestion. It may interest you to know that I was so pleased with the Canadian halibut that I managed to secure three other fish, one of which I am sending to the Lord Mayor, one to the Rt. Hon. Lewis Harcourt, and another to Rt. Hon. Wallace Runciman."

It is evident that a man of the ability and experience of Major Green will be able to do invaluable work in the same connection for this country, especially if, as is understood will be the case, the Canadian and Newfoundland Governments co-operate in the matter of opening up and supplying the prospective new mar-

kets. There is a great opportunity now available for the placing of our fishery products on the regular British bill of fare and the Australian field also appears to promise well in the development. Such an enterprise as this, then, offers almost unlimited possibilities and should result not only in the enhancement of fish values but also in a greater, more modern, development of our fishing industry and the manner in which it is prosecuted.

A Patent Trawl Setter

A revolution in the method of setting trawls will be caused by the patent recently taken out by Mr. Louis Potier, of Yarmouth, N. S. Mr. Potier obtained his patent from the Canadian Patent Office on the 21st day of November last, and has already made application for a similar patent in the United States. There are three principal features to the patent, which can be used in connection with any trawl tub or box ordinarily in use by fishermen.

First.—The principle whereby the trawl can be set and automatically paid out from a dory, boat or power-boat, without the hooks catching. Under ordinary circumstances, one man has to tend the trawl, passing it overboard by hand. With Mr. Potier's invention installed in the tub one man alone can set his trawl. He merely has to throw over the anchor on the end of the trawl line and then row or sail in the direction he wishes the trawl set, the trawl paying out from the tub automatically.

Secondly.—The tub is so arranged that the baited hooks are kept separate from the trawl-line itself, thus keeping it clean, as well as keeping the hooks and gangings from becoming entangled with the line.

Thirdly.—Provision is made whereby ice can be placed in the tub or box separate from the line and gangings, thereby preserving the bait. Fishermen will appreciate this feature, especially when using fresh bait. They will be enabled to bait their hooks in port, and if unable to get on the grounds at once, the bait will be kept in perfect condition; whereas at present, if the trawls cannot be set after they are baited, the bait spoils and the trawl has to be stripped and rebaited, a process which no fisherman enjoys, to say nothing of loss of time and bait. In this matter alone, Mr. Potier's patent will revolutionize trawl fishing.

Fishermen and experts, who have examined the model, are enthusiastic over it, and feel certain that it will prove a success, while those who have tried it out are already asking Mr. Potier to provide them with additional tubs fitted with his patent.

Mr. Potier informed the "Times" that he has been offered \$25,000 for the use of the patent in Canada and the United States. The offer comes from Yarmouth and New York parties, but the sale has not yet been completed.—Yarmouth Times.

NEW B. C. CANNERY INCORPORATIONS.

Kimsquit Fisheries, Ltd., of Vancouver, B.C., have been incorporated in the Province of British Columbia, with a capital stock of \$24,000.

British Columbia and Labrador Fisheries, Ltd., of Victoria, have been incorporated in the Province of British Columbia, with a capital stock of \$25,000.

A CALL TO EMPLOYERS

OCCUPATIONS FOR CRIPPLED SOLDIERS.

By SIR EDMUND WALKER,

President of the Canadian Bank of Commerce.

The end of the war is not in sight, but the wounded and otherwise disabled soldiers are coming back, and it is not too early to come to close grips with the problem of finding employment for those who have no claims on previous employers, and of caring for those who are partly or completely disabled.

We have to consider what we owe to the man who has fought to defend our lives, our property and our liberty, and we have to consider how to prevent the disorganization of industrial society when the soldiers come back in large numbers and the making of army supplies has come to an end.

We do not wish the soldiers' home-coming to mean, except perhaps temporarily, a cause of industrial disturbance. We want, on the contrary, to find in it a great opportunity to increase the prosperity and happiness of that part of the Empire which they have fought to save.

We shall have lost forever the labouring power of our heroic dead and of those few who are totally disabled. We shall have gained the labour of many women untried before the war; we shall have gained the added strength, physical and mental, of countless soldiers who through the war have "found" themselves; and we shall, in much fewer cases, have returned soldiers who are more or less wrecked physically or mentally but who are not quite useless to the community.

I presume much of the work to be done by the Military Hospitals Commission leads directly to the larger work of land and industrial settlement. For obvious reasons we shall hope that many of the returned soldiers will take up land. **The manner of selecting such land so that communities of loyal men shall be planted in every province, of caring for the soldier-farmer in his early years of settlement, and of lending him money for improvements, is of prime importance.**

Meantime the Hospitals Commission has added to its other burdens, the duty of making suitable for work, by training and by the use of newly invented "implementa", men who would otherwise in many cases be a charge upon the country and a monument of our ingratitude.

In my younger days the one-legged and one-armed soldier was always present, eloquent of war, and not without a meaning to the community,—"lest we forget." We were used to seeing a bank-messenger with one sleeve pinned to his breast and his handsome commissionaire coat covered with medals.

HANDICAPPED, BUT NOT DISABLED.

To-day, every employer of labour, manufacturer, merchant, banker, or whatever his calling, should be considering how he can employ a few partly disabled men, and thus do something more in carrying the burdens of the war.

Many a machine shop can use a certain number of one-armed and one-legged men with hardly any loss of efficiency. The Hospitals Commission sends them

out better prepared to lessen the effect of their disabilities than the wounded soldiers of other wars.

In a recent campaign to raise money for the British Red Cross, two officers totally blind from the effect of wounds appeared before the public. Both had been trained in the wonderful establishment in England administered by Sir Arthur Pearson. One of these blind officers is now employed as an expert electrician, while the other is a competent actuary and already engaged in soliciting life insurance.

Totally blind men are being trained as stenographers, taking short-hand notes by a system which enables them to read by touch before being typewritten by the same blind operator. Some of these men are already much more efficient than the average stenographer.

What the peaceful communities at home must bear in mind is that these men are not rendered unfit for useful work but that they are handicapped or forced by the loss of one limb or sense to put more energy into their remaining abilities.

All the ingenuity of this ingenious age should be employed, no matter at what cost, to enable the wounded soldier to earn his own living, — which will not affect any pension he may receive.

When everything that human skill and sympathy can do is done, we shall still have some men to be entirely taken care of by the state. I hope that in creating Soldiers' Homes for these, as well as in finding good work for all not totally disabled, we shall completely revolutionize the past and make the name of Canada shine brightly for its wisdom and its humanity in caring for its crippled heroes.

[Many disabled soldiers might be employed by firms in the fishing industry. Such men could work around the fish flakes; on the docks, in the smoke-houses, and labelling and packing cans in canneries. There are doubtless many other positions in the industry which could be filled by returned soldiers who have been permanently injured in fighting the Empire battles. We owe these men a great debt, and it behooves us all to do our best to give them a hand and make places for them. — [Editor, C. F.]

HALIBUT SHORTAGE.

A shortage of 20,000,000 pounds of halibut, the result of strikes, etc., will affect seriously the price of other fish. Last season halibut sold for 9½@10 cents per pound. It has been bringing 18@20 cents this winter, with no relief in sight. It will never sell at very low prices again. The demand is too great for this popular fish at 25 cents per pound retail. It is the cheapest fish obtainable, and one of the most palatable.—Fishing Gazette.

Steam Trawlers in Peace and War

One of the notable instances of backwardness in connection with the marine industry of this country is to be found in the extraordinary small number of steam trawlers owned by American firms, says *Shipping Illustrated*, New York. It was not until 1905 that the Bay State Fishing Co., of Boston, placed an order with the Fore River shipyards, at Quincy, Mass., for a vessel of this type, which was named the "Spray." This vessel was the first steam trawler under the American flag and her general outline followed the arrangements adopted in the construction of her British prototypes, except that, as usual with American vessels the accommodations were vastly superior and in other respects many niceties of equipment details were introduced. The financial success of this boat should have led to the construction of many more, but owing to the threat of prohibitory legislation, no more trawlers were built in this country until 1910. Since then a few more have been added to the fleet of the Bay State Fishing Co., which up to recently owned a fleet of nine vessels, all more or less similar to the "Spray," which measures 126.6 x 22 x 12.9 ft., and is driven by triple-expansion engines having cylinders 12-4 x 22 x 36 in. with 24 in. stroke. Lately, the Bay State Fishing Co. decided to add to its fleet, but owing to the crowded state of Atlantic coast shipyards, the order went to a Great Lakes firm, the Manitowoc Shipbuilding and Dry Dock Co. of Manitowoc, Wis. One of these trawlers, the "Comber," has a speed of 10 knots, measures about 300 tons gross register and has dimensions 135 x 22.6 x 14.3 ft., with 24-in. stroke, steam being supplied by one Scotch boiler tested for 180 lbs. working pressure and measuring 12.6 x 10.3 3-4 ft. Considering the large number of steam trawlers in use in Great Britain, France, Holland and Germany, it is more than remarkable that there should be so few of these vessels in operation on this coast, but as stated above it was the threat of prohibitory legislation induced by unprogressive fishermen jealous of the success of the Bay State Fishing Co. which deterred others from embarking into the steam trawling industry. The campaign against the trawlers was predicted upon the allegation that they scared the fish away and denuded the fishing grounds of their denizens. Whatever truth there may be in this allegation, the campaign against the trawlers has been the means of depriving the country of a class of vessels that could be most useful in case of war for mine-sweeping purposes. The mine-sweeping work performed by the steam trawlers in the service of the British Admiralty is too well known to our readers to be gone into at present. But it must not be overlooked that it is thanks to the trawlers and the hardy class of seamen brought up in them that it has been possible for mercantile shipping to escape annihilation in the waters that the Germans had sought to make impassable by strewing them with floating mines, a form of warfare as brutal as it is unwarranted by the laws of civilization. In a report on the necessities of the national defense, prepared last year by

the Navy Department, it was stated that in case of war several hundred steam trawlers would be required along our coasts for mine-sweeping purposes. Of course, this deficiency could be remedied by the employment of deep sea tugs, but this fact alone should serve as an inducement for the building of more trawlers, because their owners would have the assurance that in case of war their vessels would be taken over and paid for by the Government. There being so little known here concerning the history of steam trawling, a retrospective glance may not be amiss. Steam was first applied to trawling at Hull about the year 1877, when a wooden vessel was fitted with a rather small propeller. This venture proved a failure. Fishermen generally believed that it would be impossible to fit a propeller so that it would not foul the trawl. But first one and then another tried to apply steam, to deep-sea fishing, and along the Northeast Coast of England many paddle tugs had fishing gear placed on board. These vessels would leave the Tyne, the Tees, or the Wear, in the afternoon and return the following morning with live fish. One of these vessels was eventually caught in a gale. Her trawl warp cut through her side and she foundered with serious loss of life. Tub-boats were then abandoned, and gradually steam trawlers, as we know them, were introduced. It was long before practical fishermen could be persuaded that steamers could be successful as trawlers, and the first steamers introduced at Hull and at Grimsby were not catchers but merely carriers. The fishermen were glad to get their catches to market by means of these steamers, but when the winter season came round they demanded that these boats should be laid up and that "single boating" should be resumed. The owners declined to lay up the steamers and there was a strike of fishermen. Trawls were then put on board the steam carriers and they went to sea, picking up a good living, whilst the crews of the sailing vessels were earning nothing. This put an end to the strike and the men returned to work, since which time there have been but few disputes. Companies were formed at Hull and at Grimsby and the steam trawlers were multiplied enormously. These fine vessels have altogether superseded the sailing smacks at Hull and also been adopted in large numbers by French, Dutch and German fish companies. As regards the ownership of British steam fishing vessels, Hull heads the list, several hundred trawlers being owned at that port. Just as in the mercantile marine, the tendency has been towards larger and faster vessels, so the steam trawlers have increased in size and steaming power, and in normal times go long distances in search of fish. They used to go as far south as the coasts of Portugal and Morocco; amidst the Hebrides and the Orkneys; and away up the Skagerrack as far as the Seaw, while French vessels crossed the Atlantic to the Grand Banks. In 1911 an Aberdeen trawler, the "Coquet", came to New York, but was driven away by the tariff imposed on her catches. Since the war began, British trawlers have chiefly been employed in mine-sweeping, so that the Dutch fishermen have reaped fortunes. The

trawling industry has been the nursery of some of the bravest seamen that ever ploughed the deep. They have proved their worth in the dangerous work of mine sweeping, which is performed entirely by volunteers recruited from the steam trawl and drifter fleets. In mine-sweeping two trawlers work together at some distance apart — about 300 to 400 yards. They are connected by a steel-wire hawser, which trails in the water between them, and is kept by sinkers or other means at such a depth that the loop formed by the hawser will be below the mine when the trawlers are steaming ahead. The mooring wires of the mines are thus caught up by the hawser, the mines are swept up, and exploded at some distance from the sweeping vessels. It will be seen that in this plan any mine lying between the trawlers is captured, but there is nothing to prevent the trawler itself running down and so exploding a mine with the almost certain consequence that the trawler is destroyed, and probably most of the crew as well. Several suggestions have been made to protect the trawlers and even larger vessels by fitting a spur or net in front of the ship to catch the mine immediately ahead, but the mechanical difficulties in providing fittings to resist the force of the sea and waves are great, even in vessels of small size and low speed. Besides such devices have been tried, but without success. The mines which become floating mines by being broken from their moorings have to be caught by steam drifters working with nets. These also have to meet the risk referred to above, but they have to face the perhaps additional risks of mines being exploded in the net fairly close to the ship either through the mechanism catching in the net or by two mines being jolted together and both exploding. A mine exploded a few feet away from a ship will probably not destroy her, but when the explosion takes place almost close to her side the damage done is enormous, and such as to make it uncertain whether even the largest merchant ships could survive its effects. This has been proved by the recent foundering of the giant hospital ship "Britannic", which struck a mine in the Aegean Sea.

ALL FISH GOOD TO EAT.

All fish are good to eat, the varieties which are popularly supposed to be good eating depending entirely upon the locality. In the South, certain varieties of fish are eaten which would not be touched in the North and vice versa.

Fish is generally considered cheaper than meat, and if fresh and properly cooked, it is more easily digested and because it is less stimulating than red meat is better suited to the diet of an invalid. The rheumatic patient may eat fish when meats like beef, mutton and lamb will be denied him. It is also well suited to the diet of children.

In composition fish is very similar to meat, though containing less protein and fat, it has sufficient of both to satisfy the demands of the average individual.

There are two general classes of fish—the fat and the lean. Salmon and herring are good examples of the first, white and cod belong to the class of lean fish. Fat fish are better when broiled and served with an acid sauce—that is, a sauce highly flavored with lemon juice, vinegar or tomatoes, and seasoned with pepper or mustard.

Lean fish may be boiled, baked or steamed and served with a rich sauce, which will increase the deficient fat and also add to the flavor.

Because fish spoil easily they are always better flavored the shorter distance from the water in which they were caught to the table from which they are eaten. Not only should the transfer be short, but the time in which it is made should be brief. In other words, fish should be fresh when purchased and should be prepared for the table in as short a time as possible.

It is not difficult to distinguish fresh fish from one that has been too long out of the water. There are two ways to tell whether a fish is fresh or stale. First, if the eyes are bright and glassy it is fresh; if sunken, dull, discolored, it is stale. Second, if the finger be pressed on the fleshy part and it is solid and elastic the fish is fresh; if the pressure leaves a mark, it is stale. This applies to salt as well as fresh water fish.

Fish that is frozen should be cooked immediately after it is thawed. The flesh of frozen fish is never quite so firm as when freshly caught, nor is the flavor quite so agreeable.

Persons who like seafood and the very many excellent dishes which may be based upon it, will be interested in an article by W. I. DeNyse in the current issue of the Zoological Society Bulletin. The writer calls attention to the fact that many types of fish found in plenty in nearby waters, make very good food, but is seldom served as such.

"The sea raven," says the writer, "when skinned and the backbone removed, furnishes two pieces of flesh that either broiled or fried is excellent. The common sculpin makes a good stew and is also very good fried. The tail of the big angler (*Lophius piscatorius*), when broiled or boiled, is quite equal to the ordinary sea fishes as food.

"The skates, or rays, are edible and very much used for food in other countries. The flesh of the skate when boiled tastes much like lobster, and many so-called lobster salads may consist chiefly of skate meat with a little lobster meat added for the proper coloring."

The value of the dogfish as a palatable and nourishing food, described in previous articles in the Herald, is emphasized by Mr. Nyse, who says:

The dogfishes (*Mastelus canis* and *Squalus acanthias*), are good food fishes that will eventually be in demand.

"On the west coast of England they are utilized both fresh and salted. At Folkstone quantities of them are salted, then freshened and afterwards smoked, when they are called Folkstone beef.

"Our native dogfishes are now being eaten to a limited extent in Canada and New England.

"The writer has personally tried young drumfish, eel pouts, couger eels and even the despised toadfish, and found them palatable."—New York Herald.

There is still a chance for producers of herring in Maine, New Brunswick, Nova Scotia and Newfoundland to make a killing in New York and, incidentally, to make a small fortune by shipping right away a reasonably large supply of split and round herring. Present market prices are \$8 @ 8.50 for medium and large, respectively, which is enough of an inducement for any shipper.—Fishing Gazette.



GRAND MANAN FISHERIES

According to several parties of Grand Manan fishermen who arrived here recently to look after business interests, the lobster catch this year is only about half normal. The catch is said to be the smallest since the ten-inch law went into effect several years ago, and many place the cause of the great falling off in the important industry to changing the opening date of the season from January 5 to November 15.

Lobsters are said to come near the shore the latter part of the fall to shed their shells. Before they have a chance to fill out and get to deeper water they are caught in traps; besides this they bite each other and often, when caught while the shells are soft, are unfit for the market. The fishermen heartily believe that the change in the opening date of the season has worked no good, and a great deal of harm. Formerly the catches were fair in the fall, and then good in the spring, but since the enactment of the new law, the lobsters are caught when hungry and often while spawning. The catch is thus all made within a very short time and the grounds stripped of lobsters for the rest of the season.

At the present time the Grand Manan men are being paid forty cents apiece for pound and a half lobsters. Last year at the opening of the season the price was but twenty cents. There are now seven American smacks in the heart of the lobster centre, awaiting cargoes to carry to Boston and other points. Since the opening of the season only two have been able to sail after securing the average cargo of 5,000 lobsters. In previous years the smacks have been able to load and sail all within two or three days after the opening date.

It is claimed that many of the Canadian spawn lobsters are being pounded—placed in reserve pools in tide water—and in the spring 1,000 of the best product of the island will have multiplied into 7,000 or even 8,000 healthy specimens.

With the exception of the lobster and the herring catch, which has likewise been very small, the island fishermen have had the most prosperous year of their careers. Grand Bay and Woods Island side of the Seal Cove Sound have enjoyed unprecedented prosperity. One fisherman is said to have cleared \$10,000 for his catch of sardine herring; other weir owners took stock from their weirs that netted them from \$15,000 to \$18,000 for this season alone. This, however, was not in all parts of the island, but only on the east central side, where catches went to American factories, where as high as \$35 a hogshead was paid.

The fishermen say that the reason the Canadian markets have been short is accounted for by the fact that

most of the fish have been going into Boston, some 600 tons of herring having been shipped there already this year. A peculiar feature of the situation is that the Island, one of the best fishing grounds off the North American coast, is now importing dry pollock, believing they will catch some for their own use later, and then "later" never comes.—Telegraph, St. John, N. B.

EEL FISHING IN QUEBEC.

Eels are not in form pleasing to the eye, nor do their habits commend them to the taste. Nevertheless in Europe and America their flesh is in demand, and scientists tell us it has great food value. It may be news to many that eels are caught at certain points in Canada and shipped to the States, where the market for them is steady. The chief center in Canada for this industry is at Iberville, near St. John's, Quebec. The Thuot family at that point have a license from the government for laying traps, which extend in a zigzag line almost entirely across the Richelieu River, which at the point is about half a mile wide. Early every morning the traps are examined, and the catch removed and deposited in large vats which lie partly submerged near the shore. These vats are the storehouses from which the eels are taken as the market calls for them.

The Richelieu River, by reason of its muddy bottom and the softness of its water, is said to be particularly well adapted for the propagation of eels. Naturalists, however, tell us that they have not very much precise data as to the habits of this fish. But the fact is eels are caught in the Richelieu River up to a yard or more in length, with a girth equal to that of a man's arm. Four or five eel catchers are constantly employed, and the director of this unique enterprise is said to have acquired a moderate competence. Some say the net profits last year were not very far short of \$10,000. Shipments average about four barrels a day, and they go chiefly to Chicago.

GOOD WORK!

Bridgewater Bulletin:—"H. R. Silver, fish merchant of Halifax, addressed a meeting in the school room Riverport, Thursday evening on the improving method of curing fish."

[Education work of this nature by those in the trade is better than a dozen lectures by professional teachers. We commend Mr. Silver on his work and would suggest that others follow his plan.—Ed. C. F.]

LEATHER FROM SHARK SKINS.

The condition of the leather market makes desirable the utilization of all available supplies of suitable animal skins. The U. S. Bureau of Fisheries of the Department of Commerce has taken up the possible value of shark skins in making various kinds of leather. Such skins, as is well known, have for many years had a limited demand in the United States as coverings for minor articles of ornament and utility, but their use as leather has been very restricted. An acceptable leather has been prepared from shark skins in several foreign countries and there is no apparent reason why the skins of certain sharks caught on our own coasts or in foreign waters may not be converted into serviceable leather by American tanners.

Shark skins are very tough and durable, and some of them show a beautiful surface pattern which persists in the tanning process. Leather made from the skins of the larger sharks has very considerable body, and such sharks will be in greatest demand if experiments of the Bureau of Fisheries prove as successful as anticipated, although the skins of minor sharks and the grayfish also are being handled.

Arrangements have been made for securing from Florida fishermen a supply of very large shark skins; and further specimens are expected from other sources, especially from a number of lightships off the South Atlantic and Gulf coasts. The Bureau of Light-houses is co-operating in this matter and will authorize the men on southern lightships to catch sharks and preserve their skins.

The Bureau of Fisheries is supplying fishing tackle. The skins will be sent to tanners for treatment in various ways, and it is hoped that such raw material will prove so useful that fishermen on all parts of our coast may hereafter find a market for skins of all kinds of sharks now incidentally caught in line and net fishing.

The Bureau of Fisheries solicits correspondence with tanners, leather dealers, and manufacturers who may desire to co-operate with it in exploiting this waste product. (We, in Canada, might take a leaf from Brother Jonathan's book, and do likewise).

IMPORTS OF FISH INTO GREAT BRITAIN DURING OCTOBER, 1916.

The value of the fish imported in the month of October amounted to £920,683 (\$4,603,415), compared with \$3,660,070 last year and \$2,205,840 in 1914, showing an increase of \$943,345 against last year, and \$2,397,575 against 1914. The value of the fresh fish increased from \$603,805 to \$784,090; from Norway the value was only \$440, against \$10,300 last year. There was a marked decrease in the value of sardines, from \$845,420 in 1914 and \$371,515 last year to \$225,380; the value from France was \$26,310, against \$115,235 last year. The increase in the value of canned salmon was from \$1,458,915 to \$1,491,405, and it was entirely due to Canadian fish, the value from the United States showing a large decline. The canned lobsters were valued at \$284,695, against \$200,080 last year. The value of the "not canned fish, all sorts, was \$1,221,950, against \$430,555 last year, and \$207,695 in 1914; the value from Norway was \$1,440, against \$10,720, and from the Netherlands \$58,125, against \$440 in 1915.

LIVE FISH FOUND IN SHAFT 3,800 FEET DEEP.

A correspondent, writing to a recent issue of the "Fishing Gazette," describes the taking of live fish from the bottom of a Transvaal gold mine. "The fish," he states, "were found in the catchment at the 900 feet level, and also at the bottom of the shaft. The particular shaft from which they came is vertical and 3,800 feet deep. The fact that they were found alive at the bottom as well shows, I think, that they must have been merely spawn when they fell. The fish I have seen were barbel, very light in color, and from 6 inch to 112 inch long, and up to $\frac{3}{4}$ lb. in weight. They were not nearly as black as the river barbel we get here. What on earth they find at the bottom of a shaft in the way of food I cannot think. However, they apparently thrive.

"Frogs and water-snakes are much more common than fish. In exceptionally dry weather bull-frogs have been seen to distend themselves and deliberately jump down the shaft, apparently in search of water. This sounds, I know, rather like Louis de Rougemont, but it is a fact. How on earth they ever reach the bottom alive is more than I know."

The writer adds that it is quite impossible for any surface water (rain or steam) to enter the mouth of the shaft.

NORWAY'S COD FISHERIES.

Higher Prices Make the Industry Much More Profitable

The great Norwegian cod fishery, which extends along the coast from Finmarken to the vicinity of Bergen, and is most productive at the Lofoten Islands, has closed with a total catch of 51,397,000 fish according to the report of E. Haldeman Dennison, United States consul general at Christiania. This is 15,437,000 fish less than in 1915 and less than in any year since 1908. The greater part of the catch, 44,641,000 fish were salted and prepared as split fish 3,256,000 were dried as stock fish and most of the remainder were exported fresh. Although the catch was under the average, the great demand for fish, due to the war, made the value greater than in any previous year. The official estimate is \$20,100,000. In 1915 the estimated value was only \$9,461,000 and in 1914, \$8,584,500.

The value of the herring landed during the past season was about \$23,000,000 for the "green fish," and the value of the canned fish exported, chiefly sprats and small herring was about \$14,000,000.

These figures indicate the great profits that the Norwegian fishing industry has made, due to the high prices obtained because of the existing war in Europe.

It has been reported that the British government has purchased this year's entire Norwegian fish catch, and that the purchase includes also sardines and other canned fish.

In virtue of a resolution of the Storting export duties have been placed upon a large variety of fish and fishery products the amounts ranging from 26.8 cents per 100 kilos for split fish to \$1.34 per barrel for spiced herring. These duties came into force on March 30th and will continue until royal decree.

NEWFOUNDLAND MARKETS.

ST JOHN'S, December 30th.

There has been no change in the local price during the week, viz., Prime Merchantable Codfish, \$8.00 to \$8.30; Labrador (shore cured), \$7.70 to \$8, and Labrador (soft), \$6 to \$6.20. About twenty schr. loads arrived during the week, mostly large craft belonging to the merchants north and west.—There are about ten others to come from northern outports, the arrival of which will end fish freighting in schooners for the season. Of 1,210,000 qtls. caught during 1916 by Newfoundland fishermen we estimate that 700,000 have been already exported.

Codoil.

The demand for common cod oil holds good at \$178.50 to \$180 per tun in the city. Large shipments are being made to New York and Liverpool orders every available boat, and the total sent out from St. John's since August 1st amounts to about 2,800 tuns, as against 2,000 tuns at this date last year. Fully two-thirds of this went to New York. Refined oil is still torpid, and \$1.35 is the best offering we heard of this week. We have sent out about 300 tuns from St. John's since August 1st to the foreign markets.

Herring.

The herring fishery in Bay of Islands, Bonne Bay and Notre Dame Bay shows very little improvement on last week's results, so that the salt herring fishery, which under ordinary conditions has only a few weeks more to run, will be only about half that of last winter. Those who have been so fortunate as to get fair catches stand to make good money both with split and Scotch cure, the local prices of which are now respectively \$4.75 and \$10 for No. 1 pack. The New York prices are \$9 and \$16 respectively.—Trade Review.

CUBAN MARKET CONDITIONS.

The following report of prices ruling at the Havana Produce Exchange for the week ended December 15, 1916, has been furnished by Mr. Enrique R. Margarite, S en C., 16 San Ignacio street, Havana:—

Fish in Drums.

Importation—

- December 9, SS. Esparta, 352 drums.
- December 12, SS. San Mateo, 222 drums.
- December 13, SS. Havana, 60 drums.

The market for fish in drums has been active this week, with the same prices in evidence, cod selling at 10 haddock at 10½ and hake at 8½ cents per pound.

Codfish in Cases.

Importation—

- December 9, SS. Esparta, 1,100 cases from Boston.
- December 11, SS. M. Castle, 40 cases from New York.
- December 11, SS. Chalmette, 360 cases from New Orleans.
- December 12, SS. San Mateo, 1,930 cases from Boston.
- December 13, SS. Calamares, 1,144 cases from New York.

The demand for codfish in cases has been anything but active and, as the arrivals just alluded to are very heavy, the prices have fallen off. Norwegian cod is quoted at \$16 and that from other sources at \$11 to \$15 per case.

Herrings.

With a good demand prevailing, bloaters are being sold at \$1.50 per large box.

TRADE INQUIRIES.

Addresses can be obtained only by those especially interested in the respective commodities upon application to: "The Inquiries Branch, The Department of Trade and Commerce, Ottawa," or The Secretary of the Canadian Manufacturers' Association, Toronto, or The Secretary of the Board of Trade at London, Toronto, Hamilton, Kingston, Brandon, Halifax, Montreal, Quebec, St. John, Sherbrooke, Vancouver, Victoria, Winnipeg, Edmonton, Calgary, Saskatoon, Regina, Winnipeg Industrial Bureau, Chambre de Commerce de Montreal and Moncton, N.B.

Please Quote the Reference Number when requesting Addresses.

2065. **Fish.**—An old firm in Barbados, asks to be put in touch with Canadian exporters of fish in Halifax and St. John.

1996. ***Fish oils.**—A London firm of importers and brokers asks to be placed in touch with Canadian exporters of fish oils, from whom they invite offers.

199. **Canned salmon.**—One of the largest wholesale grocery and general merchandise companies in Australia doing an extensive distributing business, is desirous of entering into direct negotiations with British Columbia packers of various grades of canned salmon with a view of arranging in advance for the purchase of their 1917 requirements. This is an exceptional opportunity for Canadian packers, not already represented in Australia, to secure large business from a wealthy corporation particularly desirous of obtaining their supplies within the Empire.

2002. ***Cod and other fish oils.**—A number of inquiries have been received from merchants in the United Kingdom for cod and other fish oils from Canada.

N. S. SALMON EXPERIMENT.

The Department of Marine and Fisheries has made a successful experiment of considerable interest to scientists and to salmon fishermen. It has been contended for a long time by scientists that the same salmon do not ascend the Canadian rivers every year, but every second year. In November, 1914, a salmon was stripped of eggs at the Margaree Pond, Nova Scotia, tagged and released. The same fish returned a year later. On November 4th last year a salmon measuring 32in. was stripped at the St. John hatchery, tagged and released. This fish with the tag attached returned this fall and was stripped of 9,000 eggs. The fish had gained two inches in length and two pounds in weight.

LUNENBURGERS PREPARING FOR COMING SEASON.

It is likely that in the Banking voyage of next season the highest wages ever paid this class of fishermen will be offered. Already some of the captains are engaging men for the voyage and most of the men prefer to go for a stipulated sum and bonus per thousand fish caught, disliking the old custom of engaging for a share. This year the voyage will open earlier than ever before and some vessels should get away by the second or third week in January. Some owners of vessels are now buying up bait for the initial trip of the schooners to the Banks.

HALIBUT ARRIVALS AT PACIFIC COAST PORTS, NOV. 1 TO NOV. 30, INC.

AT PRINCE RUPERT B.C.:

- Nov. 1. Sitka, U.S., 60,000, Booth Fisheries Company.
- Nov. 3. Tyee, U.S., 80,000, The Canadian Fish & Cold Storage Co., Ltd.
- Nov. 7. Alten, U.S., 60,000, Atlin Fisheries Limited.
- Nov. 7. Polaris, U.S., 45,000, Booth Fisheries Company.
- Nov. 7. Alameda, U.S., 4,000, Booth Fisheries Company.
- Nov. 8. Geo. E. Foster, 20,000, The C. F. & C. S. Co. Ltd.
- Nov. 8. Jas. Carruthers, 14,000, The C. F. & C. S. Co., Ltd.
- Nov. 8. Seymour, U.S., 50,000, The C. F. & C. S. Co., Ltd.
- Nov. 8. Chief Skugaid, 10,000, The C. F. & C. S. Co., Ltd.
- Nov. 9. La Paloma, U.S., 4,000, National and Independent Fisheries.
- Nov. 10. Vesta, U.S., 15,000, Booth Fisheries Co.
- Nov. 10. J. P. Todd, Booth Fisheries Co.
- Nov. 10. Lincoln, U.S., 7,000, The C. F. & C. S. Co., Ltd.
- Nov. 10. Constitution, U.S., 16,000, The C. F. & C. S. Co., Ltd.
- Nov. 10. North Cape, U.S., 7,000, The C. F. & C. S. Co., Ltd.
- Nov. 10. Olympic, U.S., 8,000, The C. F. & C. S. Co., Ltd.
- Nov. 11. Omaney, U.S., 50,000, The C. F. & C. S. Co., Ltd.
- Nov. 14. Jennie, U.S., 5,000, The C. F. & C. S. Co., Ltd.
- Nov. 14. Agnes B., 6,000, The C. F. & C. S. Co., Ltd.
- Nov. 14. City of Seattle, U.S., 60,000, The C. F. & C. S. Co., Ltd.
- Nov. 14. Andrew Kelly, 65,000, The C. F. & C. S. Co., Ltd.
- Nov. 14. Eidsvold, U.S., 12,000, Booth Fisheries Co.
- Nov. 14. Alaska, U.S., 18,000, Booth Fisheries Co.
- Nov. 15. Senator, U.S., 22,000, Booth Fisheries Co.
- Nov. 15. Vansee, U.S., 60,000, The C. F. & C. S. Co., Ltd.
- Nov. 15. Republic, U.S., 60,000, The C. F. & C. S. Co., Ltd.
- Nov. 15. Orient, U.S., 45,000, The C. F. & C. S. Co., Ltd.
- Nov. 15. Arctic, U.S., 20,000, The C. F. & C. S. Co., Ltd.
- Nov. 15. Spit, 5,000, The C. F. & C. S. Co., Ltd.
- Nov. 17. Chief Zibassa, 15,000, The C. F. & C. S. Co., Ltd.
- Nov. 17. Helgeland, U.S., 20,000, The C. F. & C. S. Co., Ltd.
- Nov. 17. Margalice, 6,000, Atlin Fisheries Limited.
- Nov. 20. Director, U.S., 5,000, Atlin Fisheries Limited.
- Nov. 20. Liberty, U.S., 30,000, The C. F. & C. S. Co., Ltd.
- Nov. 20. Sumner, U.S., 20,000, Atlin Fisheries Limited.
- Nov. 22. Aurora, U.S., 8,000, Booth Fisheries Company.
- Nov. 22. Chief Skugaid, 5,000, The C. F. & C. S. Co., Ltd.

- Nov. 23. Venus, U.S., 16,000, Booth Fisheries Company.
- Nov. 24. Sitka, U.S., 35,000, The C. F. & C. S. Co., Ltd.
- Nov. 25. Pescawha, 35,000, Atlin Fisheries Limited.
- Nov. 28. Elfin, U.S., 5,000, National & Independent Fisheries.
- Nov. 28. Constance, U.S., 50,000, National & Independent Fisheries.
- Nov. 28. Jas. Carruthers, 15,000, The C. F. & C. S. Co., Ltd.
- Nov. 29. Grier Starrett, 5,000, The C. F. & C. S. Co., Ltd.
- Nov. 17. Tom & Al., 35,000, Ripley Fish Company.
- AT VANCOUVER, B.C.
- Nov. 11. Celestial Empire, 30,000, The Canadian Fishing Company, Ltd.
- Nov. 13. Flamingo, 40,000, The Canadian Fishing Company, Ltd.
- Nov. 15. Manhattan, 130,000, New England Fish Co.
- Nov. 17. Kodiak, 65,000, New England Fish Co.
- Nov. 18. Kingsway, 75,000, The Canadian Fishing Company, Ltd.

NEWFOUNDLAND HERRING PROSPECTS POOR.

The Newfoundland herring situation is very gloomy indeed says the Gloucester Times on January 3rd. and from all sources come most discouraging reports of the fishery this season. The catch to date is far below normal and there is nothing at present to indicate that there will be any improvement.

Several of the vessels which went to west coast early in the season are still there, some with part cargoes, while others have secured little or none. In years past, most of the fleet would have been home ere this and some of the crafts been back again on the scene, loaded or nearly loaded with frozen or salt cargoes.

Added to the discouragement of poor fishing conditions is that of no frost, something almost unusual at this time of the year. No drift ice has been seen as yet in the Gulf and winter has been open, with lots of wind and rainy weather, so that when there has been a sign of fish, the fishermen have been unable to do anything.

There is nothing at all at Bonne Bay, the fleet having left there last month and all are at Bay of Islands now.

Reports from Green Bay say that fishing is over there and but little is doing now among the packers. There is no fish at Fortune Bay while at Placentia Bay, some fair catches were made recently, although no encouragement can be taken from any prospects there.

With the scarcity of fish, Newfoundland herring is bound to soar in the market. Coupled with the scarcity, is an advance in price, which it has been found necessary to pay the Newfoundland fishermen, all of which is bound to make itself felt, when the fish reach the American market.

There is every prospect that Shelbourne will shortly be prepared to supply fishermen with bait. Mr. George R. Earl, of Yarmouth, Manager of the Consumers' Fish Co., was in town recently and he says his company purpose putting up a bait storage room here at once. A large number of fishing vessels call here to land fish and in search of bait and we trust that the bait freezer will be a reality in the near future.

CANADA'S FISHERIES FOR NOVEMBER 1916

(Furnished by the Naval Service Dept.)

On the Atlantic coast the weather was generally unfavourable throughout the month. Cod and haddock were abundant in the inshore waters and when the weather permitted line fishermen to operate, good catches were secured. It is reported that steam trawlers landed good catches at Canso.

From Halifax Harbour westwards to Yarmouth county shore fishermen were engaged preparing their gear for the lobster season, which opens on the 15th of December. Fishing operations on that section of the coast were thereby limited — except at Lockport and Yarmouth where there are vessels at work.

Notwithstanding much rough weather the month's total of cod landed in the whole of Nova Scotia is over 6,000 hundred weights greater than that for the same month last year; while the total of haddock landed is over 14,000 hundred weights greater.

On the other hand herring landings fell away to almost nothing, the quantity being 3,000 cwts. against

64,000 last year. To Canso, Lockeport, and Digby are due the credit for the increased cod and haddock figures. Two Shelburne county fishermen were drowned during the month.

The new lobster fishing season opened in St. John and Charlotte counties on the 15th of the month. Lobsters appeared to be plentiful on the usual grounds, but bad weather interrupted the fishery considerably and caused a good deal of damage to gear. The total quantity landed so far is therefore less than that for the same period last year. The figures are:

November 1915 2,856 cwts.

November 1916 1,726 cwts.

Very little fishing was carried on in any part of the gulf other than for smelts and oysters.

Rough weather prevailed on the Pacific coast, consequently the landings of halibut for the month fell short of those for November last year by over 10,000 cwts.

Herring were plentiful in the Nanaimo and Alberni districts, and it is noteworthy that over 13,000 cases were canned during the month.

Summary of the Quantities and Values of all Sea Fish caught and landed in a Fresh or Green State; and an estimate of the Quantities Marketed, or intended to be marketed, fresh, dried, pickled, canned, etc., in the **WHOLE OF CANADA**, for the **MONTH OF NOVEMBER, 1916.**

Totals for the Month of **NOVEMBER, 1915.**

Kinds of Fish.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Cann'd, etc.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.
	Quantity.	Value.		Quantity.	Value.	
Salmon, cwts.	96,079	\$396,311	77,913	72,096	\$261,628	59,065
Salmon used fresh, or frozen, cwts.			21,612			8,931
Salmon canned, cases			7			11
Salmon smoked, cwts.						4,408
Salmon salted (dry), cwts.						
Lobsters, cwts.	1,726	38,970		2,856	50,558	
Lobsters shipped in shell, cwts.			1,726			2,865
Cod, cwts.	47,207	124,067		37,384	79,997	
Cod used fresh, cwts.			11,431			8,697
Cod smoked, cwts.			594			10
Cod green-salted, cwts.			7,725			3,354
Cod smoked fillets, cwts.			296			223
Cod dried, cwts.			6,084			7,096
Haddock, cwts.	42,231	118,688		26,757	54,203	
Haddock used fresh, cwts.			18,636			8,919
Haddock canned, cases.			585			250
Haddock smoked, cwts.			7,434			6,977
Haddock green-salted, cwts.			280			41
Haddock dried, cwts.			2,411			1,132
Hake and Cusk, cwts.	13,385	17,669		15,034	15,936	
Hake and Cusk used fresh, cwts.			979			526
Hake and Cusk smoked cwts.						1,000
Hake and Cusk green-salted, cwts.						38
Hake and Cusk smoked fillets, cwts.			104			639
Hake and Cusk dried, cwts.			4,033			3,503
Pollock, cwts.	8,003	10,727		7,050	8,846	
Pollock used fresh, cwts.			550			228
Pollock dried, cwts.			2,485			2,273
Herring, cwts.	79,311	87,573		130,695	138,333	
Herring used fresh, cwts.			8,990			68,038
Herring canned, cases.			13,460			750

Herring smoked, cwts.			534			1,565
Herring dry-salted, cwts.			31,000			26,642
Herring pickled, brls.			400			2,690
Herring used as bait, brls.			2,965			2,820
Mackerel, cwts.	7,006	44,439		4,567	25,909	
Mackerel used fresh, cwts.			5,293			2,491
Mackerel salted, brls.			571			692
Alewives, cwts.	15	60		12	24	
Alewives used fresh, cwts.			15			12
Sardines, brls.	22,685	95,340		29,150	43,670	
Sardines canned, cases.			17,000			13,631
Sardines sold fresh and salted, brls.			19,285			26,075
Halibut, cwts.	16,763	93,140		27,678	140,721	
Halibut used fresh, cwts.			16,763			27,678
Soles, cwts.	490	1,572	490	242	968	242
Flounders, cwts.	286	347	286	280	391	280
Skate, cwts.	325	325	325	255	198	255
Smelts, cwts.	3,510	19,935	3,510	2,256	13,027	2,256
Whiting, cwts.	2	6	2	8	16	8
Tom Cod, cwts.	173	153	173			
Octopus, cwts.	5	35	5	28	168	28
Swordfish, cwts.				15	75	15
Oysters, brls.	3,271	15,341	3,271	3,106	10,858	3,106
Clams, brls.	2,181	3,409		1,726	2,130	
Clams used fresh, brls.			699			658
Clams canned, cases.			1,482			1,068
Scallops, brls.	750	1,875		530	1,360	
Scallops shelled, gals.			1,500			1,060
Crabs, Cockles, etc., cwts.	447	1,796	387	294	1,108	294
Squid (bait fish, brls.	606	2,605	606	324	1,328	324
Total value		\$1,074,383			\$851,452	

FOR SALE

Schr. **VIOLET M. HUTT**, 23 tons, 2 years old. Will be sold as a bargain fully equipped with **dories and fishing gear**. For particulars apply Reuben Hutt, Owls Head, Halifax Co., Nova Scotia.

SALMON FOR RUSSIA.

The Canadian Trade Commissioner at Petrograd, Mr. C. F. Just, states that in any readjustment of the Russian tariff in favour of the Allied countries, a reduction in the duties on canned salmon would be a matter of great importance to Canada in view of the potentialities of the Russian market for this article if it can be brought within the reach of the masses. The Russian people are great fish users, and as one of the results of the war has been to reduce the meat supplies of Russia to a point from which it will take years to recover, it is believed that the city population, on account of the high price of meat, will turn more than ever to a fish diet.

GIVE PRIVILEGE TO FISHERMEN.

In order to prevent persons of enemy nationality in Canada, under the guise of neutrals, a regulation has been adopted providing that no alien master or member of the crew of a vessel arriving at a Canadian port, shall be allowed to land without the production of proof that he is not an alien enemy. An alien may, however, land for a temporary purpose, by permission of the Customs or Immigration officials, and the regulations do not apply to United States fishermen visiting Canadian ports for purposes authorized by treaty.

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THE CANADIAN FISHERMAN

A MONTHLY JOURNAL DEVOTED
TO THE COMMERCIAL FISHERIES
OF CANADA AND NEWFOUNDLAND
THE SCIENCE OF THE FISH CULTURE
AND THE USE AND VALUE
- OF FISH PRODUCTS -

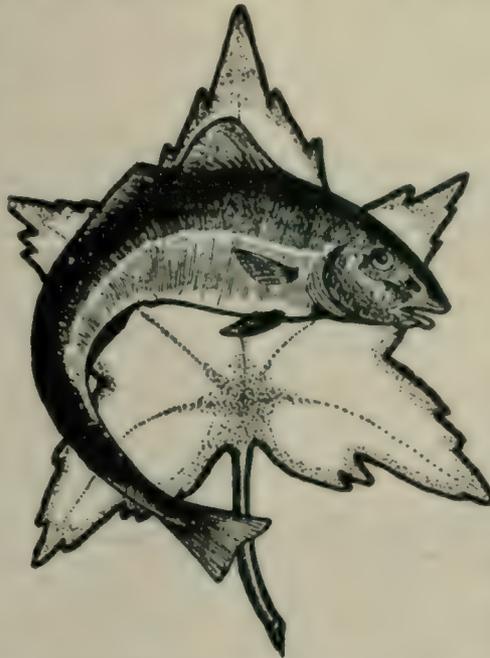
F. WILLIAM WALLACE
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The Industrial & Educational
Press, Limited

35-45 St. Alexander St. - Montreal
CANADA

Toronto Office - 263-265 Adelaide St., W.
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Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, FEBRUARY, 1917

No. 2

Second Annual Convention, Canadian Fisheries Association, Montreal, Monday, Jan. 29, 1917

The Second Annual Convention of the Canadian Fisheries Association was held in the Windsor Hotel, Montreal, on Monday January 29th, 1917. It was a purely business meeting in keeping with war-time and the unusual developments in the Fishing Industry of Canada. Owing to the season and the difficulty which most of our members found in leaving their business at this time, the attendance was not as large as it would have been had the meeting been held later, but notwithstanding the absence of distant members, the meeting was representative of all branches of the trade.

Among those present were Mr. D. J. Byrne, President, Montreal; Mr. S. Y. Wilson, Vice-President, Halifax; Mr. W. R. Spooner, Montreal; Mr. A. H. Brittain, Montreal; Mr. F. T. James, Toronto; Mr. C. P. Rhodes, Calgary; Mr. T. W. C. Binns, Ottawa; Mr. Moise Lapointe, Ottawa; Mr. Emery Lapointe, Ottawa; Mr. J. N. McIntosh, Ottawa; Mr. J. A. Paulhus, Montreal; Mr. Jos. T. O'Connor, Montreal; Mr. Russel Hodge, Montreal; Mr. H. G. Connor, Montreal; Mr. H. Welham, Montreal; Mr. W. S. Loggie, M.P., Chatham, N.B.; Major Hugh A. Green, Saskatoon; Mr. J. J. Harpell, Montreal; Mr. Walter Lambert, N.A., Montreal; Mr. T. J. McKenna, Montreal; Mr. W. Morse, Montreal; Mr. F. W. Wallace, Montreal — all connected with the production and distribution of fish. Mr. James White, Vice-Chairman of the Commission of Conservation, and Mr. J. B. Fielding, F.Z.S., also of the Commission, attended the Annual Meeting and the Dinner.

After registration of members, the Executive Committee went into session at 10.30 a.m.

Date of Annual Meeting Changed.

In view of the fact that so many members had advised the Executive of their inability to leave their business and attended a Convention in the winter months, the Committee discussed altering the date of the Annual Meeting. After considerable discussion, a day, or days, in the month of August was recommended and it was proposed that the Meeting be made in the nature of a two or three day Convention to which the members could bring their wives. By holding the Convention in the summer months, it would be more of a vacation with business and pleasure combined, and travelling would be pleasanter. The recommendation was well received and tabled for the consideration of the members at the afternoon Annual Meeting.

Head of The Lakes Branch, Canadian Fisheries Association.

The President announced that the Head of the Lakes Branch of the Canadian Fisheries Association had been successfully formed according to the By-Laws and Constitution of the C.F.A. The headquarters of this Branch is in Port Arthur, Ont., and the membership is made up of fishermen and producers of the Western portion of Lake Superior and district. Mr. F. Bowman is Chairman and Mr. T. Craigie, Secretary. It was moved by Mr. Brittain and seconded by Mr. Wilson:—"That this Executive Committee ratify and accept the formation of the Head of the Lakes Branch

of the Canadian Fisheries Association." The motion was carried unanimously.

Election of Officers for 1917.

Owing to the fact that a number of nominees failed to qualify for officers and directors by numbers of nominations necessary for election under our By-Laws, it was proposed that the nominations received be put up for election by ballot before the members assembled at the Annual Meeting. It was therefore moved by Mr. Spooner and seconded by Mr. Binns:—"That Article 4 of the Constitution and By-Laws be temporarily suspended for the election of officers at this election." Carried unanimously.

Lake Erie Fishermen's Association.

A communication was read from the Lake Erie Fish-

ermen's Association inviting the Secretary (Mr. Wallace) to attend their Annual Convention at St. Thomas, Ont., on Feb. 7th & 8th. The Secretary was authorized to attend and was empowered to discuss with them the question of affiliation. Moved by Mr. James, seconded by Mr. Brittain.

Membership Committee.

For the purpose of making the Association's objects known among all engaged in Canada's Fishing Industry and increase the membership, it was moved by Mr. Brittain, and seconded by Mr. Spooner:—"That the Executive recommend to the Annual Meeting, the formation of a Membership Committee." Carried.

Several other matters came up for discussion at the Meeting and the members adjourned for lunch at 2 p.m.

Annual Meeting Canadian Fisheries Association

The Annual Meeting went into session at 2.30 p.m. When the members were seated, President D. J. Byrne, opened the meeting by reading his report of the year's work. The Report of the Transportation Committee was read by its Chairman, Mr. A. H. Brittain, and that of the Publicity Committee, by Mr. J. A. Paulhus. The Financial Statement was read by the Secretary, Mr. F. W. Wallace. All the Reports were approved of by the members and the work of the President, the Committees and the Secretary heartily appreciated.

Mr. J. B. Feilding, F.Z.S., addressed the meeting on the utilization of fish offal and waste. He pointed out that from 25 to 75 per cent of the various species of fish caught by Canadian fishermen constituted absolute waste. By treating this waste with chemical and other processes, it was possible to produce excellent animal and poultry feed, fertilizers, and various kinds of fish oils. Could the present waste be taken care of and utilized, the value of our fisheries could be greatly increased, and

the fishermen and farmers benefitted thereby. It was the opinion of the members that Mr. Feilding should be encouraged in his work for the advancement of our Fishing Industry.

An excellent paper on "Advertising Fish" was read by Mr. T. W. C. Binns of the Matthews-Blackwell Company, Ottawa — a practical fish man who believes in the value of advertising. This paper, along with some of the Association Reports, is published in this issue of the CANADIAN FISHERMAN.

"Marine and Fisheries" Instead of "Naval Service"

After some discussion, the Canadian Fisheries Association was unanimous in supporting the following motion: — "That the Association puts itself on record that the name of the Government Department administering the Fisheries be changed from "Naval Service Department" to "Marine and Fisheries Department."

Honorary Members.

The Hon. J. D. Hazen, K.C., L.L.D., Minister of Marine and Fisheries, was unanimously elected Hon-

February Fish Day Calendar

1917		FEBRUARY					1917
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	
				1	2	3	
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	
25	26	27	28				

February 21st, Ash Wednesday, Feb. 28.
16 Fish Days in Lent, and every Tuesday is a Fish Day also.

March Fish Day Calendar

1917		MARCH					1917
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	
				1	2	3	
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	
25	26	27	28	29	30	31	

March 3rd, Ember Days.
16 Fish Days in Lent, and every Tuesday is a Fish Day also.

orary President of the Association for the year 1917-8. Mr. James White, Vice-Chairman of the Commission of Conservation, was elected to Honorary Membership, and at the meeting, expressed his desire to work in harmony with the fishing interests for the progress and development of the Industry

Election of Officers, 1917-8.

Nominations for Officers and Directors were read out and voted upon by ballot. Mr. D. J. Byrne, who was again nominated in conjunction with Mr. S. Y. Wilson of Halifax, for the Presidency, retired from the nomination and declared in favour of Mr. Wilson whose election was unanimous both by nominating vote and the wish of the members present. The voting resulted as follows:

PRESIDENT—Mr. S. Y. Wilson of A. Wilson & Son, Halifax, N.S.

FIRST VICE-PRESIDENT. Mr. A. H. Brittain, Maritime Fish Corporation, Ltd., Montreal.

SECOND VICE-PRESIDENT. Mr. A. L. Hager, Canadian Fishing Co., Ltd., Vancouver, B.C.

SECRETARY-TREASURER. Mr. Frederick William Wallace, Editor "Canadian Fisherman", Montreal.

Provincial Directors.

QUEBEC. Mr. J. A. Paulhus, D. Hatton Coy., Montreal.

Mr. W. R. Spooner, Fish Dealer, Montreal.

Mr. H. A. Letourneau, Fish Dealer, Montreal.

ONTARIO. Mr. F. T. James, F. T. James Co., Ltd., Toronto, Ont.

Mr. T. W. C. Binns, Matthews-Blackwell Co., Ltd., Ottawa, Ont.

Mr. Emery Lapointe, Fish Dealer, Ottawa, Ont.

NEW BRUNSWICK. Mr. W. F. Leonard, Leonard Fisheries, Ltd., St. John, N.B.

Mr. P. W. Connors, Connors Bros., Black's Harbor, N.B.

Mr. W. S. Loggie, M.P., W. S. Loggie & Co., Chatham, N.B.

NOVA SCOTIA. Mr. H. B. Short, Maritime Fish Corporation, Ltd., Digby, N.S.

Mr. Arthur Boutilier, National Fish Co., Halifax, N.S.

Mr. W. M. Hodge, Lockeport Cold Storage Co., Ltd., Lockeport, N.S.

PRINCE EDWARD ISLAND. Hon. John McLean, Matthews & McLean, Souris, P.E.I.

Mr. Clarence F. Morrissey, Fish Dealer, Tignish, P.E.I.

BRITISH COLUMBIA. Mr. George Cassady, Columbia Cold Storage, B.C. Packers Ass'n, Steveston, B.C.

Mr. F. E. Burke, Wallace Fisheries Ltd., Vancouver, B.C.

Mr. T. H. Johnson, Can. Fish & Cold Storage Co., Ltd., Prince Rupert, B.C.

Mr. J. A. Thompson, Can. Fish & Cold Storage Co., Ltd., Prince Rupert, B.C.

MANITOBA. Hon. Hugh Armstrong, Armstrong Trading Co., Portage la Prairie, Man.

Mr. W. Douglas, Guest Fish Co., Winnipeg, Man.

ALBERTA. Mr. C. P. Rhodes, P. Burns & Co., Calgary, Alb.

Mr. Jos. T. O'Connor, Fish Dealer, Montreal (Acting Director).

SASKATCHEWAN. Major Hugh A. Green, Saskatoon, Sask. (On active service).

Mr. J. N. McIntosh, Fish Dealer, Ottawa. (Acting Director).

The following gentlemen were nominated as Chairmen of the various Committees. **TRANSPORTATION COMMITTEE**, Mr. W. R. Spooner, Montreal. **EDUCATIONAL & PUBLICITY COMMITTEE**, Mr. J. A. Paulhus, Montreal. **GENERAL IMPROVEMENT COMMITTEE**, Mr. H. B. Short, Digby, N.S. **MEMBERSHIP COMMITTEE**, Mr. A. H. Brittain, Montreal. **Past Presidents to be Members of Executive Committee**

The following resolution was passed. "Resolved—that all past Presidents be ex-officio members of the Executive Committee." Carried.

Annual Meetings.

The motion of the Executive regarding the date of future Annual Meetings was put before the meeting, and it was moved: "That the next Annual Meeting be held in the month of August 1918. Date and place of meeting to be decided upon by the Executive Committee." Carried unanimously.

Membership Committee.

The motion to form a Membership Committee was read and the motion passed.

Revision of Fees.

The Committee considering the revision of Membership Fees reported that for the present they would favour the retention of the present scale of fees in order that fishermen and small dealers be brought within our membership. The Chairman, Mr. James, suggested that additional funds for Association work be subscribed from among the members until such time as the Association was self-supporting.

Conclusion of Business.

The meeting concluded business at 7 p.m., when the new President, Mr. Wilson arose and thanked the members for electing him to the Presidency of an increasingly important Association. He referred to the work of the ex-President, Mr. Byrne, in terms of sincere appreciation and voiced the hope that during his term of office he would keep up with the pace already set him by the retiring officer. "The fisheries of Canada", said Mr. Wilson, "are becoming of greater value and importance every day. The Association came into existence at the right moment and there is a great work for us to do in developing a market at home: educating both the producer and the consumer; watching transportation in order that the Industry might not be stifled, and making recommendations unceasingly until the Fisheries attain — not the name of "a great national asset" but "the greatest national asset of Canada". To adequately carry out the work before us, I look for the earnest support of the gentlemen present and our absent members."

The Meeting concluded with a hearty vote of thanks to the ex-President, Mr. D. J. Byrne, the Chairmen of the various Committees, and the Secretary, Mr. Wallace. All the members then repaired to the Oak Room where the Association's Annual Dinner was held.

Annual Dinner Canadian Fisheries Association



AS this is a War Year and ostentation is looked upon as being "bad form", the powers that be in the Canadian Fisheries Association decided that this year's Annual Banquet would be a purely informal affair—a "get-together-bite-and-sup" where a man could feel at ease among his fellows and not be strangled in a high dress collar or feel that he has been "shoe-horned" into a dress suit. So the meal was not dignified by the name of a Banquet. It was called just plain "Dinner", though, if one will glance through the Menu appended herewith, it could easily have been designated with the more aristocratic nomenclature.

— MENU —

"Thank God we don't have to eat war rations here!"

Celery	Olives
Shemogue Oyster Cocktail	
Bisque of Lobster Byrne	
Consomme a la Barker	
Fillets of Striped Bass Wilson	Potatoes Brittainese
Vol au Vint Paulhusiane	
Gosling, Stuffed Avec Sauce Hagerine	
Flageolets Beans	Bermuda Potatoes a la James
Salad Douglas	
Ice Cream Spoonerian	
Petit Fours	
Assorted Cheese	Crackers
Tea	Coffee

"Just think how they'd appreciate this dinner in Berlin now!"

The Menu Card bore the crest of the Association and was elaborated with some doubtful poetry—said to have been written for the occasion by Alfred Noyes—and which, in the opinion of Major "Hughie" Green, should be set to music and sung as the National Anthem of the Fish Trade. This Noyes-some effusion is herewith set down:

"Not only the men at the Front
With bayonet, bomb and gun—
Not only the men of the Fleets,
Are engaged in strafing the Hun.
Remember the ones at home—
The toilers at net and trawl
Who're fighting the waters in storm and shine—
Providing food for us all."



OF COURSE, being a gathering of fish men, anything in the shape of meat would have been rank, poison to us, therefore fish was the principal feature, though "Gosling, stuffed, avec sauce Hagerine" appeared as a break in the menu—just to keep us from being too conceited and imagining that there was nothing else to eat in the world but fish. There were other things too—liquid things—that do not appear in the menu. We distinctly remember a "Finnan Haddie Cocktail" the secret composition of which was bequeathed to Brother Brittain by an ex-barkeep on his death-bed. They say that

Alf keeps the recipe in a Trust Deposit Vault and only brings it out at C. F. A. Annuals. Suffice to say, it's a good drink and it has been sampled by a good many notables in the fish world.

There was champagne too, but that seemed to hover up where the notables were seated. I never noticed any coming down towards the foot of the table. Nectar may be the drink of the Gods; Tokay may be the wine of Kings, but I think champagne—Mumm's the word—is the liquid refreshment of Canadian Fisheries Association Presidents, ex-Presidents, Committee Chairmen, and the guests. The common herd have to be content with what comes their way.

When the diners arrived at that stage of the menu where the coffee and cigars are passed around, all the coming speech-makers "cleared for action" as it were, by taking a last drink and giving themselves up to soulful contemplation of the subject they thought they would be slated for. The King's health was drunk, the National Anthem sung, and then President Wilson (Sam—not Woodrow) proposed the toast of "Our Fighting Men" and called upon Major Green for a response.

Our "Fish-Monger General" opened his remarks with a pathetic picture of the fighting fishermen in Scotland. He had visited famous fishing ports in the Highlands where none but boys, old men and women were left; where the boats had laid above tide-water for two years and the nets were still on the drying racks as their owners had left them to go to the war. Many of the Scots fishermen would never return. Whole villages had been bereft when the "Aboukir", "Cressy" and "Hogue" were torpedoed: hundreds had perished in the mine-fields and on naval auxiliaries, and others, soldier reservists in the kilted Highland regiments fell during the retreat from Mons. But their spirit was not dead, as the boys would take their place in the fisheries of the future, and in far-off Canada, the Canadian fishermen were engaged in supplying the needs of the present. Turning from pathos to humour, the Major told of his experiences in France. Arriving in a small town a safe distance, as he thought, behind the firing line, he noticed that the buildings and streets had the appearance as if an earthquake had struck the vicinity. As the Huns had never been anywhere nearer the town than 20 miles, the Major could not understand it, and made enquiries of a French officer. "Oui, m'sieu," he replied. "On clear days, the Boches drop shells from their big guns on the town." The Major admits that he anxiously scrutinized the appearance of the weather and telephoned Headquarters for a car to take him out of town as it looked like clearing up! Hughie is modest, however, and we know he has plenty of nerve. It is recorded that he told Sir Sam Hughes, that if the transports could not get Canadian fish to the boys in the front-line trenches, he'd take it to them himself in a wheelbarrow—and we believe he would.

The toast of "Our Fisheries" was responded to by ex-President Byrne, and no one could have done more justice to the subject than he. Apart from being in the business, and a naturally eloquent speaker, Mr. Byrne had a fine training, as President of the Canadian Fisheries Association, and as such, he had spoken

on many occasions before American Conventions, Rotary Clubs, Conservation Commissions, and newspapermen, on Canada's Fisheries. Invariably, after these orations, we felt that it was worth while being connected with Canada's Fishing Industry. President Wilson (Sam—not Woodrow) remarked that once upon a time a man would be ashamed to say that he was connected with the Fish business. It was looked upon as a scurvy occupation, but nowadays, all was changed. The fish men today were among the best in the Dominion. They were Senators, Members of Federal and Provincial Parliaments, Mayors of towns, shining lights in Boards of Trade and Chambers of Commerce, and very often leading society in their localities. Indeed, one only had to be present at a Fisheries Association dinner, or look over the C.F.A. membership list to see what a solid aristocratic crowd we were.

Mr. J. B. Fielding, F. Z. S. spoke upon the utilization of fish waste and his remarks were followed with interest by the members. There is no doubt whatever but what scientific research along the lines of Mr. Feilding's hobby, is of the utmost value to the Industry and would be greatly appreciated by all engaged in it.



MR. F. W. WALLACE, Secretary of the Association, responded to the toast of "Our Fishermen". In doing so, he said that he was only paying a tribute to many hundreds of personal friends and shipmates on both the Pacific, Atlantic and Great Lakes. He characterized our fishermen as being the finest and most daring seamen afloat today, and had a Naval Reserve been in existence in Canada, they too would have shown as much courage and resource as the fishermen reservists of Great Britain. After relating several anecdotes of their nerve and hardihood, Mr. Wallace voiced the hope that opportunities would be given promising young fishermen to absorb something of a technical education in fishery work so that they may return to their shipmates and preach the gospel of up-to-date methods in fishing and handling fish.

President Wilson then read a communication from one of our fishermen members reading as follows:

ARICHAT, C. B., January 15th, 1917.

Mr. Chairman and gentlemen of the CANADIAN FISHERIES ASSOCIATION assembled.

As I am unable to attend this Annual Meeting owing to the fact that I have just finished haddock fishing, which has been one of the best seasons in the history of the Industry both in price and in the amount caught.

I hereby wish to thank the Canadian Fisheries Association for the good work done in the Fishing Industries of this country. We owe to your assistance, the good prices we have enjoyed this season.

Wishing you all a prosperous season in fish business and a continuation of the good work already done, I remain, yours truly,

(Signed). CAPTAIN FRANK YOUNG,
Fisherman, Arichat, C. B.

The President remarked, after reading this communication, that if the fishermen would only keep in touch with our work and join the Association, they would undoubtedly learn to appreciate it and would value their occupation more. The average fisherman, however, is a singularly independent individual and rarely bothers himself about anything outside of catch-

ing a trip of fish. There were a number of fishermen members of the Association and these men were of the best class and took an interest in the development and progress of the fisheries. They kept in touch with all developments through the Association's bulletins and the official organ—the CANADIAN FISHERMAN—and as a consequence knew all that was being done to increase the consumption of fish at home and abroad, and what was being done by others in improving fishing methods and marketing little used fish. The fisherman, well informed and intelligent, was a better fisherman and kept pace with the times, and the day would come when the men of the trawl and twine would realize the value of belonging to an Association which could do so much for them.



THE next toast on the list was "Ourselves". Why not? Were we not worth toasting? One wishes success to a growing Industry, a growing Association, and an increasingly valuable National Resource, and we, ourselves, had a great deal to do with the whole thing. As we did not all wish to brag, Mr. J. A. Paulhus, Chairman of the Publicity Committee did the talking for the crowd, and prefaced his remarks by saying that "we were a fine bunch!" which was loudly applauded. A little egotistical, no doubt, but we had something to boast about. In the past, the fishermen hid their lights under a bushel, but nowadays we dawned upon the world as participators in a thirty-five million dollar industry—an industry with only the sky as a limit to its possibilities and exploiting the greatest fishery resources in the world.

Mr. Paulhus sounded a note of extreme optimism. He voiced the opinion that our fishing industry was coming out of the dark and into the light. We possessed a great future, and if we, ourselves, watched our step and proceeded boldly, we should be marching along the macadamized road of Progress. We were already on the way in spite of a World War, and when the fighting was all over, we'd be still on the march. In blazing the trail, the Association had done much, but it had still much to do in removing the snags and obstacles of ignorance and prejudice, and it behooved all in the Fisheries to pull together and fight for the common weal.

The standard of progress had been raised when the Association came into existence, and an ever increasing army was following the flag. The times were showing a Renaissance; fish was being more appreciated as a food by our citizens, and the Association was fighting to give the consumer more fish, better fish, and cheaper fish.



MR. T. W. C. BINNS followed and gave opinions from a retailer's point of view — all solid, good talk providing food for thought. However, one must not gain the impression that the Association dinner was all prose and speeches. The Fish Monger General, Major Hughie Green, obliged with an Irish song entitled, "The Mountains of Moran". For a braw Scotsman, Hughie sang in Irish very well and warmed the hearts of the Byrnes, O'Connors and M'Kenna's present. Friend Hughie possesses many natural resources. Aggressiveness, nerve, vim, humor, faith in his business and a mellow voice are his, and when listening to the latter, we could imagine that if all else failed, Hughie could be driving a fish cart and captivating the housewife by crying his wares

"Fresh lake whitefish, jist from the watter, and only five cents a pun'!"

The diners being mostly sober married men and examples in their particular home spheres, when the witching hour of midnight approached, they arose to

the tune of "Auld Lang Syne" and departed their various ways. Retrospection of this year's Annual gives one a feeling of satisfaction with a sense of optimism for the future. The next Annual in August 1918 promises to be a "hummer". Let's hope that all who read this will be there.

President's Address Canadian Fisheries Association

To the Officers and Members.

Gentlemen:—

In presenting the Annual Report for the year which has just closed I have deemed it advisable to draw your attention to the changed conditions, caused to a large extent by the European war, which have affected our industry in many ways. The production of fish on both the Atlantic and Pacific Coasts, as well as on the lakes and rivers, has not been so great as in former years. This is accounted for in part by the shortage of labor, which has been general and has similarly affected all other industries.

The partial closing of the North Sea fisheries has made for a decided shortage in Europe, to relieve which our Government arranged for shipment of quantities of Canadian fish to England, not alone to supply the Canadian troops in training camps there, but also for the Imperial troops, so that we may fairly claim for those engaged in the fishing industry a share in the work of helping to provide food requirements for the Empire's soldiers, which is a patriotic duty devolving upon us.

Overseas Shipments.



THE effect of shipping quantities overseas, combined with shortage in production, has tended to advance prices and I have deemed it my duty to explain the causes in a general way, in order to correct the wrong impression which prevails in some quarters,—that the high prices now obtaining for practically kinds of fish products is due to any effort at control, but rather is it the result of the extraordinary conditions referred to above.

We realize that the business recently developed for Canadian fish in England is but temporary and is one of the direct results of the war, also that when peace comes this trade will disappear as soon as normal conditions return in Great Britain and a large number of the men who have been recruited for the army and navy from the ranks of British fishermen have again returned to their normal pursuits. So long as the war lasts quantities of fresh, frozen, smoked, canned and salted fish will continue to be shipped from Canada to the Mother Country and this shortening of supply for the local trade must have the effect of enhancing prices to the Canadian consumer.

It will no doubt interest our members to learn that large quantities of frozen fish shipped by steamers from various Canadian ports under refrigeration, have reached destination in good condition and proved to be so satisfactory that the Imperial authorities decided to procure further supplies and have placed orders for quantities which are only limited by our capacity for production.

It will afford pleasure to our members to know that this important assistance from Canada was the result

of sample shipments forwarded to England under the auspices of our Association from the port of Montreal during the summer of 1915 and it is also a source of pride to the Canadian Fisheries Association that the handling and distribution of these fish were under the direct personal supervision of Major Hugh Green,—a member and director of this Association, whose technical knowledge of fishery products and methods of transportation thereof were largely responsible for the success of the venture.



IT has been proven beyond doubt that the fishery products of this Country can be shipped overseas and landed in good condition, which means that the market for Canadian fish in future will be world-wide for frozen and smoked varieties, as it has been in the past for our salt cured and canned fish.

Home Markets.



NOTWITHSTANDING the development of overseas trade in our line the Association has devoted, as usual, most of its energies to the development of trade in our home market. It has been our aim and endeavor to popularize fish as a regular article of food, and economical as well as healthful substitute for meats and for this purpose we have in every way possible endeavored to educate the Canadian people to the advantages of fish as a regular diet instead of an occasional substitute for other foods.

With this end in view the Association deemed it advisable, following the precedent established February 29th, 1916, which was made a National Fish Day, to repeat this experiment on Tuesday, October 31st, 1916. A large amount of advertising matter was distributed, advertising by individual members in trade and daily papers, also a lot of general work with this end in view resulted in a decided success. The efforts put forth by Directors and Members of your Association were not only to make Tuesday, October 31st, 1916, a National Fish Day, but also to make it generally known that every Tuesday would be a Fish Day and dealers were encouraged to stock fresh supplies so that consumers can depend on obtaining their requirements in a large variety of edible fish from their local suppliers practically every day in the week.

Publicity.



YOUR Publicity Committee put forth great efforts in this direction and by disseminating reading matter of various kinds succeeded in making the venture a decided success. It may be well to mention that our example has been followed by similar Associations in the United States, inaugurating a National Fish Day last November and their imitation of our efforts along these lines may be considered as very flattering.

I will not deal further with this subject, which will be fully covered by the report from our Chairman of the Publicity Committee, but it would be well to note that as a result of this and similar efforts on the part of our Association the demand for fish throughout Canada has shown a decided increase and now bids fair to become a staple article of food with our people, thereby affording a greater variety of edible foods which are of Canadian origin.

Transportation.



ONE of the great problems, if not the greatest connected with the handling and marketing of our fishery products, is that of transportation and in this connection I would ask your careful attention to the report of the Chairman of the Committee on transportation, which will cover this important question in full detail.

It has been due to the constant watchfulness of our Members composing this Committee that recent efforts on the part of transportation Companies to increase rates or modify service existing, have been frustrated and I would urge upon our Members, not only the advisability, but the absolute necessity of promptly reporting all matters connected with their transportation troubles, such as delays in service, unfair increases in tariffs and any modifications which may be attempted with a view to restricting or curtailing the service to which they are entitled, so that these matters may be investigated and corrected if deemed unfair by your Committee, even to the extent of bringing them before the highest tribunal for adjudication, should this become necessary.

During the past year we have been successful in having withdrawn two distinct cases of this kind,—one affecting free cartage of fresh fish in carlots at distributing points, which had been cancelled and another case involving a decided increase in tariff rates,—both of which were disallowed.



SEVERAL Members of your Association appeared and gave evidence before the fisheries Committee of the House of Commons during the inquiry held last year at Ottawa, which have already produced some beneficial results, while the recommendations of the Committee in their report lead us to believe that further improvements in the transportation services, as well as other matters dealing with the handling and distributing of fish will be of benefit to our Members and all those engaged in the industry.

A Meeting was also arranged by the Superintendent of Fisheries, at which Members of your Executive Committee met the Officials of the various Railways and Express Cos. at a meeting held in Montreal last June. The object of the Meeting was to obtain for the fisheries an improved Express service on Canadian Government Railway lines, with more adequate equipment for transportation of perishable fish, but I regret to say that the promises made were not fully carried out, and in this connection we should insist on proper facilities being provided for the safe shipment of fresh fish packed in ice, as well as perishable smoked fish, by providing separate insulated refrigerator cars for shipment from points of production to the various distributing centres in the interior.



IT is an absolute fact that the full development of the fish trade in Canada and the development, as well as the increase for home consumption has been seriously retarded by

obsolete methods of transportation which are still in vogue and which it has been our constant effort to improve. We should insist that Railway and Express Companies carrying perishable fish products provide up-to-date equipment for the purpose, because in no other way can the home market be developed to its fullest extent and it is quite safe to predict that when fresh fish can be delivered at consuming centres in the best possible condition the demand will increase to an extent which cannot be hoped for without these necessary improvements.

I would strongly recommend that the incoming Executive Committee spare no effort to secure the improved facilities and proper service from the various transportation Companies handling our products, from which they derive large revenues. I suggest that the assistance of the Naval Service Department of our Federal Government be again enlisted with this object in view.

Production.



DURING the past year the value of our fishery products again increased and now reaches a total of more than \$34,000,000, but if the industry is to be developed as one of our great national resources, which the fisheries of Canada undoubtedly are, it will be necessary to devote all the energies we can to bear upon the question of increased production.

Our market is world-wide and our fisheries are prolific, but we must have means provided to materially increase the quantities produced and this can best be done by the employment of modern fishing appliances without restriction and will require the hearty support, as well as the active co-operation of the Federal authorities to permit of full and free development with a view to minimizing the cost of production, also best possible means of transporting the products of our seas, lakes and rivers to distributing markets, so that the Canadian consumer will get the benefit of wholesome edible fish at a moderate cost, thereby providing our Canadian public with inexpensive food at reasonable prices and at the same time assist in building up the fisheries of Canada, which is not only a national, but patriotic duty.

It has become absolutely necessary to stimulate the production and in our efforts to do so we should have the active assistance of the Federal and Provincial Governments, as well as the transportation Companies in order to carry on these improvements.

Branches.



A BRANCH of our Association has recently been formed at Port Arthur, Ont., where an inaugural Meeting was held in December, 1916, and a request made to your Executive Committee to form this Branch under the name of the Head of the Lakes Branch of the Canadian Fisheries Association, at which Mr. F. Bowman acted as temporary Chairman and Mr. T. Craigie as Secretary. The institution of this Branch has been carried out by several Members of our Association and it will be for you, Gentlemen, to decide our future policy with regard to Branches at various fishing centres.

Our Secretary has also received an invitation to attend the Annual Convention of the Lake Erie Fishermen Association, which will be held in the near future and at which it is possible that the question of affiliation with the C. F. A. will be discussed.

Revenue.



IN view of the important work undertaken and carried out by your Association it is quite evident that our present revenues are not sufficient and I would strongly urge the advisability of re-adjusting the Membership Fees, which will permit a wider field and greater activity to carry on the valuable advertising work which has been of such great benefit to the industry at large.

The work connected with our Secretary's Office has now assumed decidedly large proportions and during the past year more than eleven hundred communications have been handled, including telegrams, enquiries and letters on various subjects connected with our work. There is also an expenditure for advertising posters and hand-bills in connection with National Fish Days, which amounted to more than three hundred dollars.

I desire to take occasion of this opportunity to express my personal appreciation to the unfailing courtesy and constant energy devoted to his work by our Secretary. During the past two years he has given freely of his time and undoubted ability to further the best interests of our Association and the industry which we represent and I would be failing in my duty to the office to which you have elected me, did I not

convey my tribute of appreciation and sincere admiration for all that Mr. Wallace has done during my term of office, for the best interests of the Association.

My thanks are also due to the Chairmen and Members of the Transportation and Publicity Committees for their constant devotion to our best interests, which have tended to make my term of office and the arduous duties connected therewith, rather pleasant than otherwise.



IN conclusion I wish to tender my thanks to all the members without distinction for the very high honour they conferred on me by electing me as your first President and to assure you that my best efforts have been gladly given to the cause which we all have so much at heart in the development of our fisheries.

I will also bespeak for my successor the same courteous and cordial support which I have at all times received to the end that it may be of lasting benefit and tend to place Canada's fisheries in the fore-front, so that they may keep the prominent place in our national resources to which they are entitled and thereby bring greater credit, with enlarging influence to the Canadian Fisheries Association.

D. J. BYRNE,
President.

Report of the Publicity Committee



FOR the second time it is my privilege to submit the work of the Publicity Committee. I will do it as concisely as possible. Firstly, I shall bring forward the inauguration of the National Fish Day. According to general opinion, it was a marked success. Launched out by the Publicity Committee, originated by its chairman, the idea was received with great favor not only by the Press generally, but also by the different Transportation Companies, the Trade and the Public. It was welcomed with enthusiasm in many sections of the Dominion, and it was given as wide a publicity as any movement of the kind could expect.

I should mention that the first article that was published on the subject by our magazine (written by the chairman) was taken up by a prominent railway official of the eastern provinces and distributed to 150 papers of this section of the country for reproduction.

Our local daily papers—the Gazette, the Star, the Herald, La Presse, La Patrie, Le Devoir, and commercial papers such as the Canadian Grocer, the Prix Courant, the Journal of Commerce, the Pacific Fisherman, gave articles in their editorial and news columns in which general efforts to foster the "Day's" success were evidenced; original and new ideas were contributed to influence the reading masses upon the advantages and the benefits that would accrue to everybody from participating concretely in the movement. I want to make special mention of the La Patrie and La Presse which devoted the front page of their respective papers to this object, with colored illustrations of fishing scenes most appropriate, and of a fine artistic effect.

The Publicity Committee distributed 70,000 posters for this Fish Day. These were a great help and received great favor and a wide distribution.

In the west the cards were placed on street Railway above named chairman appeared the following:—

cars and were conspicuous all over Canada, according to reports.



On the Second National Fish Day we distributed 150,000 hand-bills. Judging from results, I may say that they have been a good medium in announcing the object in view. In the western and the Pacific coast specially, the National Fish Day, besides being advertised as a business proposition was also kept as a social event. I have recorded the different communications received from leading captains of the fish industry and patrons of the fish business generally. Annexed to this report are a few letters that I have received personally, and some addressed to the secretary of the Association, and which can be perused at will by any member of this Association.

From all indications the National Fish Day is an established institution, and I would ask this Association to give it a last and final sanction now, and even to fix a stated annual date for its observance in Canada.

In my opinion it will be one of the biggest achievements to the credit of the Association and a lasting proof of its efficacy to interest our people in one of the principal sources of income and resource.



AMONGST the different articles on the fish interests published during the past year I may mention in order of date the following:

By the President of the Publicity Committee, Mr. J. A. Paulhus, in February 1916, a lecture was given before the Grocers' Clerks' Union on—"The history of our Fisheries and the value of Fish as a food product." This work was commented on largely, and the author received from the press and many individuals letters of appreciation and praise for the effort.

In the Canadian Fisherman also written by the

April, 1916, "Echo of the National Fish Day". July, 1916, "The coming National Fish Day". October, 1916, "Canada's National Fish Day, and Fish Days". November, 1916. "Montreal celebrates National Fish Day."

In the Canadian Grocer, by the same author, in October last:—"Another National Fish Day". In the Montreal Star, October, "Mobilize for Peace". In the Journal of Commerce, special November number, "Preparedness".

All these articles had for objective the development of our Fisheries a national asset.

I must mention also that the United States, following our initiative, decided to hold an inaugurated Fish Day in November last.

From the President of our Association, Mr. D. J. Byrne, we had timely communications in our official monthly Fishing journal, appealing to the people and to the trade in relation to the importance of our industry.

He also delivered an elaborate address—"The Economic side of the Fishing Industry" before the Commission of Conservation at Ottawa. We are also indebted to his activity as a member of the Rotary Club for a Special Fish Dinner of which many members of the club participated; the dining hall being decorated for the occasion with suitable mottoes and posters. This dinner took place on the very day of our Second National Fish Day, October 31st last.

Great credit is due Mr. T. W. C. Binns of Ottawa for the interesting series of Fish Talks he has given to the readers of the Free Press, Ottawa. These articles bear the imprint of originality and effectiveness, rarely and only attained by one truly conversant with the matter he has to deal with. One of these articles, recorded and filed with the present report, has been used as a model of the kind and distributed to their customers by a reputable firm at Boston, Mass. It is certainly a clever piece of work.

Other works of publicity, which space and time do not allow me to enlarge upon as much as I would like to, are the literary works of our genial secretary, Mr. Frederick William Wallace. I refer to the "Shack Locker", and "Blue Water". These novels I truthfully admit, are above my criticism. However, I want to recommend them to all lovers of the sea, fish life, and tales of the deep. The diffusion of these works, which are brimming over with pathos and humor, will help to encourage the prosecution of one of the best sides of the Fish Industry, particularly worthy of interest at this critical period we are now traversing, namely, the Production of Fish.

Mr. Wallace is also the nautical editor of the "Adventure" Magazine, and in that capacity he never loses sight of the fish interests.

It is also to him that we owe the Sea Films "Seamen Courageous" which has already been shown in the theatres of nearly all our principal cities.

These films show great daring and enterprise on the part of our secretary, and besides being attractive and interesting, are a great educator, and will help to show the importance of the vastness of our fisheries.

Both individually and in his official capacity, Major Hugh A. Green is a fervent preacher of the gospel of the Eat Fish propaganda. I don't believe anyone in the fish world has shown such devotion, such enthusiasm. He has been of incalculable service to our Association and to the fish industry by advocating the use of Canadian fish as food overseas. The Cold Stor-

age and Produce Review, published in London, England, under date September 21st last, gives an account of the Major in such glowing terms, pays such a tribute to his efficiency and ability, that it is useless for me to add more but to refer you to the article in question.

The Sun Life Assurance of Canada in its magazine "Sunshine" published last year in its industrial series a Fisheries number of 25,000 copies; data and photos being supplied by our secretary.

A few important articles have also appeared in our official magazine, the Canadian Fisherman, during the past year from the pens of Mr. Greenwood and Mr. Hayward of Vancouver, B.C. We expect to receive more contributions of the kind.

This sums up the work that has been done by this Committee during the past year. I am convinced that more educational work is needed. When one considers that of all food products used for consumption, fish figures only 2% of the whole amount, it appears to me strongly that more direct and forceful pleas, in favor of the usage of fish as a food, should be instituted and brought to bear effectively on the Consumer. This can best be done by appropriation of funds supplied by our governments, or by corporations, or individuals.

This Association has done a great deal, but with a limited capital at its disposal its work has not been so efficacious as the cause deserves.

Respectfully submitted.

J. A. PAULHUS.

MR. THOMPSON JOINS CANADIAN FISHERMAN.

Mr. Harold W. Thompson, who has just joined the Canadian Fisherman as its Ontario Representative, with headquarters in Toronto, is a native of the "Ancient Colony" and is well acquainted with the fisheries and the requirements of the trade. He was born in Newfoundland some thirty odd years ago, his father being formerly a well known journalist and member of Parliament, and now the occupant of a seat on the Bench.

Mr. Thompson obtained a thorough journalistic training under his father, and then launched out on his own "hook" and knows all about the troubles and tribulations of the man who tries to be editor, advertising manager, office boy and printer's devil at one and the same time. After a number of years experience in Newfoundland, he came to Canada, where he was engaged in both editorial and reportorial work. Eight years ago he joined the Hugh C. MacLean company, and by hard work and a thorough knowledge of his business, obtained a very large measure of success.

The Canadian Fisherman welcomes Mr. Thompson to its organization, and feels confident that he will soon number among his friends a large clientele of advertisers.

CHINESE FISH TRADE.

Shanghai, Dec. 11. There seems to have been a revival in the trade in Canadian fish; the figures for the last two years more nearly approaching those of 1910 than at any time in the interval. If shippers in Canada would more carefully study this market, and use greater perception in catering to the wishes of the Chinese who are engaged in this trade, there appears to be no reason why imports should not annually increase for the market is never overstocked.



The Advertising of Fish

By T. W. C. BINNS.
(Before Annual Meeting, C. F. A.).

Mr. President and Gentlemen:—



HAVING been requested by Mr. Wallace of the Canadian Fisheries Association to say a few words on the "Advertising of Fish" I have great pleasure in doing so.

While conscious of my inability to do justice to a subject of such importance, yet I feel that I may possibly touch on one or more points in connection with the greatest natural resource possessed by Canada which will cause some discussion from which much good will result to the great industry we have assembled from all parts of the Dominion to encourage.

Advertising signifies giving notice or announcing some fact or facts. Another definition is "giving publicity to ones business," — "To announce ones wishes or intentions by a public notice." Thus it will be clearly seen that there are many ways in which we as active members of the Canadian Fisheries Association may proclaim either in private or in public our "wishes or intentions."

It may not be out of place at this point to remind you as business men that conditions for public announcement in our time are "easy" as compared to the time our grandfathers lived.

As recently as 1847 on advertisements appearing in newspapers printed in England, Scotland or Ireland, the state collected duty which amounted to no inconsiderable sum. We are told, however, that as no duty existed on advertisements in the United States, the American newspapers received a larger number of advertisements.



I KNOW that we are all agreed that many business have been created by judicious and persistent advertising. In fact, many articles, even some of doubtful necessity, have become as "household words" simply through the persistent publicity afforded by out-door signs, etc.

If advertising has been so good for others, surely it should be the very best help to the Fish business,—a business engaged in catering to the positive needs of the community.

If publicity never did a "good thing" any harm, surely the more advertising we can give the Fish business the bigger and better it will become.

It seems to me, however, looking at the business from the Retailers standpoint that at the present time with such abnormal demands for Fish of all staple lines, that "production" and more production is required. At the Annual Meeting of the Bank of Commerce held recently the President said "nor can we afford to see the valuable fishing industry of British Columbia, which furnishes 40 per cent of our Fish, decline on account of the unskilled methods employed in both the Salmon and Halibut fisheries."

The demand for Fish has now been created and we all believe, I am sure, that there will be no difficulty in disposing of all the Fish which can be caught. There are several varieties such as Pollock, Hake, Cusk, Dogfish, Skate, etc. which do not meet with a ready sale in this country and we as members of the Canadian Fisheries Association, interested in supplying the people of Canada with good food at a reasonable price might "do our bit" to reduce living expenses by giving publicity to the good eating and highly nutritious qualities of these Fish which have almost been a waste product to the present time.

I fear I have been digressing with my subject but to return to my topic:—



SPEAKING in Montreal recently a gentleman said "properly speaking there are two classes of advertising, **general** and **direct**." Announcements in street cars, newspapers, or on bill boards, come under the heading of "General" advertising; "Direct" advertising being more of a personal call.

Advertisements either "general" or "direct" may be simply reminders or they may be educative. Bill boards for instance with the simple words "Gorton's Cod Fish" as seen throughout the state of Massachusetts would be simply a reminder and would mean nothing to those who had never made use of or handled the product referred to, but to those who have had Fish Cakes or Creamed Cod Fish, made from "Gorton's Codfish" a sign such as mentioned would act as a reminder to make a purchase of superlatively good Salt Cod at the very first opportunity.

To be worth advertising, Fish and Fish products must have real merit and it is only by guaranteeing the goods we advertise we can hope to create a further demand. We should be careful to advertise seasonable varieties and at reasonable prices, for even yet there is among many of our people an antipathy to Fish in any form.

Unfortunately for the Retailer, although the same sympathy may not be due to the "producer" the cost price of many varieties of Fish, including particularly Smoked Fish, has risen to such an extent that the consumer blames the retail Fish dealer for the continual rise in prices. However, I am satisfied that all Retail Fish dealers are prepared to continue to supply the public as reasonably as possible.

In the past, I fear, the Fish dealers have not been as liberal in their advertising appropriations as the nature of the business with its vast possibilities would suggest. True, some firms make a practice of issuing in mid-winter a calendar, not infrequently a picture of a female, who would be subject to pneumonia and other diseases if in real life.

Even our own Fisheries Department at Ottawa issue the monthly Fishing Reports "under the authority of the Naval Service." We all admit the value of the Naval Service but I feel the omission to make greater use of the word **Fisheries** is an oversight, which naturally gives the fishing industry no publicity.



THE officials of our Fisheries Department might well take a lesson from the United States where men are sufficiently interested in the development of the Fish business to give great publicity to the food value of Tile Fish for instance; and thus help to create a demand for a fish which has latterly been in great supply and which has been sold at a very low price.

We in Canada as before mentioned have fish which could make excellent food at a very low price if the public was educated to the food value of Pollock, Black Cod, Skate, Cusk, etc.

Publicity along these lines would be "educative".

One point I wish to urge and urge very strongly. Let us all as Fish Dealers recognize no Fast Days but push the sale of Fish on Tuesdays and Fridays and any other meetless days, as **FISH DAYS**.

Let us all resolve to spell **FISH** always with a capital **F**.

There are many methods by which Fish may be given publicity.

In the writer's home city in the "Old Country", some years ago, when a barrel of Fresh Herrings or Mackerel was received by the local Fish dealers it was the custom to have the Town-crier or Bellman (a man of great age) make the round of the city, and at certain places, usually intersections of streets, ring his bell the usual-number of times, then announce in deliberate voice that "so & so" had received a barrel of Fresh Herrings, &c, which would be sold in the market place at such a time and price. While this method would now be out of date is served its purpose then, when a weekly newspaper was the only other available advertising medium.

For **educational** advertising there are many suggestions. In the news of the day recently I read that the Ontario Department of Agriculture and the Grand Trunk Railway are co-operating in a campaign for "Better Farming" by fitting out a demonstration train to tour Western Ontario.



COULD not our own Dominion Fisheries Department also co-operate to the extent of using similar means to educate the public as to the value of our Fisheries. Another method by which many might receive information regarding the economic value of Fish as a food is through the medium of the many Peoples Forums throughout the Dominion.

The Canadian Fisheries Association has members in practically every centre of population. Why not encourage these members to give addresses, preferably illustrated. This has already been done on several occasions with great interest. A campaign might be carried on through the agency of the many Domestic Science Classes if the school authorities were approached in the matter and I venture to think that the young might be interested in having those qualified giving a simple talk to the juniors, telling them of the vastness of our Fishing resources.

In this connection I refer to an item in the last issue of the "Canadian Fisherman." It reads "H. R. Silver, Fish Merchant of Halifax, addressed a meeting in the school-room at Riverport, Thursday evening on improving methods of curing Fish."

The newspapers and journals are always on the look-out for "copy." Here again the members of the Canadian Fisheries Association might "do their bit" by encouraging the news editors to feature items of interest regarding Fish and seeing that recipes for cooking Fish are continually kept before the public.

By having prominent men connected with the Fishing industry speak at meetings of (say) the Canadian Club, Rotary Club, Lodge meetings, &c. interest would be awakened to the value of Fish.

If a series of suitable pictures, either moving or still, relating to the Fish business could be procured and featured at the Picture Theatres, a vast amount of interest would be aroused.

As a "reminder" to "Eat Fish and more Fish" could not this Association procure small "stickers" by the hundred thousand which might be sold to the several dealers and used on letters, envelopes, and in fact wherever and whenever possible. Up to the present I have made little mention of the general newspaper advertising by the Fish dealers.

To my mind this has been very much neglected in the past.



IT is regrettable that in a city of the size of Montreal, one of the oldest evening papers rarely contains a single Fish announcement, not even on Thursday evening. This may be purely the fault of the advertising department of this particular paper, but now is the time for the newspapers and the Fish dealers, both wholesale and retail, to get together and make up for lost opportunities.

The last method of advertising I will at present mention, consists of circularizing from time to time, and speaking for myself as a retailer, I will state that a bright weekly "bulletin" always receives careful consideration.

In conclusion I trust the foregoing remarks and suggestions may cause some discussion which will result in more and better publicity for our industry, which so far as Canada is concerned, is still in its infancy, but which gives promise of becoming the most important of our great Dominion resources.

HE WAS A DIVER.

A keen temperance advocate was one night addressing a public meeting on his pet subject.

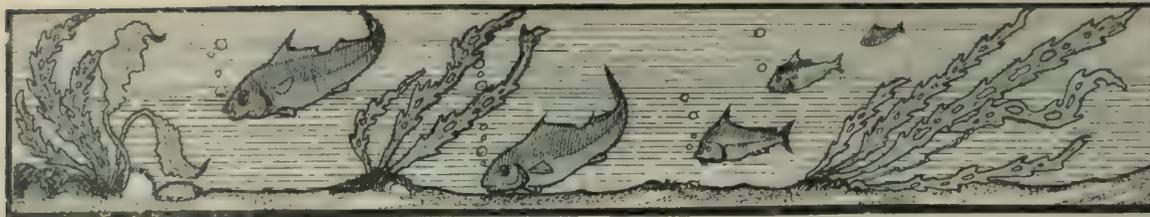
"I should like," he declared, "to take every bottle of wine and every bottle of spirits and sink them all to the bottom of the sea."

A man at the back of the hall jumped up excitedly, shouting, "Hear, hear! Hear, hear! Hear hear!"

The lecturer paused in his remarks to beam delighted approval, on the interrupter. "Ah, my friend," he said "I can see that you are a teetotaler!"

"No, sir; I'm a diver!" said the man.

Hon. J. D. Hazen, Minister of Marine & Fisheries, will accompany Premier Borden to England for the Imperial Conference,



Fish Talk from Lunenburg

Fish, Fishermen, Fish Cookery, Notes and Comment

By AGNES G. McGUIRE.



THE year just closed, is, for the Lunenburg Fishing industry at least, the most remarkable in the history of the town.

Remarkable, because of the unprecedented prices for fish, rather than the bigness of the catch. On one vessel the crew shared \$733.00 and on another \$725.00 per man, for about five month's work on the Banks. And as soon as they returned from the fishing trip, every schooner that wanted a cargo charter could obtain one, resulting in about 77 vessels engaging in that trade, chiefly to European ports, thus adding very considerably to their sums earned during the summer. In fact, no year has ever shown such a goodly balance on the credit side for our fishermen as that of 1916.

In the spring of 1915, when \$5.75 was offered as a starter for dry cod, and later \$6.00, \$6.50, \$7.00 and \$7.50, the knowing ones predicted that the top notch was struck in fish prices, and the bell was about due to ring, but when the spring of 1916, showed a starting price of \$7.10 no one evinced surprise when the \$8.00 mark was struck and the last cargoes brought \$8.05 in Lunenburg, and the price continued to soar until \$8.50 was offered at Halifax, but by this time the catch was practically all sold.

The demand far exceeded the supply and demonstrated clearly the fact that the catch of a fleet of 400 schooners could readily have been marketed, instead of that of the 106 that were engaged in this most important industry.

Fisheries Most Important Industry.



AND it is most important, I may be pardoned if I claim that it is the most important industry of the world.

Does anyone take exception to that statement? If so, I shall try to prove the truth of my assertion.

The fishing industry, from the point of economic values, is worth infinitely more than any of our other resources, because the supply is practically inexhaustible. Take for example our forests, on which our great lumbering industry is dependent. Year after year of constant taking away eventually spells depletion.

It is so also with our mines, and even in a measure with our agriculture.

With the fisherman, however, the bigger the demand, the bigger the yield.

The cost of equipment also, is not nearly so great as in many industries, those for instance, in which expensive machinery and costly engineering are neces-

sary for their development and then, again floods, frost nor drouth affect the fishing industry as they do agriculture.

In the latter industry, the land if not properly attended to, runs out, and rotation of crops and other technical features are necessary, but the fisherman has no rotation to bother him on the fishing grounds.

The waters swarmed with fish in 1916 as they did in 1915, and as they in all probability will in 1917 and until the end of time, as far as the natural course of events is concerned.

And that is after all the really big point that counts, this natural inexhaustible supply without artificial stimulus of any sort.

It is not enough to say that money and good money was earned in 1916. It is the assurance—always of course considering regular and natural occurrences, that good money can be earned in 1917 and the years to come, that really counts.

The fishing industry therefore is the dependable industry, because just as surely as you put your labor into it, you will get your dividends.

How many miners can say as much? How many have experimented a lucky find of gold or silver or other metals, and after vast labor and huge expenditure for equipment, that the lead has petered out, and spelt flat failure.

How many wheat or fruit farmers, have slaved over the planting or spraying of their crops, to find that a sudden frost or long drouth has crippled their harvests and their work has been in vain.

But it is not so with the Bank fishermen. They put in a season's hard work, and they draw their good money for it and as far as the elements are concerned, they've got to go some, to daunt a Bank fisherman.

The knowledge of the assured future of those already employed, and that more men and still more men can enter the field and not overcrowd it, there being plenty for all, surely proves the truth of my claims that this is the most important industry of the world. It is an incontrovertible fact.

Lunenburg Catch a Record.



THE catch of the Lunenburg County vessels for the season of 1916, totalled some 219,360 qtls.; this was less than in 1915, the total for that year being 227,245 qtls.

Captain Abraham Cook, again won the distinction of being high liner of the fleet, having weighed off exactly 4,100 qtls. of fish.

No one could wear his laurels more modestly, than

this quiet spoken easy mannered skipper, who simply doesn't want to hear anything about that end of it, at all.

However, figures speak for themselves. There is no particular need for loud talk, when the dividends are paid on 4,100 quintals of fish at the figure they brought last year.

The Lunenburg Bankers generally, are very loth to speak of their success.

They have done exceptionally well this year, they know it themselves and are not at all particular whether anyone else knows it or not.

This attitude is rather incomprehensible to the average outsider, as the usual thing is to splurge a bit and make a noise about success; but if you associate with the Lunenburg men, you will find they have a horror of publicity, and from that you cannot budge them.

I remember a rather sad experience I underwent a couple of years ago.

About that time, The Gloucester Times was running a series of stories of the successful fishing captains of that port. Each day their pictures appeared and a lot of interesting reading about their experiences etc, was published, and the manager of one of the Halifax dailies thought this would be an admirable feature for their readers.

Accordingly I was deputized to interview our captains, get their photos and send in a story each day.

Did I succeed? My impressions were that if I had needed money, I'd have got it quick. Had I wanted a meal or assistance from a pecuniary stand point of any sort, it would have been forth coming, but the story of their lives: Nothing doing.

I pleaded, exhorted, argued, told them I'd write absolutely nothing but the truth, and only such truth as was more or less public knowledge, but they were adamant, to a man.

I am perfectly positive that I haven't convinced the manager of that daily yet, of my need of failure, but I wish he'd make the experiment himself, then he'd know.

It is hard to explain, there's no reason for it, and from my purely personal point of view, not much sense in it, but even their wives can't make them see otherwise and as Mr. Dooley would say: 'There ye a-r-r-r-e!

Fishermen and Writers.



THE Editor of the Canadian Fisherman in his latest work, "The Shack Locker", pays many warm tributes to the class of men engaged in the Fishing Industry. He speaks of them as a clean lived decent, honest lot of men, whose every thought is for the comfort and welfare of those at home. Indeed it would be hard to find a better brand of husbands and fathers, sons or sweethearts than these toilers of the deep, whose avocation separates them from those they hold dear for seven or eight months of every year.

Thank Heaven, he is one writer at least who does not sicken us with the eternal twaddle about "types", as if the average fishermen were something that should be exhibited in a side show, with a brass band accompaniment.

I don't know of anything more irritating and a normal human being, than to have some penny-a-liner, suffering badly from an attack of "cacoethes scribendi" invade a town, and after hanging around for a couple of hours, go away to juggle with a bunch of

words, he fondly calls a story, telling all about the "types" he has found in the men engaged in the fishing industry.

For such an one, the life of the average fisherman or his affairs, would have about as much privacy as a gold fish.

These "type" hunters are regular Christopher Columbuses. You never can tell where they are going to discover new ground, and the amazing part of it all is, that they usually tell the inhabitants of the town they have paid their addresses to, a huge amount of things, they never knew about themselves before.

For instance, one evening several summers ago, while on a lecturing trip I found a magazine in a country hotel, and as I idly turned the pages the name, Lunenburg, caught my eye. On giving my attention to the story, I found that two persons had travelled through Nova Scotia and had collaborated on their impressions with astonishing results.

Pumpkin Soup.



TO my huge amusement, I learned that "Pumpkin Soup", was the national dish so to speak of Lunenburg County. Pumpkin Soup'. Ye Gods!! I have been in every nook and corner of this fair county, where manual occupations are followed, but never have I heard of, much less seen, pumpkin soup as an article of diet.

I have eaten as fine pumpkin pies as in any part of the New England pie belt and have seen a surplus lot of the luscious yellow globes, sliced up for the cattle or even boiled in the big out door cooking pots as food for young pigs, but that about covered the pumpkin uses. Yet non-residents of Lunenburg County who have read that article know all about us.

Haven't they the printed w-u-r-r-d that we eat pumpkin soup on all occasions?

When you begin to talk of the "eats" of Lunenburg, and come to the fish part of the menu, I am more than ready to listen.

Fish as Food.



HOW often one hears persons of apparently sound judgment declare, that they just hate fish", positively loathe it!"

It took me a long time to arrive at the solution of that problem, but I have at last decided, that it is because many of them never ate decently cooked fish in their lives.

When I speak of fish, I do not mean the cold storage product, which has been out of its native element so long, that it is suffering from home sickness and tastes accordingly.

Neither do I mean salt codfish that has been cut in hunks and put on to boil for hours, until it is as hard as the nether millstone.

I have had the misfortune to have had both of these atrocities set before me and on those occasions, I didn't like fish either.

In Lunenburg County, they know all that is to know about cooking salt codfish.

How To Cook Salt Codfish.



IT is first soaked over night, to freshen it, then it is put on to boil in fresh water and as it reaches boiling point it is moved to the back of the range to keep at just that point, and when it is served it is deliciously tender and sweet and almost fit to eat without any accompaniment, but if

is usually dished with a sauce boat of golden brown onions, fried in hot pork fat with the tiny pork scrap cooked to a perfection of crispness.

There is a favorite dish here known as salt cod, "Dutch style," which I have never eaten outside of Lunenburg County, and among codfish dishes, it has no peer. To prepare, the dry fish is picked into tiny bits and this time is allowed to boil; the water is changed once or twice to freshen it properly; then an equal quantity of potato, pared and cut into eights, is turned into the pot and fish and potatoes are allowed to cook until the potatoes are done.

The pork scraps and onions are fried together as in the foregoing directions, then the fish and potatoes are dished in a deep dish and the smoking hot fat and onions are poured over the whole. For those who do not like pork fat, butter may be substituted, and for those who need a substantial, appetizing dish, this preparation has no equal.

I make no excuses for the free use of onions, my-lady-delicate-and-supercilious to the contrary, notwithstanding.

I saw an excellent article recently in a woman's magazine, entitled "Onions without any apology."

Nearly everyone really likes onions, if they will confess the weakness, and the general health of all races, who include onions largely in their diet is far superior to those who have foolish prejudices on the subject.

Some Good Recipes.



I MUST tell you of one way to prepare dry cod which I have never seen outside of my own home, and is my favorite method of all.

It is an equally good breakfast, luncheon or supper dish.

To prepare, pick up the fish and freshen as previously described; drain and place on a platter and sprinkle thickly with dry mustard and coarsely ground black pepper. Pour over the fish a few spoonfuls of hot water and dot generously with bits of fresh butter. Place in the oven until butter is melted and serve with baked potatoes, scalloped tomatoes or stewed tomatoes with red peppers, and carrots santed in butter.

After eating this dish, there will be very few of the other forms of preparation found popular, as its piquant flavor, from the mustard and the hot tomato accompaniment, make it particularly pleasing to the palate, and quite out of the ordinary. In fact, it tastes more like an Italian or Spanish dish than anything else.

The Lunenburg fishing captains say that the cooks in Porto Rico, disguise the taste of codfish, so that you would never know what you are eating.

Curry, of course, is the principal agent of disguise, and personally, as I abhor curry, the dish would be ruined for me.

That favorite condiment of tropical countries, smells to me, like condition powders, and I would have a sensation that I ought to be hitched to a manger if I had food seasoned with it, placed before me.

I do not wish codfish to masquerade so effectually that its identity is indiscernible. I knew a man from Virginia once, whose favorite dish was picked up cod in cream, he could never get enough of it, and he was brought up in the land of fried chicken and corn pone,



I WONDER how many of the Canadian Fishermen's readers have eaten pickled cod's tongues and sounds or that wonderfully delectable article, fresh cod's tongues, fried in butter.

Brought up in a town where fish were as everyday matter as the water that nearly surrounded me, it astonished me to learn that many kinds of fish which I had hitherto regarded with a more or less unfriendly attitude, figured on the bills of fare in American cafes at exorbitant prices, and as we all, more or less fall for food that is high priced, I tasted my first cods' tongues in butter, in New York, and wondered why I had never seen such a perfectly splendid dish served at home.

I think that Nova Scotians generally are extremely wasteful in regard to fish as a food, there being scores of varieties that are never even looked at. Fish that are perfectly good and palatable at that.

In the United States, due perhaps to the tastes of the foreign population, I have seen dozens of kinds of fish eagerly sought after, which our people throw away, or perhaps cook for food for the pigs.

Flat fish, flounders, chicken halibut are all dearly paid for in American cities, but little used in Nova Scotia.

Perch, which I have never seen eaten here, are a regular article of food in Boston and New York, and another tid-bit I saw exposed for sale in an American fish market is, herring spawn.

I had the curiosity to question the dealer as to its use, explaining that I thought it was food for cats. The dealer who was an Italian, was horrified at my suggestion, and assured me they were "ver' n-i-i-c-e."

The grayfish, our old friend the dogfish in society, is I believe finding much favor as food.

How to Make a Real Fish Chowder.



PASSING from salt to fresh fish, how many of the Canadian Fishermen readers ever ate a genuine fish chowder?

Here is the method employed by a famous Coney Island chef, and believe me, no one need improve on it.

Last summer I was camping with some friends on an island, where we could get a supply of up-to-the-minute fish. We were visited one day by a number of guests from Canadian inland towns, whose chief desire was to taste a genuine fish chowder. In fact, they came prepared with haddock, bacon and milk, which they wished converted into the chowder of their dreams, regarding which their ideas were very vague.

I was pointed out as the boss chowder maker, but promptly shied at the bacon and milk, telling them gently but firmly, that if I was to make the chowder, it had to be my way.

When they asked what was necessary and I told them, fat salt pork, onions, brown flour, potatoes and water, one of the ladies wrinkled up her nose and said the combination didn't sound attractive. She was sort of wedded to that "bits of bacon and milk" idea, but the majority clamored for my product and I proceeded thuswise.

First the haddock was skinned, a very easy operation, if it is done swiftly. Cut off the head and with a sharp knife loosen the skin around the neck, then give a smart pull, and off comes the skin in a single strip, repeat the operation on the other side. The fins must be removed and the sound scraped and the back-

bone thoroughly washed. The pork was then scrapped fine, and the onions were cut rather fine to brown in the fat. In the meantime a cup of white flour was evenly browned in a spider. Six or seven potatoes were peeled and cut in eighths and the haddock was cut into medium sized pieces, the small bones being removed, but the back bone, with whatever ragged bits of fish adhered to it was thrown in the pot to extract all the nutriment and later it was skimmed out whole, and as white as ivory.

Then being ready to proceed with the real business of chowder making, a layer of potatoes was put in the fat; then the haddock sprinkled with pepper, salt and browned flour, then another layer of potatoes, etc., until all were used, then the pot was filled with boiling water, not milk remember, and the whole was allowed to boil from an hour to an hour and a half.

Just before serving were added biscuits, a couple of pilots, broken rather coarsely, if the old time "hard tack" can be procured, that is the proper thing to use to make the best chowder ever, but as a rule, pilot biscuit have to be substituted.

Two teaspoons of tobacco sauce were then thrown in and three hard boiled eggs cut in slices, but that is only used in a chowder de luxe, it is just as good without.

It was then served piping hot with crisp crackers, and the lady who "did not like the combination," passed her plate for a third helping, which speaks for itself. They all simply raved over it, and without any doubt there is no chowder to equal it. It is an ideal chowder party recipe for men as there is no milk to bother with and the ingredients are easy to carry, and no one could fail with it.

Baked cod, haddock or halibut, with a highly seasoned bread dressing and crisp curls of fat pork or bacon, is equal to any turkey at about one-tenth of the cost.

There is no need for people to consider themselves martyrs, because they are urged to eat fish to cut down the sinfully high prices of meat and the increased cost of living generally.

Fish cooked properly and seasoned tastily is just as palatable, equally nutritious and generally as good if not better food, than beef or poultry.

Of course salt cod, served with some sort of a horrible flour-pastry concoction masquerading as "cream sauce," deserves the black eye it usually gets.

The food is good enough to start with, but fully exemplifies the old adage that "The Lord sends the food and the devil sends the cooks."



NO single article of diet requires to be as well and carefully cooked as fish, so those who have put the ban on this food take heart of grace, and see if the fault does not lie elsewhere than in the fish itself.

Since the war has started there have been some fearful and wonderful fish combinations put up.

In Germany "fish sausage" and "fish butter" have been put on the market, and recently in The Fishing Gazette, I saw a recipe for "Halibut Rabbit," a long way after Welsh rabbit or rarebit. Halibut rabbit, Digby chickens, Bombay ducks, fish cocktails! Really foreigners must think the English language has gone crazy, the whole business sounds like the lingo in Alice of Wonderland.

But, I am a long way from my original moutons.

To resume, likewise to begin, as the old man said at a political meeting.

The Lunenburg Fleet.



THE number of vessels employed in fishing was not as large this year as last; there being about twelve less, which may be accounted for chiefly by the great demand for tonnage in freight carrying.

Then there was the loss of the fine new schooner, the "Lucile J. Schnare", sunk when coming out to Newfoundland on her first baiting, by the steamer "Wartenfels".

The "Emily Selig" had to abandon her trip owing to illness among the crew, and the "Minnie Mosher" had to land five sick men.

The loss of life also was unfortunately greater than last year, five men being swept overboard from the "Leta J. Schwartz", when on the home ward trip; and two being drowned at LaHave, from overloading the dory. One man was also drowned when the "Lucile Schnare" sank.

The Fishermen's Benefit Association, a purely local organization had eight claims against it this year.

This society, for the protection of the families of the fishermen, should have the patronage of all the fishermen, but out of the 2,700 men engaged in this hazardous occupation only about 1,400 have joined.

The fees are very small, each man being assessed one dollar, each captain two dollars and each vessel ten dollars, and considering the benefit it is to an unprotected family it is hard to understand why every fisherman does not support it.

Although the fishermen have done wonderfully well this year, it must not be supposed that the whole trip means clear gain.

In the fishing industry, as in every other, prices have advanced at a hair raising rate.

The cost of hulls and spars is fully 20% in advance of last year's figures.

A schooner that could be built for \$7,000 last year costs \$8,500 or \$9,000, this year. Sails cost about \$250 more than formerly; chain and galvanized rope are about treble in price. Rope has jumped so that a good hawser runs from \$900 to \$1,100.

The "Grub" bill for a Lunenburg banker, the best outfitted vessel in the world from that standpoint, amounts to about \$2,500. Salt costs about \$850.

Should the schooner run into a spring blizzard and lose her hawser and dories there will be hundreds deducted from her dividends.

Then there are the bait bills. Some captains jig their own squid for bait and their bills will be perhaps \$300. One hand liner on Bank Quero used no bait last year; others have bait bills, running from \$1,100 to \$1,800.

Sometimes persons wonder why the crew of one vessel shares so much more, than the crew of another, with the same catch, but the foregoing reasons explain the matter.

Fishermen are Doing Their Bit.



DURING the past year or so, there have been many fishermen enlist for overseas service.

While the patriotic spirit of these men must be recognized, yet very serious situations would arise should these enlistments continue.

Men and men of good physique and courage, are alone able to engage in this calling. It is no work for

weaklings nor can women carry it on. And fish is today so important a food in the army and navy, that men must be left to carry on this industry.

Thoughtless persons, who air their opinions to the effect that "fishermen should enlist" must consider this question more carefully.

Meat being practically prohibitive in price and through scarcity, fish must supply its place as the food of the nation.

It is well understood that this breed of manly men are ready and willing to do their bit but THEIR BIT may consist of procuring food for those at the front and is every bit as important as that of shouldering a rifle.

The calls from the various patriotic funds find our fishermen ready to share their hard earned money with those who are in need.

The amount contributed by the shipowners of Lunenburg County to the British Sailors' Relief Fund in December last was \$6,322 of this amount \$5,050 was given by the owners of fishing vessels and \$1,275 by the owners of the freighting vessels.

In September last was inaugurated Lunenburg Fishermen's Day, which will be an annual institution to celebrate the prosperity of Lunenburg County.

Some 5,000 persons visited the town and a general gala day was observed.

Addresses were made by Hon. A. K. Maclean, M. P.; Dugald Stewart, M. P. P.; J. J. Kinley, M. P. P.; all relative to the fishing industry. Mayor Duff who is also manager of the Lunenburg Fish Company, presided.

It is hoped that next year, the fishermen of the Western Counties will join in the celebration.



SOME TIME since, there was an article going the rounds of the press, containing the statement that nothing but inferior fish is sent from Lunenburg to Porto Rico.

I am prepared to give that statement an unqualified denial. It is absolutely untrue. The very finest fish of this County are shipped there, and the oldest Lunenburg firm that of Messrs. Zwicker and Company have been shipping to that market for over fifty years.

This grade of fish, shipped in sailing vessels only, is so highly thought of by Porto Rico buyers that they often wait a week or more for the arrival of this firm's vessels to secure their stock.

No doubt there is some bad fish shipped out from this port. If a cargo of fish arrives in poor condition, it is thrown on the hands of the shippers.

There have been about fifteen new vessels added to the fleet and the ship yards all over Nova Scotia are crowded with orders.

Smith and Rhuland here, refused to take more contracts until some of those already ordered were completed.

Among the highest catches of the year were the schooners:

J. Burton Cook, Cook	4,100
Delawana, Cook	3,800
F. M. Lozo, Corkum	3,350
Lilian B. Corkum, Corkum	3,270
W. T. White, Knock	3,300
Frances W. Smith, Mossman	3,150
Elsie M. Hart, Corkum	3,000

Many of the other schooners had good sized catches and even for those whose number of quintals was not so large there was the big price to help out, so that 1916 may be regarded as the best year financially that the fishermen have ever experienced.

TRADE OPPORTUNITIES.

We learn upon good opportunity that the French Government will be placing a large order for canned fish in Canada. Only cheap grades will be called for—cusk, hake, pollock, cod, herring, etc., and the probabilities are that they will have to be packed in 1 lb. talls. Tenders will be called for through the War Purchasing Commission, Ottawa, and any cheap fish that can be canned will be considered.

The following articles are called for through the Department of Trade and Commerce, Ottawa. Quote reference number when enquiring for particulars.

464. **Salmon.**—A Canadian firm with canned salmon for export in the future is asked to communicate with a firm in Cardiff.

521. **Salmon.**—The importation of canned salmon, not pale, from Canada, is desired by a firm in Swansea.

532. **Sardines.**—A Swansea firm desires to be put in touch with a Canadian concern able to supply sardines to South Wales.

533. **Lobsters.**—If any Canadian firm has lobsters for export, correspondence is desired by a firm in Swansea.

537. **Fish, tinned and frozen.**—Some Glasgow fish salesmen are desirous of acting as agents (for Europe and South Africa) for British Columbia packers of canned and frozen fish. References supplied.

TO SOUND GRAND BANK.

The coast guard Seneca, now at New York, will leave Feb. 12 for Grand Bank on ice patrol duty, taking with her a party of United States scientists, who will investigate ocean hydrography and sea life. Soundings will be made over the Grand Banks. The Seneca will utilize Halifax as a base until July 1, after which date she will carry on the ocean hydrography work on a line between St. John's, and the Greenland coast, inclusive of the coast of Labrador and waters of Hudson Bay. The work will be carried as far north as ice conditions permit.

PERSONALS.

Lieut. J. W. Nicholls, formerly of the Canadian Fish & Cold Storage Company, Ltd., Prince Rupert, and attached to a B. C. battalion, has returned to Canada on leave and proceeded to Prince Rupert. Lieut. Nicholls was through all the recent fighting at Regina Trench, Courcellette and Moquet Farm, and had an interesting tale to tell of his eight month's service on the firing line. Mr. Nicholls was in Montreal recently on his way west.

Mr. J. B. White of the Conservation Commission; Mr. W. A. Found, Superintendent of Fisheries; Mr. J. B. Fielding, F.Z.S.; Dr. Huntsman, of the Biological Dept., Toronto University, and Mr. F. W. Wallace, Secy-Treas., Canadian Fisheries Association, attended the Convention of the Lake Erie Fishermen's Association at St. Thomas, Ont., on Feb. 7th and 8th.

"The Pacific Halibut War" an Attack and Counter-Attack

Positions of Vancouver and Prince Rupert in Halibut Trade Outlined.

The following interesting article is reprinted from the Vancouver Province and should be of interest to all engaged in our Fisheries.



"PART of the credit for the present situation in the Pacific coast halibut trade is due to the activity of the port of Prince Rupert in trying to secure shipments east through that port, making it the northern centre of the industry; part of the credit is also due to the fact that there are four ports now competing for the catch instead of one, as in the early days of halibut fishing on the northern banks; it is also partly due to changed conditions in demand for foodstuffs, largely occasioned by the European war, and finally in no small measure to the increased prices of all food commodities and of all prices generally."

That, in brief is the answer of men well versed in the intricacies of that very intricate subject, the halibut controversy on the Pacific coast, which forms the subject of a three section editorial entitled "The Halibut War," in the December number of the *Sunset Magazine*. According to further statements of some of these fishery operators the article in question bristles with inaccuracies and misinformation, while a thinly-veiled effort to work up resentment against the Canadian Government runs through it as well.

One of the charges in the *Sunset* article referred to is that "removal of the American duty on fish had failed to cut the cost of fish on the Pacific coast." Answering this, a well known operator said to *The Province*:

Since U. S. Duty Removed.



"THE extra Canadian tonnage of fish going into the American market since the removal of the duty must have held down the cost; for if that extra tonnage had not gone there, the supply would have been still smaller, and the prices consequently higher. As to the complaint in this magazine article, that 'when Canada barred American fish from Canadian markets by a high protective duty, the American market was thrown wide open to Canadian fish,' it is only necessary to point out that the removal of the duty by the American Government was a matter of policy on the part of the Democratic administration of President Wilson, the platform of that party being to admit foodstuffs to the United States free of duty. The Canadian Government had no control over that matter, and so far as their own tariff is concerned there has been no change. It has remained as it is for many years.

"As to the closing of the Canadian market to American fish," continued *The Province's* informant, "the fact is the Canadian market was closed under powers contained in the treaty of 1818 between Great Britain and the United States in respect to Newfoundland fisheries. American fishing vessels were permitted to use the ports of the British colonies for three things only, viz., wood, water and necessary repairs. Under the terms of this treaty no further privilege to American fishing vessels in Canadian ports were allowed.

"By order-in-council, the Dominion Government has modified these restrictions to the extent of permitting American fishing vessels to land their catches at a Canadian port for transshipment, in bond, and under customs supervision, to United States points. No fish delivered by American fishing vessels to a Canadian port can be landed in Canada for Canadian consumption, even when duty of 1 cent per pound and 7½ per cent ad valorem war tax is proffered. Fish caught by an American fishing vessel can be landed in Canada on payment of the duty and war tax as above, provided same is received at a Canadian port by any means of transportation or conveyance other than from an American fishing vessel direct.

Setting "The Sunset" Right.



"IN other words, an American fishing vessel may deliver her catch to Seattle or to Ketchikan, Alaska, and provided the same is shipped to a Canadian port by rail, by common carrier, or by any vessel other than an American vessel engaged exclusively in fishing, the fish may enter Canada for Canadian consumption upon payment of the above tariff charges.

"For the benefit of the editor of the *Sunset Magazine*," said the fishery man, "it is worth while setting him right on the point of competition at Prince Rupert, which arose after the fishing fleet ceased taking its catch to Seattle, I might tell him, as one who is deeply interested in the Prince Rupert market, that the competition is not strangled, as the article asserts. On the contrary, it still continues in most lively form. As to the forcing up of the price of halibut the situation is this:

"The average price paid for halibut at Prince Rupert to American fishing vessels during 1915-16 as compared with prices paid to the very same fishing vessels at Seattle during the previous year, before the fleet went north to stay, is just about double. The question is, whether the wage-earners, the producers, are to be considered or the three or four fishing companies and the supply houses of Seattle.

"That the fishermen are not kicking at getting better prices may be seen from the fact that all the individual American fishing vessel owners at Ketchikan, who sell their catches at Prince Rupert, signed a petition to be sent to Washington, D. C., to protest against what is known as the Strong Bill, a measure which would have been law had it not been vetoed by the President, and which would have prohibited the shipment of fish caught by American vessels in bond through Canada.

If Bill Had Become Law.



INCIDENTALLY, this bill, if passed, would have opened the door for retaliatory action on the part of the Canadian Government, and that is something which the fishing interests of New England and the North Atlantic States can not risk having happen. for their prosperity is bound up in a continuance of long-established fishing privi-

leges extended by Canada. Consider the older and larger fishing interests of the Atlantic Coast States in comparison with those of Puget Sound. Is it not worth while stopping to reflect on the possible jeopardizing of those eastern fishing concerns by some hasty action which might provoke the Ottawa authorities? That is the question of the fishing interests south of the line must ask themselves before making any further effort to call in the aid of Washington.

A good deal of misapprehension arises from woeful lack of knowledge respecting the privilege of buying bait in Canada. Under the order-in-council which, by the way, though renewed from year to year, has really been in force for twenty years or more. "Foreigners, or foreign corporations," to quote the exact wording of the order, "bringing fresh fish in vessels registered in the United States of America to any port in British Columbia, shall be permitted to land such fresh fish at such port without payment of duties and tranship the same in bond to any port in the United States, or to sell such fish in bond to such local dealer or dealers as may be properly and duly licensed therefor under the regulations and conditions hereinafter mentioned, which dealer or dealers shall export the same in compliance with the bonding requirements (but without the right, however, in either instance, to sell in Canada for consumption therein or otherwise, except in bond, any of such fresh fish so landed.

"And such foreigners and foreign corporations bringing fresh fish in vessels registered in the United States of America to any port in British Columbia, shall be permitted to purchase bait and supplies, and ship crews for such vessels at any port in the said Province of British Columbia, provided also that such foreigners and foreign corporations before bringing fresh fish to a port in British Columbia may be permitted to purchase bait at any port in the said province of British Columbia upon an undertaking to the satisfaction of the minister of customs that catches of fish with any baiting so supplied shall be landed at a port on the mainland of British Columbia and be thence forwarded in bond to a port in the United States—the whole under such regulations and conditions as the minister of customs may determine."

Privileges Ottawa Grants.



DISCUSSING this bait privilege, which is restricted as stated, to use for catches shipped in bond through Canada, one man who is in position to speak with some authority

said:

"Not only does the Canadian Government extend this privilege, but a customs officer is sent to any point where a supply of herring for bait is procurable, so that American vessels may enter and clear. If the government facilitates the business of providing bait for foreign vessels; and as herring bait is the one positive essential for a catch; and if the master of a vessel taking such Canadian bait agrees to ship his catch through a Canadian port, is it not perfectly fair and equitable that such an arrangement be carried out? Cargoes of halibut caught with bait procured at an American port can be delivered at any port in Alaska or the State of Washington; or if the owners prefer, they are given the privilege of offering their cargoes for sale at a Canadian port. As mentioned before prices paid at Canadian ports for halibut caught in American bottoms have been over 100 per cent higher than when the market was confined to American ports,

The country is always talking of getting people into the producer class. You can not get them unless it is made an object worth while.

"Here are two statements in the Sunset article which provide their own answer," said one of the men interviewed by The Province. "One is: 'After Prince Rupert became the base of the halibut industry, by virtue of its strategic location'—the other is: 'with a trancontinental railroad close to the northern fishing banks, the situation changed. American vessels having to make a round trip of 1200 miles to Seattle to land their catch and to take on new bait and supplies were under a distinct handicap compared with the Canadian vessels which based their operations on Prince Rupert!'"

An Open Admission.



"THERE is an open admission that geographical not legislative conditions were the chief factor in favor of Prince Rupert. There is no getting away from that 1200-mile round trip between Seattle and the banks. It has been the real cause of shifting the fishing fleet north. Prince Rupert may have made somewhat more capital in print than they had any license to, respecting the shipping in bond privileges, for there was nothing new in that. The privilege had existed for twenty years, and Prince Rupert awoke to its opportunity. 'The elimination of the long round-trip to Seattle,' as the Sunset article puts it, is the prime factor. There is little in the charge against the Canadian Government of subsidizing a cold storage plant at Prince Rupert. That had been a recognized policy long before the halibut trade became disturbed. It was simply availed of by the Canadian Fish & Cold Storage Company, which got a subsidy of something like \$100,000, but its original capital was a million, since increased to two and a half million, so the subsidy is a minor matter.

"There are two or three other misstatements in that Sunset article to which I would like to draw attention. One is that Puget Sound cities started, developed and fostered the halibut business." The other is that the "Canadian Pacific Railway commenced to roar when American firms which had been sending their fish east over its lines no longer could ship their fish by water from Prince Rupert to the Canadian Pacific terminals in Vancouver."

Trade Through Vancouver.



"DEALING with this second point it may be dismissed by saying what every one familiar with the facts of the halibut trade at Vancouver knows full well, that halibut never were shipped by water or any other way from Prince Rupert to Vancouver. There has never been any interruption of the trade done through the port of Vancouver direct by the fishing vessels making it headquarters. Not a pound ever came from Prince Rupert to be sent east over the Canadian Pacific from Vancouver. It is absurd on the face of it, any way, for the damage to the fish in handling and rehandling, to say nothing of the extra cost, would prevent anyone in the business making such shipments."

Regarding the assertion that Puget Sound cities started the halibut business, that can be flatly contradicted. It is to the credit of the New England Fish Company of Boston and Vancouver to have opened up the commercial fishing of halibut in North Pacific waters. When the supply of halibut on the banks of

the eastern coast was exhausted, the New England Fish Company, an old concern organized in 1867, sought new fields. The company came to Vancouver over twenty years ago investigated the halibut fishing banks. After it found the halibut, demonstrated that they could be had in commercial quantities, after exploiting methods of catching the fish and also making suitable arrangements for transporting the fish, from the banks to Vancouver, and thence across continent by the Canadian Pacific Railway, and finally after establishing the markets in the eastern states, the New England Fish Company built up the halibut industry by its enterprise and the development of the trade to Puget Sound ports on the scale afterwards reached was much later. At all times, however, Vancouver had a large proportion of the tonnage of halibut caught and as for the New England Fish Company, it has always had more tonnage to its credit than any other concern in either the United States or Canada.

A Regulation Withdrawn.



ONE regulation complained of by the Sunset Magazine, which has now been withdrawn by the Canadian customs, gave rise to a great deal of petty annoyance and was at no time a real service to the people engaged in the halibut industry. That was when it was sought to have all halibut brought by American vessels to Prince Rupert in bond, shipped exclusively by rail. Where this worked a hardship was in the sorting of the fish. Only medium-sized halibut are suitable for or demanded by the eastern United States markets. Heavy halibut, on the other hand, is a favorite on the San Francisco market, while chicken halibut is a strong local favorite at all Pacific coast points, and, besides, the chicken halibut do not ship well. Hence, when the fish were sorted, the very considerable percentage represented by the large and small sizes became a drug on the market and oftentimes a loss, for there was little use shipping them East. That was, however, soon rearranged. Under present conditions, all fish from American fishing vessels may be shipped in bond by water as well as by rail. The trade is working out on the basis of through freight rates from Prince Rupert to American points on the Pacific coast, the fish being brought to Vancouver for the most part and then transferred to the vessels running to Seattle.

Halibut Fishing Fleets.

Here is a summary of the respective American and British Columbia fleets engaged in the halibut fishing. It will be noted that the old fleet, including all sorts and sizes of vessels, which was formerly plying out of Puget Sound to the northern banks, is not two hundred, as the Sunset Magazine asserts, but less than one hundred.

American Fleet.



FISHING vessels owned by Puget Sound companies engaged in the halibut business:

Booth Fisheries Company—A consolidation of the Chlopeak Fish Company of Seattle, and International Fisheries Company of Tacoma, Wash. Two steamers, 2 schooners.

San Juan Fishing & Packing Company—Two steamers, 1 schooner.

National & Independent Fisheries Co.—This company formerly owned two steamers, both of which have been lost. One schooner. (Within the past

month this company has purchased a second schooner, formerly operated as a part of the Independent fleet.)

Glazier Fisheries Company, Tacoma—One very small schooner.

There are about seventy halibut schooners with gasoline engines, of American registry, that have in the past operated from Puget Sound ports. These vessels are not owned by companies, but by individuals, and are operated on the so-called share basis, and along similar lines to the fleet of vessels which operate out of Eastern United States and Eastern Canadian ports.

British Columbia Fleet.

New England British Company — With its western headquarters at Vancouver, with its subsidiary companies, the Canadian Fishing Company Limited and Atlin Fisheries Limited, operates a fleet of fourteen steamers and schooners, which fleet in itself is larger than the entire fleet of company-owned vessels which are or have been operating from Puget Sound ports.

The B. C. Packers' Association, of Steveston, formerly owned two steamers, which have been lost within the past year.

The Canadian Fish & Cold Storage Company, Limited, of Prince Rupert, operates three British steam trawlers, and four Canadian gasoline schooners.

A fair sized fleet of Canadian gasoline vessels, independently-owned operates from Rupert and Victoria.

CUBAN MARKET CONDITIONS.

The following report of prices ruling at the Havana Produce Exchange for the week ended January 20, 1917, has been furnished by Mr. Enrique R. Margarite, S. en C., 66 San Ignacio street, Havana:—

FISH IN DRUMS.

Importation—

January 15, ss. "Mexico," 31 drums.

January 15, ss. "San José," 232 drums.

The lack of facilities for communication with the interior of the island, due to recent troubles among railroad lines, together with the fact that the most important places for the consumption of fish in drums are located out of this city, affords an accumulation of supplies, and as this is an article of easy deterioration holders have commenced to lower their prices. Codfish sells at 9½, haddock at 9¼ and hake at 7¼ cents per pound.

CODFISH IN CASES.

Importation—

January 15, ss. "Mexico," 100 cases from New York.

January 15, ss. "Atonas," 500 cases from New Orleans.

January 15, ss. "Charlotte," 300 cases from New Orleans.

January 15, ss. "San José," 405 cases from Boston.

January 17, ss. "Saratoga," 685 cases from New York.

January 17, ss. "Tenadorés," 250 cases from New York.

The demand for codfish in cases has been very dull this year, but holders have succeeded in sustaining their prices and quote at \$12 to \$16 per case for that from United States of America and Canada.

HERRINGS.

The market for bloaters remains the same as last week, with the price of \$1.50 per large box in evidence.

Some Neglected Sea-Weed Products and Methods of Utilization

By PROFESSOR EDWARD E. PRINCE, LL.D., D.Sc.,

Dominion Commissioner of Fisheries, Ottawa.

Summaries of valuable researches upon the utilization of sea-weeds, have already appeared in these columns, and the important work carried on in this field by the Biological Board of Canada, has excited widespread interest. The Board authorized Professor A. T. Cameron of the University of Manitoba, four or five years ago, to undertake researches upon our kelp resources, especially those of the immense beds of seaweed on the Pacific Coast. He commenced by investigating the production of iodine and potassium chloride, and announced the startling result that the British Columbia beds could readily produce both these products to an amount not less than three or four million dollars per annum, an amount equal to the annual value of our herring, or cod, or lobster fisheries.

I prepared for the *Canadian Fisherman* a synopsis embodying these amazing results, and this appeared two years ago.

Professor Cameron followed up his first researches by further work in 1914-1915, and his conclusions are contained in two papers published in "Biological Contributions" a volume which formed the scientific appendix to the fifth annual report, of the Department of Naval Service, Ottawa.

It is well known that Japan for a long period has turned to commercial account the sea-weeds, which in Canada are practically wasted. No doubt the value of many common marine algae has been appreciated by farmers, resident along the shores, and they have season after season carted on to their fields great quantities left by the tides, or deposited in masses along the beach after violent storms.

Dr. F. T. Shutt, Dominion Chemist, Ottawa, initiated some interesting experiments with ground-up algae, and his reports must be of unusual interest from an agricultural standpoint, especially if the chemical value of the products can be increased by admixture with powdered fish waste. Apart, however, from the importance of kelp and other marine algae, as fertilizers on the land, or as sources of iodine and potassium chloride, these wasted vegetable products are of very great value for food purposes, for glue and isinglass, for clarifying purposes in breweries, for stiffening textile fabrics, and for many other uses. Japan has found her sea-weed industries so remunerative that they have been much developed, and many years ago the total annual value of the products derived from sea-weed waste, was not less than two or three million dollars per annum, and it is vastly more today.

The chief products yielded by sea-weed in Japan are: first, sea-weed isinglass; second, sea-weed glue; third, sea-weed vegetable foods, many of which are undeniably of an exceedingly delicate and dainty character. It may be interesting to give a brief account of the various sea-weeds used, and the methods of the turning of them to commercial account, as well as indicating the nature of the commercial products which result.

(1)—Vegetable isinglass, which is called "Kanten",

is made from a common shore-weed which forms pale reddish fronds 5 or 6 inches high and 9 or 10-in. broad, and scientifically known as *Gelidium corneum*, (Fig. 1). Other weeds of a similar character are also used, and they are gathered during the whole summer from May till October, but July and August are considered to be the best months. After being gathered, the weeds are spread out on the sea-shore, dried and partly bleached and then sold to the isinglass factories. The leading Japanese factories are at Osaka and Hyogo, and seventy or eighty persons are employed there in the industry; but there are many other smaller factories along the Japanese shores.

The dried, bleached weed is sold to these factories at the rate of 6 to 9 cts. per pound.

There are five stages in the process of treatment in the factory, (a) A thorough washing process in fresh water which removes all the hard particles and foreign material from the dried weed.

(b) Drying and bleaching for about 24 hours upon reed frames; the wet algae after washing being spread out in thin layers.

(c) The dried sheets of weed are rolled up and boiled in kettles, the thick pulp jelly which results being strained through coarse flannel into a tank.

(d) The strained jelly is removed from the tank and placed in linen bags of coarse mesh, and subjected to pressure, so that the further purified mucilage flows into a large vat.

(e) From the vat the jelly is dipped by wooden instrument on to cooling trays which are 2 feet by 1 foot, and 3 inches deep.

(f) After cooling, but before it is hard, the jelly is cut into long bars.

(g) The bars while still soft are squeezed through a grating, so as to form slender sticks 10-in. long, by $1\frac{1}{4}$ to $1\frac{1}{2}$ -in. square.

(h) The sticks are dried and bound in bundles ready for market, the bundles being of about $\frac{1}{2}$ -lb. weight.

USES.—The white, semi-transparent, tasteless, isinglass prepared in the way just described is used for many purposes including, (1) soups; (2) jellies, candies, etc.; (3) clarifying wines, beers, etc.; (4) stiffening silk and textile fabrics; (5) for size purposes in paper manufacture, for moulds for art plaster work, etc.

MARKETS.—The principal markets to which this sea-weed isinglass is shipped are Great Britain, France, Holland, Australia, India and China. (2). Sea-weed glue known as "funori," in Japan.

This valuable product is made chiefly from sea-weeds of the genus *Gloiopeltis*, the species usually being *capillaris* and *coliformis* (Fig. 2). These weeds are gathered on the rocks at all seasons and undergo five processes in order to produce vegetable glue,—(a) The weed is dried. (b) It is sorted, cleaned and soaked in fresh water. (c) Arranged in thin layers on large, shallow trays tightly packed. (d) From the

trays the sheets are turned out on to matting and left to dry and bleach in the open air, and to prevent curling it is found effective to gently sweep the sheets with a damp broom. (e) The thin, flexible sheets are gathered into bundles 5 by 3 feet or into rolls 5 feet high and 6-in. in diameter.

USES.—The principal uses for the glue produced from sea-weeds are, (1) as starch; (2) coating and stiffening paper and thread; (3) glazing and stiffening fabrics; (4) cementing walls and tiles.

weeds are obtained by tearing them from their rocky attachment during the late summer months, July to the end of October, and the fronds are spread on the beach to thoroughly dry and are then tied into long flat bundles for shipment to the factory.

METHOD OF MANUFACTURE.—There are four stages in the process of manufacture, namely: First.—The dried weed is boiled for fifteen or twenty minutes in fresh water and intermixed with a coloured dye, chiefly malachite green.



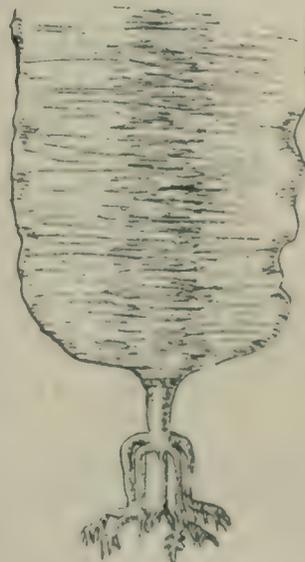
1. $\frac{1}{3}$ natural size



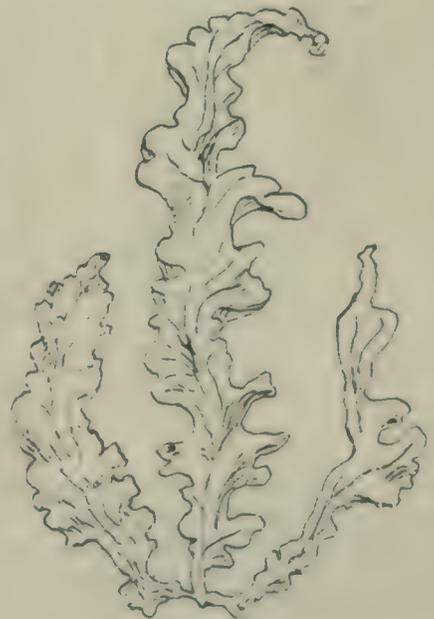
2. about natural size



5. $\frac{1}{2}$ natural size.



3. $\frac{1}{5}$ natural size



4 natural size

MARKETS.—The amount produced annually is mainly used in Japan and the exportation is small. England, France, Russia and China import this material from Japan to the amount of probably two or three thousand dollars per annum.

(3). Sea-weed vegetable products for table use.

These products are widely used in Japan and known as "kombu" and "amanori". The former is mainly produced from the brown *Laminaria* (Fig. 3) of several species, and the second, (Amanori) is made chiefly from a kind of sea-lettuce or soft, whitish weed, belonging to the genus *Porphya* (Fig. 4). These

Second.—The boiled, dyed fronds are spread on straw-mats, and dried in the open air.

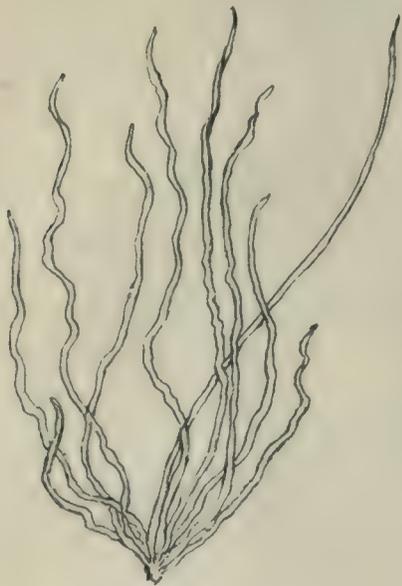
Third.—They are rolled up before they reach the dry, hard condition and after the lapse of a period of time are unrolled and arranged flat in wooden frames piled up over a foot high and tightly compressed and then cut into four equal lengths.

Fourth.—The compressed masses are then shredded lengthwise, and the shreds spread out on mats to dry in the open air. These long, dry, green shreds are marketed and will keep in good condition for a year or more.

USES.—The shredded weed is used either as a vegetable by itself or boiled in soy-bean sauce. Great quantities are used in Japan and China, the total output being over \$5,000 in value. The product is sold very cheaply, the price being 1½¢ per lb. in Japan.

“Amanori,” the second sea-weed vegetable mentioned above, is made in a similar manner by washing in fresh-water and spreading out on small bamboo mats; after being chopped fine. The material in drying forms thin sheets, and these are stripped from the mats and pressed flat in bundles of ten. The sheets are 14-in. by 10-in., brownish purple in colour, and very glossy and as flexible as sheets of paper. The way in which “Amanori” is used is, after being fried to a crisp over a fire, it is crushed and mixed in soups and sauces to impart a flavor, and it is also boiled with soy-bean sauce. A very common use is in making meat- or fish-sandwiches, but there are a great number of other uses for this popular sea-weed product.

Other weeds of less importance are *Ulva*, (Fig. 5), and *Enteromorpha*, (Fig. 6), which are really kinds of



6 natural size.

greenish sea-lettuce. They are dried in thin sheets in the open air, and without any other special preparation are used chiefly as a condiment or as a powder after being gently heated and crushed.

It may be added that the U. S. Fisheries Bureau has realized the extreme value of marine algae and has recently appointed a scientific expert, Dr. N. L. Gardner, of California University, to make a comprehensive survey with the view of more adequately utilizing the sea-weed resources.

All the investigations hitherto carried on upon this continent including the elaborate labours of Dr. F. K. Cameron under the U. S. Department of Agriculture ignored the food-value of sea-weeds. If vast quantities of sea-weeds at present allowed to go to waste can be made to yield delicate, delicious and very nutritious foods, and add to the variety of our table menu, as the Japanese have long demonstrated, the increasing cost and scarcity of domestic foods, may in some small degree perhaps be ameliorated.

PACKING OF GRAYFISH.

An interesting development in the course of the work of the Bureau of Fisheries, Department of Commerce, of introducing grayfish as a food has occurred in the Northwest. A canning concern on Puget Sound is putting up 10,000 cases (480,000 cans) of grayfish of their own motion and at their own risk and expense, using for this purpose the plant and machinery devoted to canning salmon but which at this season of the year is idle. The canners have found that the mechanical apparatus used in canning salmon, which reduces to a minimum hand labor, is applicable to the canning of grayfish.

A supply of grayfish is at that season of the year available on the West coast, lasting until just before the salmon begin to run. The grayfish are not found in the winter on the Atlantic coast, but are present there during the summer. The result of this arrangement is that a winter pack can be made upon the Pacific and a summer pack upon the Atlantic. Specimens of the Pacific product have been submitted to and approved by the Bureau of Fisheries, which will do its best to make the product known.

The demand for grayfish is already far in excess of the present supply, but with the new Pacific product and the resumption of work in the spring upon the Atlantic product, a very much larger pack will be made than has heretofore been possible.

QUEBEC HAS RIGHT IN FISHERIES OVER FEDERAL GOVERNMENT.

Quebec, Feb. 7.—The court of appeal today delivered its decision in the pending cases as to what rights Quebec province possesses on tidal-waters to issue exclusive fisheries permits. The Federal Government claims it has exclusively the right to issue such permits.

The Court decided with Justice Cross alone dissenting, that Quebec province has without contest the right to issue exclusive permits for fisheries in tidal-waters.

The case will be taken by the Federal Government to the privy council.

The court of appeal had to deal with three questions, namely:

1. Has the Government of Quebec or any member of its executive council the right to grant exclusive fisheries rights in whatever manner, in tidal waters anywhere within a three-mile limit from its shores? (A) between the lines of high and low-tide marks? (B) off the mark of the low-tide and in case of an affirmative decision up to what limit?

2. Can the Legislature of Quebec province authorize the Government of said province or a member of its executive council or any other person whatever, to emit the exclusive fisheries rights described in the preceding clause.

3. In case there existed in the past or in the present certain restrictions to the issue of the exclusive fisheries rights as above stated and that said restrictions have been abolished or are to be, would said fisheries in said waters, after said abolition of rights, be the property of the Government of this Quebec province, and has the Legislature or the Government or any member of the executive cabinet the right and power as to these fisheries rights, mentioned in the preceding questions?

The majority of the court i. e., Sir Horace Archambault, the Hon. Lavergne, Trenholme, Carroll have answered in the affirmative. Judge Cross is dissident.

Letters to the Editor

BROTHER "BILLY" GREENWOOD DEFENDS THE BLACK COD.

[In our last issue, we had the temerity to suggest a new name for black cod. Mr. W. H. Greenwood of Vancouver is evidently the "guide, philosopher and friend" of this particular fish and he "goes" for us accordingly. Don't shoot, Billy! Get after the "Pacific Fisherman"—they put the idea into our head.—Editor].

Brother Wallace:

Don't change the name **Black Cod**—so far as British Columbia is concerned, Black Cod is now considered under its own distinctive name, the best food fish got from the Pacific. The public know it as black cod—that is all that matters, even if the representative fish-culturist is peeved because it is not a cod at all. In the minds of consumers who know it is a cod, and the descriptive term **black** attached to it only renders it the more desirable. The general principles that emanate from the minds of our neighbours to the South should be scrutinized with care by us. Unica? Ye gods, why not Eunuch? And then you would have to educate the people all over again, when they are already educated to eat Black Cod. Why so much education? If the public want black cod to eat, for heaven's sake don't start a public school to tell them it is not a cod and is wrongly named. Let them eat it, and give them more of it. Go to . . . with your nomenclature! B. C. Black cod is now and ever will be the best food fish produced in the Pacific, specially if it is smoked.

W. H. GREENWOOD.

Vancouver, January 18, 1917.

CHEAPER ROPE WANTED.

Editor, Canadian Fisherman:

Your article advising that the fishing bounty should be turned into a fund to aid in the purchase of motor-engines for fishing craft in general, recalls the attempt we made about twelve years ago to have that very idea reduced to practice. Our efforts failed, not for the lack of energy, but because the argument we put up was not exactly tenable when confronted with some stubborn facts.

The Fishermen's Union of Nova Scotia was then in vigorous youth, active as well as watchful. Power-boats were just coming into use on the South West shore. Everybody wanted one, but few had the ready means: as at that time a four-horse would cost about \$300, duty and all; for the first machines came from the States, and the tariff was 37½ per cent. At one of its conventions the Union formulated a request that fishing bounty might more profitably be spent in furnishing men with the modern boats. The government did not take kindly to the proposal, and the banking crews fought it tooth and nail. Their allowance was a little more than it is at present.

When we came to work out the question like a sum in arithmetic it began to look less feasible. There were certainly twelve thousand boats, all sizes, actively engaged, and to equip them all with engines would cost nearly, if not quite, \$3,600,000. Now if the annual bounty of \$160,000 should be made a sinking fund, it would require, as you see, more than twenty years to

cover that amount. Even if two thirds the outlay were borne by the fishermen, the remaining third would exhaust the bounty for over five years, and none of the engines would last that long.

Repulsed at one point, we tried another with more reason to back it up. When the wandering tariff commission sat at Barrington in 1907, we appeared before it (myself and seven Union delegates) demanding that gas marine engines be put on the free list. At that period, people in those parts of the Province were importing all the engines in use, and consequently the revenue, with its boasted surplus, was fattening on fishermen to the extent of almost one hundred dollars for every engine. The ministers on the commission winced a little at that novel view of the case—their fining the poor fellows who wanted to get ahead in their hard calling; but Canada "was a protectionist country anyhow." When brought to see there was no "protection" while imports continued unchecked, the commission, being convinced against its will, would not give in, of course.

Then we took them in the flank. A forcible plea was made there and then for "lobster" rope to be admitted duty free. The duty was 25 per cent. and the six-thread Manila cost the fishermen 18c per pound. In the next budget that kind of rope was free-listed and the fishermen rejoiced to get it for nine cents a pound!

Now just think what a saving was effected by that slight change. Twelve thousand craft, boats and small schooners, using rigging at the least 400 pounds a year each, in buoy-lines, trawl-lines, moorings, etc. Here was a cut of nine cents per pound on that enormous quantity, which, if you reckon it correctly amounts to nearly a half million dollars a year! It is truly astonishing. Yet that was the gross sum left in the pockets of the poor fishermen that year, by a single stroke of the pen. A half million saved is as good as a bonus of that size: yes, and far better. No wonder business in gas engines began to look up!

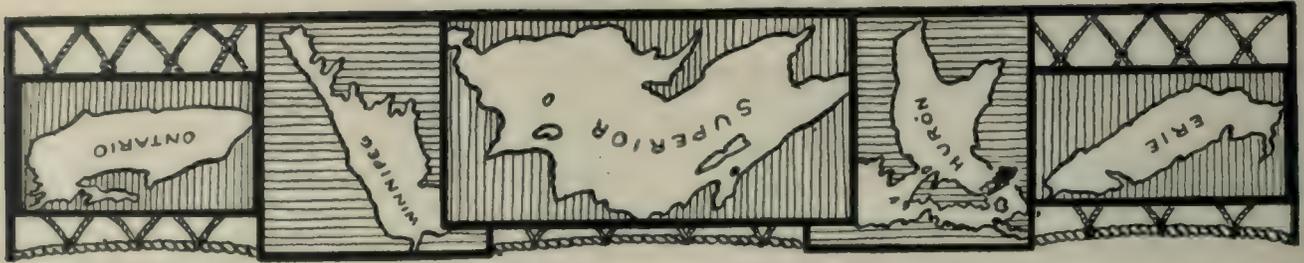
Now comes a more stirring trumpet-call on behalf of the fishermen. Rope did not stay at that reasonable rate. With the tariff removed, it began to mount; for many concerns put their heads together and pooled their wits, if not their wealth, to squeeze the consumer. Four years ago, that cordage had climbed to 18c again, on the flimsy plea of short crops of fibre. When brought before the bar of public opinion, the profitters relaxed a little seeing it was useless to lie any longer.

The war gave them the best excuse they ever had. But almost a year of the bloody conflict passed before they saw the point and seized the opportunity. Last year the price was 18c per pound retail. It is no twenty-five. No valid reason has yet been advanced for that extortionate rise. The curse of war, direful as it is never caused that inflation.

Here is an advance of nearly 200 per cent in ten years. Far more gear is used now than at any time in the past. Let the number of boats be the same as above and only a slight increase be allowed in the quantity of rope. It costs seven cents a pound more than it did last season: so we can safely figure up an additional burden of \$400,000 laid on the backs of those bread-winners, and by whose good will and pleasure?

Remove this burden, and such of the fishermen as do not already own motor-boats, may look more hopefully to the future.

M. H. NICKERSON.



Lake Erie Fishermen's Association Convention.

Affiliates with the Canadian Fisheries Association.



THE Lake Erie Fishermen's Association, with a strong membership composed of the license-holders and fishermen of Lake Erie, by a resolution passed at their Annual Convention in St. Thomas, Ont., on Feb. 7th and 8th, have affiliated with the Canadian Fisheries Association for their mutual benefit and the general development of the Fishing Industry in Canada.

The Lake Erie Fishermen's Association was formed exactly a year after the Canadian Fisheries Association. Since its inauguration it has grown to be an influential and healthy Association with aggressive and up-to-date officials and executive officers.

The recent Convention at St. Thomas was attended by over a hundred members and resulted in a gathering which shows a remarkable advance in progress of the fishing industry of the Lake. In fact, it was an outstanding example of the slogan of "Co-operation" which is manifesting itself among all engaged in the Fisheries of Canada and which is bringing results in the development and improvement of our fisheries as a whole.

The Convention opened at 2 p.m., on Wednesday February 7th, in the Council Chamber of the City Hall, St. Thomas, Ont., with the President, Mr. A. E. Ponsford in the chair, and Mr. Chas. Finlay, as Secretary.

In his opening address, President Ponsford urged upon the members the necessity for more co-operation and a better feeling between the different branches of the Industry. In his report of the past year's work, Mr. Ponsford said it had been most successful.

Many matters of importance had been carried out, and deputations had visited Ottawa and, although they had not obtained results as yet, they would undoubtedly come later. Many questions had been made concerning the Petrel, the Government boat used in patrolling the lake shores. He would suggest that the boat be tied up and a more substantial boat put on in its stead. The captain of the boat had been blamed by some, but he was not at the bottom of the trouble. The speaker urged that the association send deputations to Ottawa, where they could demand their rights. The Government did not, as some would have it, "put anything over" the fishermen; they were rather putting one over themselves.

Re-Elected President.



A. E. PONSFORD was again elected president of the association. In accepting this, he stated that he felt a great honor had been bestowed on him, and although he had not a cent invested in the fishing industry, he felt a great interest in the

fishermen. He had, he said, at one time assisted Chas. Finlay when he had failed to obtain his license, by taking it in his (Mr. Ponsford's) name.

The other officers were re-elected as follows: W. Crewer, vice-president; Chas. Finlay, secretary.

The executive committee for the year is composed of Pelee Island, E. F. Jones and Wm. Good child; Kingsville, Bert Westcott, A. S. Brown, J. A. Pastorias; West Kent, H. Goodison, W. Bates, J. D. Clute, Harry Dromgole, Bert Clay, E. Koehler, N. S. Cornell, A. McDonald, Bert Hales, G. A. Van Order, Mr. Kolbe, Abe Hoover, Chas. Moss, Chas. Ross.



MR. W. HENDRICKS of Erie, Pa., addressed the members on the subject of "Co-operation" and delivered a remarkable able speech. In his opinion co-operation in an industry among those engaged in it was for its general good and development. A fisherman, himself, he fully appreciated the advantages of pulling together, and in the course of his address, he showed a deal of hard common sense which could be very well adopted by some of our parliamentarians. Mr. W. Knister of Leamington followed and subjected the Chatham City Council and the Windsor and London papers to a raking fire of criticism for their actions in accusing the Lake Erie fishermen of giving preference to the American markets without considering the wants of the people at home.

Quoting from a local report, Mr. Knister said:

"If the Chatham Council would look in their Bradstreets and find out the financial standing of the fish dealers of their city before making these charges against the Lake Erie fishermen they would not be so apt to jump at conclusions. The Canadian people can have all the fish they want if they will pay for it.

The trouble of it, complained Mr. Knister, was that your small fish dealer will not pay for what they owe and when they get rich on the fishermen's products they get up and get out leaving as an asset to divide among the creditors a soap box, a horse frame and tin horn. Canadian are not a fish eating people, said Mr. Knister, and they need never go short of fish if they come down with the dust.

Would Stop Export of Fish.

The Chatham Council was going to stop the export of fish, and some of the papers supported them.

"Would the merchants of Chatham," asked Mr. Knister, "sell their stock to straggers without consulting Bradstreets, and send on a bill of goods from \$100 to \$300 without seeing in sight some chance of getting their money?"

In Chatham, according to Mr. Knister, Bradstreets

has no affluent or any other kind of fish dealers. Not seeing them there the fisher folk put them up as coming down with the cash C. O. D. or no fish. No fish appearing on the Chatham market the Council concluded that the Americans were eating it all. To keep the fish at home, Mr. Knister suggested the Government install a cold storage plant, operated under Government direction. The Government might then dispose of the fish to Chatham and elsewhere, but Mr. Knister was certain it would be on a cash basis.



Utilization of Fish Waste.

MR. KNISTER was followed by Mr. J. B. Fielding, F.Z.S., who spoke on the utilization of fish waste as it applied to the local fisheries. Mr. Fielding showed how much could be saved to the Industry by treating unmarketable and small sized fish, heads and offals and manufacturing this waste into fertilizers, chicken and cattle-feeding, and fish oils. Much of his work in treating fish waste had been experimental, but in a plant which he himself had erected, with crude machinery, at Port Dover, he had obtained results which prophesied a splendid future. Could these experiments be prosecuted further and a system of collecting this waste be evolved, he was safe in saying that the value of our present fisheries would be doubled.

As Mr. Fielding is well known to the Erie fishermen, his remarks were listened to with attention and many expressed the hope that investigations would be conducted to make use of the fish waste, not alone in the Lake fisheries, but all over Canada. We, the CANADIAN FISHERMAN, are unhesitatingly of the same opinion.

At an evening meeting, Mr. W. A. Found, Superintendent of Fisheries, Ottawa, gave an interesting lantern slide lecture on the Deep Sea Fisheries of the Atlantic and the Pacific coasts. The photos, many of which were taken on the Atlantic Banks by Mr. F. W. Wallace, Editor of the CANADIAN FISHERMAN, illuminated a phase of Canada's fisheries which were entirely new to the Lake men and as some remarked at the conclusion, it showed them that there were "other fisheries in Canada besides their own." Educational work of this nature gives one broader viewpoint and encourages a proper appreciation of the other fellow's work. Mr. Found is to be congratulated upon his happy choice of subject and the manner in which he delivered it.

A Scientific Talk on Scales.

IT is safe to say that Dr. A. G. Huntsman of the Biological Department, Toronto University, who followed with a lantern-slide lecture on "Fish Scales," gave much food for thought in the propounding of a theory which few ever heard of before. According to Dr. Huntsman, the scales of certain fishes were marked in concentric rings which told the age of the fish much the same as in a cross-section of a tree trunk. A scientist could not only determine the age of the fish by this means, but he could also tell its growth, when it was spawned, and the story of its life. By a series of tables and charts, the speaker showed how the migrations of certain fish could be traced and also the age of the fish in their "runs." Thus, in the Pacific sock-eye salmon, the marking of the scales on the fish showed its age and one could determine the year it spawned and the conditions of its life. The same applied to the Lake Erie herring and whitefish and the scale markings would be exceed-

ingly valuable in finding out the average age of the fish caught; its growth, and the chart of same would show just how the fish has been affected by temperature and local lake conditions.

What was apparently a dry scientific lecture, turned out to be of the greatest interest to the fishermen assembled, and we can imagine some of the Lake Erie men packing a magnifying glass or a microscope in their kit and doing some investigating on their own hook. Technical education of this nature is to be highly commended and we hope that more biologists like Mr. Fielding and Dr. Huntsman will pass their information on to the fishermen and keep them in touch with the results of scientific research.

Affiliation With Canadian Fisheries Association.

An Executive Committee meeting was held next day in the Grand Central Hotel, and Mr. F. W. Wallace, Secretary-Treasurer of the Canadian Fisheries Association outlined the work and objects of the organization with which he was connected. To the suggestion that the Lake Erie Fishermen's Association form an affiliation with the Canadian Fisheries Association, the meeting concurred without a dissenting vote. President Ponsford was heartily in favour of the move and felt certain that it would be to the mutual advantage of both. One of their number, Mr. N. S. Cornell of the Producers Fish Company, Port Stanley, was already a member of the Canadian Fisheries Association and could testify as to its value to the Industry. A resolution was formed and agreed to, both by the Executive and the members, and the matter of affiliation was settled.

By the passing of this resolution, another strong link was added to the Canadian Fisheries Association's chain. The Fishing Industry of Canada is becoming of greater value and importance as the years roll on, and if we in the trade, fishermen, producers, distributors, and retailers, stick together by our Associations, it is safe to say that its development will be healthy and along the right line. The fish man of today who thinks he can get along without co-operation is a back number. Here's wishing the Lake Erie Fishermen's Association the best of good luck and may its members do a bigger and better business every coming year.

HEAD OF THE LAKES BRANCH, CANADIAN FISHERIES ASSOCIATION.



THE Head of the Lakes Branch of the Canadian Fisheries Association, with headquarters at Port Arthur, Ont., held their inauguration meeting on November 17th last. At this meeting, which was attended by a number of Western Lake Superior fishermen, it was proposed to organize a Branch of the C. F. A. at the head of the Great Lakes.

Mr. F. Bowman of J. Bowman & Sons, Port Arthur, was elected Chairman; Mr. Andrew Sutherland Rossport was elected Vice-Chairman, and Mr. T. Craigie, Secretary, Fort William. The following Committee was appointed: Messrs. F. Bowman, Port Arthur; J. Bowman, Port Arthur; L. Maloney, Port Arthur; T. Craigie, Fort William; A. Sutherland, Rossport; J. A. Nicol, Rossport; Fred. Gerow, Rossport; J. Paulmart, Rossport; A. McKay, Rossport; F. Nicol, Port Coldwell.

At the meeting, it was moved by F. Dampier and seconded by A. McLeod, that the Secretary write the

(Continued on Page 56)

Side Lights On The New C. F. A. Officials.

Mr. Samuel Y. Wilson, President of the Canadian Fisheries Association, is one of the "chosen people" having been born on March 15th, 1868, at Port Errie, Banff-shire, Scotland. If he had been born two days

management, the business has thrived and now occupies a premier position in the Industry.

For three years, Mr. Wilson served as a member of the Halifax City Council: for twenty-six years he served in the 63rd Halifax Rifles and retired with the rank of Captain and a reputation as a crack rifle shot. Two of Mr. Wilson's sons are in khaki and serving the Empire at present.

Outside of his business, Mr. Wilson is a most enthusiastic student of fish life and marine biology. Improving fishing methods and technical fisheries education are his hobbies. In 1912 he was appointed a member of the Shell Fish Commission and his advice in that capacity was extremely valuable.

We congratulate the Association in choosing as its President a man who possesses such qualifications and who is willing to devote much of his time for the common cause.

Mr. Alfred H. Brittain, who was elected First Vice-President of the Canadian Fisheries Association, is Managing Director of the Maritime Fish Corporation,



later he might have been an Irishman, as ex-President D. J. Byrne would say. However, as "The Ould Sod" has had a worthy representative as head of the C.F.A., for two years, it is only right that "The Free and Independant Kingdom of Scotland" should get a look in.

In Mr. Wilson, the Association has not only got a good Scotsman, but also a good Canadian, and a good Nova Scotian. Perhaps he might take exception to being called a Canadian for it wasn't so very long ago when you'd insult a "Downeaster" by calling him other than a New Brunswicker or a Nova Scotian. However, we won't insist on any particular nationality, but there is one thing in his favour—he didn't stay too long in Scotland.

Coming to Canada when a boy with his father, the late Alexander Wilson who started a small fish business in Halifax in 1879, Mr. Wilson went through the public schools and the Academy of Halifax. Entered his father's business as a fish dealer in 1881 and for eight years studied and worked in all branches of the fishing trade. Made a partner in 1889, he succeeded to the business of A. Wilson & Son in 1913. Under his



Limited, with head offices in Montreal. Mr. Brittain, or "a la Bairnsfather—"Alf"—was born in Montreal, anywhere from thirty-eight to fifty years ago. (This is a guess. When we have time we'll look up his birth certificate, but we'll play safe by our assumption of his age), and after going through the usual trials of youth, finished his scholastic education in the Mont-

real High School, and began his business education in the College of Hard Knocks and Experience. In 1894, he was travelling salesman for Walter Grose, Montreal, and five years later opened up for himself as A. H. Brittain & Co., dealing in fish products, particularly boneless codfish. Selling this product was a hard job in those days, but Mr. Brittain succeeded in building up a substantial trade which is a staple today. In 1910, he promoted the Maritime Fish Corporation, Limited, by amalgamating with Messrs. Short & Ellis and Howard Anderson of Digby, N. S., and the Whitman Fish and Cold Storage Company of Canso, N. S. Under his managing directorship, the Maritime Fish Corporation has developed a huge trade in smoked, cured and fresh fish.

Upon the subject of Canada's fisheries, Friend Alf grows enthusiastic. The cub reporter who sojourns into his office for an item of news is received with open arms into the private office; is given a chair and a cigar and an ear-full of the advantages and economy of a fish diet. With his note-book full of "good dope" and his pencil worn to a stub, the newspaperman sallies forth uncertain as to whether he'll remain in the newspaper game or open up a fish shop. Publicity for the fish business never escapes Alf, and if he had his way, public monuments would be erected to the glorification of the finnan haddie, and Maisonneuve, in Montreal, would be holding a cod-fish aloft on his sword, while Edward the Peace-maker would be grasping a box of bloaters in his hand instead of a sceptre.

Mr. Brittain acted as Chairman of the Transportation Committee of the C. F. A. for the past two years and accomplished valuable work. He is Vice-President of the Schultz Mfg., Co., Ltd., Hamilton, a director of the St. Mary's Wood Specialty Co., Ltd., St. Mary's, Ont., a life-governor of the Montreal General Hospital, and on the Transportation Committee of the Canadian Manufacturers' Association. His leisure Associations are the Royal St. Lawrence Yacht Club; the Old Grey Mare Club, and laboratory work in finding new ingredients for the famous "Finnan Haddie Cocktail" invented by them.

Mr. A. L. Hager, newly elected Second Vice-President, is the Pacific Coast representative on the Official Board of the Canadian Fisheries Association. Of course, he is a good fellow. There are no knockers or pessimists in the C. F. A. That kind would never join. The best evidence of a man's popularity is when he is elected to high office. Mr. Hager is popular, both socially and in business.

The new Second Vice-President was born in Massachusetts of an old New England family. His earliest associations with the fish business was on old T Dock in Boston. Going all through the mill in America's greatest fishing port, Mr. Hager was sent out to British Columbia to represent the New England Fishing Company's halibut trade there. Under his management, the Canadian Fishing Company, Limited, was formed with head office in Vancouver and a branch at Prince Rupert. Of this Company, Mr. Hager is President, Treasurer and General Manager, and they have a fine new plant at the foot of Gore Avenue with wharves and cold storages, and operate a fleet of five Canadian halibut fishing steamers and five auxiliary fishing schooners.

"Al" Hager is a Prince of entertainers. Ask any eastern fish man who has visited him in Vancouver.

With him, the proverb is reversed. "Pleasure first—business afterwards," and we give him credit for being a master hand in both.

He is a terribly hard worker and is on the job all the time. You might not think he is busy if he is toting you around in his car seeing the sights, but his work goes home with him and to bed with him. He is never out of reach of a telephone and where-ever and when-ever you meet him, it's a safe bet he has half the day's mail in his pocket ready to digest it at the first opportunity.



A royal entertainer, a patron of all athletic sports, and an expert motorist, all who know him will say he's "one of the best." Here's to him in his new office!"

The Provincial Canning Company, Ltd., has been incorporated at Victoria, B. C., to carry on the business of packing, curing and canning. It will have its headquarters in Victoria.

Mr. A. L. Hager, of the New England Fish Company, has purchased for his Company the gasoline Schooner "Tyee" from Messrs. Sunde, of Sunde & d'Elvers, and the Moe Brothers — the purchase price has not been made public. The "Tyee" is one of the newest of the halibut fleet, having been built in 1915. Her dimensions are 92.7' length, 20.6' beam and 10.1' depth and she is equipped with a 140 h.p. Frisco Standard engine. Capt. Hultman was given the command of the vessel, and she was outfitted at Seattle and sailed with a crew of sixteen fishermen for Ketchikan, out of which port she will operate during 1917.

GOSSE-MILLARD COMPANY SPEEDING UP PRODUCTION.

Capt. Gosse, president of the Gosse-Millard Canning Co., Hereaton, Bella, Bella, and Sunnyside, on the Skeena left for the far north with a pile crew on Friday, Feb. 9th, to open his cold storage plant and cannery at Bella-Bella. This is an early start for British Columbia fish producers but Capt. Gosse considers that the demands of the markets in Canada and Great Britain justify increased production. He proposes to catch and freeze halibut, black cod, flounders and sole, as well as other varieties of fish at Bella-Bella and make weekly shipments either to Vancouver or Prince Rupert and thence to eastern point. The Indians of Bella-Bella are great fishermen and under the organization of the captain they will speed up production. At least 15,000 pounds of halibut a week can be caught by the Indians, while other fish should bring the total catch up to 30,000 pounds a week.

To Can Herring.

Besides the fresh fish catch the Captain plans to can herring and make a beginning of keeping his plant open and at work in producing fish all the year round. Capt. Gosse is one of the pioneer cannerymen of British Columbia, having personally built and operated many big canneries in British Columbia. He is a Newfoundlander by birth but has lived so long on the Pacific that he may be taken for a native son. He has progressive ideas and among them is the idea that a complete fishing plant with cold storage can be operated for practically twelve months in the year.

Utilizing Fish Waste.

The Gosse-Millard Packing Company has applied for a license to establish a fertilizing plant on the Skeena river. A license was held some years ago for such a plant by the Skeena River Fisheries but was not used. A plant to utilize the cannery offal on the Skeena has been needed for years and there now seems to be a concerted action on the part of the canners in the north to turn the refuse of the canneries into profits through fertilizer, poultry feed and fish oil. Capt. Gosse expects that he will have no difficulty in getting the canners to furnish his plant with offal free of charge, in the interest of keeping the Skeena river free from pollution.

To Can Grayfish.

Besides this the Gosse-Millard Packing Company have made all plans to put up at least 2,000 cases of grayfish the year. An experiment with grayfish was held this winter at the Vancouver cannery, their Fraser river plant, but it was found that the dogfish do not frequent the Fraser in any quantities in winter. It is certain there will be no difficulty in getting plenty of grayfish in the summer and the fall to make a start at trying out this new species as a fish good for food.

Much of the success of the Gosse-Millard Packing Company has been due to the part that F. E. Millard is secretary-treasurer. He is an experienced cannery manager and is highly esteemed by the whole community. Also, the firm has the benefit of the energies and abilities of Bob Gosse and Dick Gosse, the captain's two husky sons, H. E. Strong, his son-in-law. This combination makes youth unite with maturity and the result is progress and success. This company is one of the younger companies but continuing on the lines now laid it is bound to be a factor in the development of British Columbia fisheries resources.

HEAD OF THE LAKES BRANCH, CANADIAN FISHERIES ASSOCIATION.

(Continued from page 53).

Minister of Marine & Fisheries telling of our appreciation of the action of the Dominion Government in establishing Fish Hatcheries on the Great Lakes and abolishing the close season on the same.

The new branch held their First Annual Banquet in the Mariaggi Hotel, Port Arthur, on December 16th, 1916. Mr. H. A. McKibbin, Local Inspector of the Fisheries Department, and Capt. Sam Wright of the Fisheries Patrol addressed the members assembled and congratulated them upon having formed a Branch of the Association. They promised to be ready at all times to listen to any suggestions the Association might have at any time for the betterment and adjustment of the Fishery laws.

Among other speakers were Messrs. J. Bowman, Thos. Craigie, P. J. Dahl, F. W. Bowman, Thos. A. Craigie, and W. E. Doherty.

The new Branch got away to a splendid start and it will be of the greatest value to the Fishing Industry of the Lake. Co-operation is the life and soul of every industry, and none more so than the Fisheries which have been so long without any means of bringing those engaged in it together. The Head of the Lakes Branch promises to be a live organization which will do much for the Fisheries in their district and it behooves every fisherman and dealer there to join and assist in planning ways and means for the development and progress of the Industry—not only locally, but throughout Canada.

The Board is fortunate in having a good Chairman and Executive and they have set themselves the task of enrolling two hundred members within the year 1917. The Canadian Fisheries Association congratulates their new offspring and will watch its growth with parental pride. All enquiries for membership, etc., should be made to Mr. Thos. Craigie, Fort William, Ont.

The Canadian Fish & Cold Storage Company Limited of Prince Rupert, equipped the SS. "James Carruthers" as a beam trawler, during the early part of January, in order to conduct further experiments in trawling in the waters adjacent to Prince Rupert. The Company had some trouble with the fishermen in the beginning, but finally made an agreement whereby they were to pay 2c per pound for Halibut, 1½c for Black Cod, and ¾c per pound for all other edible fish, and on this basis the vessel made her first trip. She arrived at Prince Rupert on January 15th with 6,000 lbs. of Flounders and Soles, a few Halibut, and 3,000 lbs. of Codfish, Ratfish, Dogfish, and other scrap fish. During the trip her net was damaged very considerably. Her second trip was of only two days duration as she tore one net to pieces and lost the other. Capt. Knighthall, Master of the vessel, severed his connection with the Company on this occasion, and Capt. Jack Wells took command. The vessel is at present on her third trip, and is expected in Prince Rupert very shortly.

Reports from the West Coast of Vancouver Island are to the effect that the Herring are running in Alberni Canal the same as in previous years.

Canada's Fisheries For December, 1916.

(Furnished by the Naval Service Department).

The new lobster fishing season has been in progress since the 15th of November in Charlotte and St. John counties New Brunswick, and since the 15th of December in that part of Nova Scotia from Yarmouth county to Halifax harbour, but the reports and returns of the fishery officers for December show that rough weather, and two heavy gales especially, wrecked about 75% of the gear of the lobster fishermen and resulted in an unprecedentedly small catch of lobsters. In addition to the wreckage of traps there were two boats damaged and ten boats sunk or destroyed in Queens county Nova Scotia, several motor boats lost and others damaged in Yarmouth county, N. S., four motor boats lost and two boats and a schooner damaged in Digby county N. S.; nine motor boats damaged, one vessel lost and two others damaged in Charlotte county N. B. Also there were seven small boats lost and thirty nets and some gear destroyed in the Aspy Bay district of Victoria county N. S. Two Guysboro county fishermen were drowned.

As a consequence of the small catch the price of live lobsters in the United States markets soared to \$50. and in some instances to \$65, per crate of 140 pounds.

The total pack of lobsters to the end of December was 1,192 cases, while 3,436 cwts. were shipped in shell. During the corresponding period in the preceding year the pack was 4,006 cases, while 16,174 cwts. were shipped in shell.

The following table shows the quantity in cwts, of fresh lobsters, together with their value, landed from the opening of the season to the end of December in each of the years from 1912 to 1916, inclusive.

Year.	Cwts.	Value.
1912	19,100	\$200,804
1913	22,016	238,571
1914	11,371	118,684
1915	24,186	280,805
1916	7,546	135,793

The figures reveal a great fluctuation in the fishery from year to year, but that is almost entirely due to the changeable weather conditions of the winter season.

In view of the disastrous effect of the weather on the lobster fishery, it is gratifying to be able to record

Summary of the Quantities and Values of all Sea Fish caught and landed in a Fresh or Green State; and an estimate of the Quantities Marketed, or intended to be marketed, fresh, dried, pickled, canned etc., in the WHOLE OF CANADA, for the MONTH of DECEMBER, 1916.

the fact that the fishery for haddock was prosecuted with success in Nova Scotia, to which province the winter fishery is mainly confined, during the month. Compared with the same month last year the chief features of the months operations for haddock are large increases in Inverness county (which includes Port Hawkesbury) and in Digby county, with increased values all round. Respecting the rise in value it may be remarked, for example, that a slightly less quantity of haddock was landed in Guysboro county, but the value was more than \$6,000 greater. In Digby county the quantity of haddock landed was doubled but the value was trebled.

The following table, which shows the quantity of haddock landed in Nova Scotia during the month of December in the last five years, will indicate how the winter haddock fishery has grown in volume and value, notwithstanding the extreme hardships incidental to fishing in the North Atlantic at that season of the year.

Year.	Cwts.	Value.
1912	28,162	\$ 43,423
1913	37,569	79,095
1914	54,101	104,832
1915	45,738	106,157
1916	56,427	195,094

The results of the smelt fishery were only fair, during the month owing to the lack of ice on the rivers.

The quantity landed amounted to 15,090 cwts. and the value to \$109,969. This represents an increase of about 4½% in quantity and about 33½% in value over the results for the same month last year.

Between 50 and 60 smelt nets were lost in the Miramichi district of New Brunswick.

In north British Columbia stormy weather prevailed during the greater part of the month. In spite of this, however, the landings of halibut at Prince Rupert were over 2,000 cwts. greater than those for December in the preceding year.

In the Vancouver Island district there were heavy gales during the first part of the month. Herring fishing in the Pender Harbour, Nanaimo and Alberni districts was good, and the returns show an increase of almost 30,000 cwts. when compared with the results for December last year.

Totals for the Month of
DECEMBER, 1915.

Kinds of Fish.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Cann'd, etc.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.
	Quantity.	Value.		Quantity.	Value.	
Salmon, cwts.	2,732	\$ 25 864	.....	2,283	\$ 16,599	.....
Salmon, used fresh (or frozen) cwts. ....	.....	.....	2,612	.....	.....	2,283
Salmon, smoked, cwts. ....	.....	.....	39	.....	.....	.....
Salmon, mild cured, cwts. ....	.....	.....	36	.....	.....	.....
Lobsters, cwts.	5,840	97,223	.....	21,330	230,247	.....

Lobsters, canned, cases			1,192		4,006
Lobsters, shipped in shell, cwts.			3,456		13,318
Cod, cwts.	23,064	77,363		25,225	55,005
Cod, used fresh, cwts.			14,659		10,363
Cod, smoked, cwts.			592		10
Cod, green-salted, cwts.			1,129		2,867
Cod, smoked fillets, cwts.			369		700
Cod, dried, cwts.			1,286		2,335
Haddock, cwts.	56,687	195,963		46,978	109,213
Haddock, used fresh cwts.			34,226		23,989
Haddock, canned, cases			1,921		
Haddock, smoked, cwts.			8,143		9,887
Haddock, green-salted, cwts.			20		
Haddock, dried, cwts.			1,020		1,072
Hake and Cusk, cwts.	7,662	12,606		7,590	6,551
Hake and Cusk, used fresh, cwts.			3,063		964
Hake and Cusk, green-salted, cwts.					117
Hake and Cusk, smoked fillets, cwts.			375		1,023
Hake and Cusk, dried, cwts.			1,158		1,106
Pollock, cwts.	4,456	6,980		1,496	1,660
Pollock, used fresh, cwts.			371		80
Pollock, smoked fillets, cwts.			198		
Pollock, dried, cwts.			1,163		472
Herring, cwts.	123,514	131,696		97,391	105,617
Herring, used fresh, cwts.			38,915		15,381
Herring, canned, cases			1,711		5,085
Herring, smoked, cwts.			4		399
Herring, dry-salted, cwts.			48,000		44,882
Herring, pickled, brls.					32
Herring used as bait, brls.			896		505
Mackerel, cwts.	76	760			
Mackerel, used fresh, cwts.			76		
Sardines, brls.	2,445	9,035		6,235	6,660
Sardines, canned, cases			12,000		10,000
Sardines, sold fresh and salted, brls.			45		4,235
Halibut, cwts.	18,181	110,965		15,333	79,915
Halibut, used fresh, cwts.			18,181		15,333
Soles, cwts.	430	1,309	430	466	1,384
Flounders, cwts.	632	924	632	539	430
Skate, cwts.	373	522	373	227	214
Smelts, cwts.	15,090	109,969	15,090	14,340	73,010
Whiting, cwts.	10	40	10	18	72
Tom Cod, cwts.	6,271	6,215	6,271	5,298	4,345
Octopus, cwts.	18	144	18	8	48
Oysters, brls.	638	3,108	638	6,693	49,287
Clams, brls.	3,530	4,168		4,836	6,770
Clams, used fresh, brls.			2,466		3,574
Clams, canned, cases			1,064		1,262
Scallops, brls.	400	1,000		2,033	4,866
Scallops, shelled, gals.			800		4,066
Crabs, Cockles, etc., cwts.	361	2,151	361	486	1,848
Squid (bait fish), brls.	574	5,500	574	252	2,280
Total value		803,505			756,021

IMPORTANT EXPRESS COY, DECISION.

A decision of considerable importance to shippers of perishable products has just been handed down by the Court of Appeals in British Columbia. In times past it has been a matter of doubt as to what the duties of an Express Company have been in the matter of prompt delivery of goods handed in for shipment by express. Although in the past there has been but little contention in the matter, the Express Companies have assumed that they were not bound to forward goods received, immediately, and by the first outgoing conveyance. It appears that a moving picture company delivered some films to the Dominion Express

Company in Vancouver, in time to reach Victoria the following Monday morning, to be shown on the Monday afternoon. For some unknown reason, the Express Company did not send the shipment from Vancouver to Victoria, which is only a matter of six hours run by the first boat, and the films did not reach Victoria until Tuesday, causing a loss to the consignee there, through his inability to show the films on the Monday. The British Columbia Court of Appeals has decided that it is the duty of an Express Company to forward a shipment as soon as possible after it is received, and to deliver same to consignee with the least possible delay.



ONTARIO
Department of Game and
Fisheries

The attention of the fishermen is invited to the following provisions of the Dominion Special Fishery Regulations for the Province of Ontario and of the Ontario Game and Fisheries Act.

Fishing by means other than angling or trolling except under the authority of a lease, license or permit issued by this Department is prohibited.

Non-residents, that is persons domiciled in the Province for a period of less than six months, are not allowed to angle or troll without an angler's permit.

No one shall fish for or take large mouthed or small mouthed black bass, maskinonge, speckled trout, brown trout, rainbow or other Pacific trouts, otherwise than by angling.

No one shall fish for large mouthed or small mouthed black bass, maskinonge, salmon, speckled trout, brown trout, rainbow or other Pacific trouts through the ice.

The sale or export of small or large mouthed black bass, of maskinonge and of speckled trout, brown trout, rainbow or other Pacific trouts is prohibited.

The sale or export of pickerel (dore) less than fifteen inches in length, measuring from the point of the nose to the centre of the posterior margin of the tail, is prohibited.

The taking of whitefish or salmon trout less than two pounds in weight is prohibited.

The use of trap nets is prohibited.

Fishing with gill nets in Lake Erie, from December 15th to March 15th, both days inclusive, is prohibited.

No one shall set or place nets other than hoop nets, dip or roll nets, in any river or creek or within five hundred yards of the entrance thereto. This prohibition shall not apply to carp fishing.

CLOSE SEASONS (Commercial Fish.)

Pickerel.—In water other than the Great Lakes, Georgian Bay, North Channel and connecting waters—April 15th to June 15th.

Whitefish and Salmon Trout.—In waters where commercial fishing with gill nets is not permitted—October 5th to November 5th, both days inclusive.

In the Bay of Quinte.—November 1st to November 30th, both days inclusive.

In waters other than the Bay of Quinte, Great Lakes, Georgian Bay, North Channel and connecting waters, where commercial fishing with gill nets is permitted—October 5th to November 30th, both days inclusive.

LIMIT OF CATCH (Commercial Fish.)

(By Angling or Trolling.)

Pickerel.—Twelve per day.

Salmon Trout.—Big and Little Rideau Lakes, three per day. Other waters except Great Lakes, Georgian Bay, North Channel and connecting waters, five per day.

A. SHERIFF,

Deputy Minister of Game and Fisheries.

Department of Game and Fisheries.

Toronto, Feb. 1st., 1916.

Exceptional Angling Opportunities

are offered by the Province of Quebec, which is the only one that leases exclusive hunting and fishing territories over large areas of forest, lakes and rivers, both to Clubs and private individuals, with the privilege of erecting camps thereon.

Membership may be obtained, if desired, in many existing clubs, with camp privileges already provided, and often with the right of erecting private summer homes on suitable sites on the club territory.

On all unleased Crown Lands and Waters, angling and hunting are absolutely free to residents of the Province, and the only charge to non-residents is the cost of the non-resident fishing or hunting license.

To the Wholesale Fish Trade

The attention of dealers who receive their fresh fish from Portland and other foreign sources is directed to the exceptional opportunities of obtaining their supply from the Baie des Chaleurs and the North Shore of the St. Lawrence, to their own advantage and that of their customers, and to the benefit of the fishermen of the Province of Quebec.

For all information apply to—

**The Minister
 of Colonization, Mines and
 Fisheries
 Of the Province of Quebec**

NEW WAR LOAN.

The new War Savings Certificates which have been created by the Government to encourage thrift and economy and to give everyone an opportunity to assist in financing our war expenditure, are now on sale at every bank and money order post office in Canada. The \$25 certificate sells for \$21.50, the \$50 for \$43, and the \$100 for \$86.

As an investment these certificates offer many attractive features—chief of which are the absolute security and the excellent interest return. For every \$21.50 lent to the Government now, \$25 will be returned at the end of three years.

There are two other features which are especially interesting to small investors. First, the certificates may be surrendered at any time, if the buyer should need his money; and second, each certificate is registered at Ottawa in the buyer's name and, if lost or stolen, is therefore valueless to anyone else.

But while they are excellent from an investment standpoint, the certificates should appeal strongly to Canadians because they offer to those who must serve at home a splendid opportunity for a most important patriotic service. The person who honestly saves to the extent of his ability and places his savings at the disposal of the Government by purchasing these certificates, may feel that he is having a direct share in feeding, equipping, and munitioning our Canadian soldiers, who are so nobly doing their part.

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Proceeds of this stock are for war purposes only.

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DEPARTMENT OF FINANCE, OTTAWA
OCTOBER 7th, 1916.

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JAN. 9, 1917

FINANCE DEPARTMENT
OTTAWA

HALIBUT ARRIVALS PACIFIC COAST PORTS JANUARY 1 TO JANUARY 31 1917.

AT PRINCE RUPERT, B.C.:

- Jan. 1. Panama, U.S., 50,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 2. Polaris, U.S., 45,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 5. Vansee, U.S., 60,000, Atlin Fisheries Limited.
 Jan. 8. Sitka, U.S., 40,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 11. Seymour, U.S., 14,000, Pacific Fisheries Company.
 Jan. 13. Andrew Kelly, 16,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 15. Jas. Carruthers, 6,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 17. W. R. Lord, 5,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 18. Yakutat, U.S., 33,000, Booth Fisheries Company.
 Jan. 18. Agnes B., 12,000, Booth Fisheries Company.
 Jan. 18. Director, U.S., 22,000, Pacific Fisheries Company.
 Jan. 19. Geo. E. Foster, 65,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 19. Grier Starrett, 15,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 20. Lillian M., 5,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 21. Alaska, U.S., 30,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 22. Doreen, 6,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 22. Sumner, U.S., 30,000, Pacific Fisheries Company.
 Jan. 22. Tuladi, 13,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 22. Sumner, U.S., 30,000 Pacific Fisheries Company.
 Jan. 22. Tuladi, 13,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 23. Margalicee, 7,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 23. Constance, U.S., 40,000, The Canadian Fish & C. S. Co., Ltd.
 Jan. 25. Nellie, U.S., 5,000, Pacific Fisheries Company.
 Jan. 30. Commonwealth, U.S., 8,000, Booth Fisheries Company.
 Jan. 30. Sitka, U.S., 22,000, Pacific Fisheries Company.
 Jan. 31. Puritan, U.S., 29,000, Booth Fisheries Company.

All vessels not specified "U.S." are of Canadian registry.

Cargoes without prices represent Company-owned vessels.

AT VANCOUVER, B.C.:

- Jan. 13. Kingsway, 80,000, The Canadian Fishing Co., Ltd.
 Jan. 16. Pescawha, 10,000, The Canadian Fishing Co., Ltd.
 Jan. 25. Carlotta G. Cox, 70,000, The Canadian Fishing Co., Ltd.

AT STEVESTON, B.C.:

- Jan. 24. Nevaline, 12,000, Columbia C. S. Company.
 Jan. 26. Trapp, 10,000, Columbia C. S. Company.

AT KETCHIKAN, ALASKA:

- Jan. 5. Knickerbocker, 75,000, New England Fish Company.
 Jan. 19. Rolphe, 20,000, Washington Fish Company.
 Jan. 22. Constitution, 27,000, Ripley Fish Company.
 Jan. 23. Aurora, 6,000, Ripley Fish Company.
 Jan. 27. Eagle, 12,000, Glacier Fish Company.
 Jan. 27. Rescue, 6,000, Glacier Fish Company.
 Jan. 31. Knickerbocker, 30,000, New England Fish Company.
 Jan. 31. Prospector, 12,000, New England Fish Company.

PACIFIC FISH NOTES.

The marriage is announced of Mr. Henry Wilke, Manager of the New England Fish Company's Branch at Ketchikan, Alaska, to Miss Kathleen Rounsefell, daughter of Mr. and Mrs. George Rounsefell of Ketchikan, Alaska. The marriage took place on December 21st, at Long Beach, California. The happy couple spent their honeymoon at the home of Mr. Wilke in Washington, Mo., afterwards visiting Chicago, Boston and New York. They returned to Ketchikan at the end of January, where they will reside.

The Fraser River Cannery Association, representing all the Canneries in British Columbia, have made representations to the Dominion Government to put an embargo on the export of Fresh Salmon to United States points.

This is to keep the American Cannerymen from coming to British Columbia and purchasing boat loads of Dog Salmon in the Fall. The B. C. Wholesale Fish Dealers Association, which represents the Fresh Fish dealers in Southern British Columbia, met the British Columbia members of the Dominion Fisheries Advisory Board, and while being in favor of the embargo, requested that it be permissible, provided the embargo is placed, to ship Fresh Salmon packed in ice in boxes containing 200 lbs. net weight of fish, and also Frozen, Salt and Smoked Salmon in any sized packages, to United States points. Mr. F. H. Cunningham and Mr. D. N. McIntyre are the B. C. members of the Dominion Fisheries Advisory Board, and they will meet the members of the Board from other Provinces, in Ottawa, in the very near future. It is this Board that recommends to the Government any changes in the Regulations which may be in the best interests of the Fishing Industry. It is not likely that the British Government may commandeer either part or all of the 1917 catch of fish from the Pacific Coast on British Columbia. This of course is contingent upon the war lasting, and there being a more acute shortage of fish in Great Britain.

This embargo proposal has been discussed very fully in British Columbia by those interested, and considerable opposition has developed to the scheme on the part of the Salmon fishermen as represented by the Fraser River Fishermen's Protective Association, they believing that the limitation of markets will tend to reduce prices.

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BUYS

CISCOES; CHUBS. TULIBEES; BLUE FINS; white STURGEON; frozen as well as salted round HERRINGS. Red and fat, Pacific Coast mild cured SALMON.

I pay market prices for all varieties of prime, fresh or frozen fish, suitable for smoking. Remittances upon safe and satisfactory arrival. Authentic reference. Communicate with me.

W. Irving Atwood, Pres.

N. D. Freeman, Treas.

W. Elmer Atwood, Vice-Prest. Irving M. Atwood, Sec'y and Mgr.

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THE CANADIAN FISHERMAN

*THE MAGAZINE OF CANADA'S
 :: COMMERCIAL FISHERIES ::*

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During the months of December and January three companies have been operating buying stations for Herring at Pender Harbor, viz,—The Canadian Fishing Company Limited, Watson Bros., and the Royal Fish Company, all of Vancouver, B.C. The run of Herring at Pender Harbor this season has been very good indeed and all the buyers have been able to get as much Herring as thir principals could handle. Some of the Herring has been frozen for Bait, but the greater portion has been put down as Salt Herring, or Smoked.

Mr. Albert Davidson, formerly with the Grand Trunk Pacific Railway Company at Prince Rupert, has been transferred to Vancouver, and will act as Local Agent for that Company in Vancouver. Mr. L. V. Duce, whose place Mr. Davidson is taking, has been promoted to Assistant Freight Agent of the Grand Trunk Pacific Railway Company at Edmonton.

The Management of the Pacific Fisheries Limited of Prince Rupert, has been taken over by Mr. G. Starr, vice Mr. H. O. Roberts. It is rumored that the San Juan Packing and Fishing Company have purchased the Cold Storage Plant at Juneau, and that Mr. H. O. Roberts has been placed in charge of same. Mr. Roberts has already gone North.

News from Ketchikan Alaska indicates that the run of Herring at that point has been very good, and a large quantity has been put away in the freezers for bait purposes. Up to the present time there has been no news of any Herring striking into Prince Rupert Harbor. The enormous runs which took place every Winter at Prince Rupert up to 1914, have apparently ceased.

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in the purest of Olive Oil. Also our Ivory Brand of Pure Boneless
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B. A. Bensley.

THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, MARCH, 1917

No. 3



SOME OF OUR
BIG ONES

FRASER RIVER STURGEON
AND
ATLANTIC HALIBUT

The Magazine of the Commercial Fisheries of Canada
and Newfoundland



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Mark of
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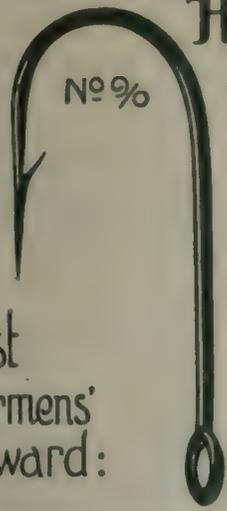
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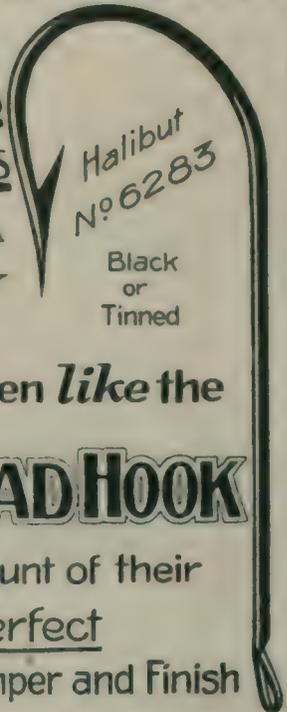
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Department of The Naval Service

Fisheries Branch

In addition to the full statistics of the Fisheries which are published yearly in the Annual Report, the Department issues monthly bulletins containing statistics of the sea fisheries and general information in regard thereto. Copies of these will be sent free to any applicant.

The value of the Fisheries of Canada is now about \$36,000,000.00 annually.

The demand in the home markets for fresh and mildly cured fish, is expanding very rapidly. The Department pays one-third of the express charges on less than car-load lots on all shipments of such fish from the Atlantic Coast to points as far west as the eastern boundary of Manitoba, and from the Pacific Coast, as far east as this boundary.

Close Seasons for Fish in Force on June 1st, 1916

Kind of Fish:	Nova Scotia.	New Brunswick.	P. E. Island.	Quebec.
Bass (Achigan).....				1 April to 15 June.
Maskinonge.....				15 April to 15 June.
Ouaniche.....				1 Oct. to 30 Nov.
Oysters.....	b1 Jan. to 30 Sept.	b1 Jan. to 30 Sept.	b1 Jan. to 30 Sept.	b1 Jan. to 30 Sept.
Quahaugs.....	Oct. 1 to May 10 & July 1 to Aug 31.	Oct. 1 to May 10 and July 1 to Aug. 31.	Oct. 1 to May 10 and July 1 to Aug 31.	
Pickarel.....				April 15 to May 15.
Salmon (netting).....	Aug 16 to Feb. 28	Aug. 16 to Feb. 28.	Aug. 16 to Feb 28	Aug. 1 to April 30.
Salmon (angling).....	eAug. 16 to Jan. 31.	Sept 16 to March 31.	Sept. 16 to March 31	Sept. 16 to April 30.
Smelts.....	fApril 1 to July 1.	fMarch 1 to June 30.	fApril 1 to June 30.	April 1 to June 30.
Sturgeon.....		June 1 to July 1.		June 1 to June 30.
Speckled Trout.....	Oct. 1 to March 31.	Oct. 1 to March 31.	Oct. 1 to March 31.	Oct. 1 to April 30.
Salmon Trout.....				Oct. 15 to Dec 1.
Whitefish.....				
Kind of Fish:	Ontario.	Manitoba.	Saskatchewan and Alberta	British Columbia.
Bass (Achigan).....	a1 Jan to 15 June.			
Maskinonge.....	1 Jan. to 15 June.			
Ouaniche.....				May 1 to Aug. 31
Oysters.....				
Quahaugs.....				
Pickarel.....	cApril 15 to May 15.	April 15 to June 20.	dApril 1 to May 15.	
Salmon (netting).....				
Salmon (angling).....				
Smelts.....				See regulations.
Sturgeon.....				
Speckled Trout.....	cSept. 15 to April 30.	Oct. 16 to June 15.	Oct. 16 to June 15.	
Salmon Trout.....	gOct. 5 to Nov. 30.			
Whitefish.....	gOct. 5 to Nov. 30.	Sept. 15 to Nov. 19.	Sept. 15 to Dec. 15.	

a—Except in Lake Erie west of Pt. Pelee where close season is May 24 to July 15.
 b—Except on leased areas, where close season is from 1 July to 31 Aug.
 c—See regulations.
 d—Except in waters north of or intersected by 54th parallel north lat. between eastern boundary of Saskatchewan, and 109th meridian and in waters intersected by or north of 55th parallel n. lat. west of this meridian to western boundary of Alberta, where there is no close season.
 e—Except in Cape Breton Island, where close season is from Sept. 27 to May 31.
 f—Bag-net fishing season Dec. 1 to Feb. 15; gill-net fishing season Oct. 15 to Feb. 15. Licenses required for bag-nets or gill-nets.
 g—For exceptions see regulations.
 h—Except in waters specified in (d) where close season is from 1 Oct. to Nov. 30.
 For British Columbia See Regulations.

THE CANADIAN FISHERMAN

A MONTHLY JOURNAL DEVOTED
TO THE COMMERCIAL FISHERIES
OF CANADA AND NEWFOUNDLAND
THE SCIENCE OF THE FISH CULTURE
AND THE USE AND VALUE
- OF FISH PRODUCTS -

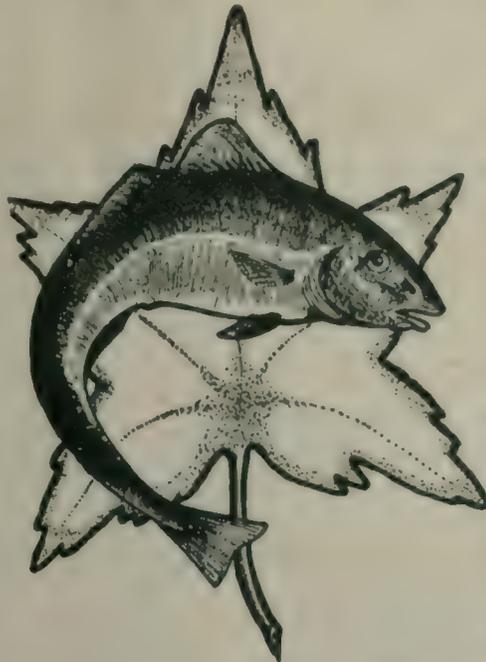
F. WILLIAM WALLACE
EDITOR

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Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, MARCH, 1917

No. 3

SIXTEEN OUNCES—ONE POUND.

We were taught the above in school, and it still holds good. However, in this modern age, the old law of *avoirdupois* becomes strangely controverted. The innocent consumer goes into a store and buys a pound of tea. The grocer hands over a package containing tea which weighs one pound—weight of package included. Instead of receiving a pound of tea, the consumer receives about 14 or 15 ounces. The same holds good with various other kinds of package and canned goods, though there are some lines which put up their articles nett weight exclusive of package.

In various lines of canned goods, one finds in purchasing a so-called 1 lb. tin, that it is certified to contain not less than 14 ounces of meat, fruit, etc. We presume the deficiency is for the purpose of defraying the cost of the package and to make the price appear reasonable.

A well known Canadian packer of canned fish calls our attention to certain provisions of the proposed "Fish and Shellfish Cannery Inspection Act." Section (e) Paragraph 27 states:

"Descriptive matters on the label shall be free from any statement, design or device regarding the fish, etc., which is false or misleading in any particular."

Sections (b) and (c) of the same paragraph state "that a true and correct description of the contents of the can and the nett weight of the fish shall be plainly printed in a conspicuous place on the label."

All of this is in order and very proper, but the Department of Fisheries, in a communication to canners accompanying the draft of the Act, states: "The Department is in possession of information to the effect that it is highly advisable to explicitly provide for the uniform net weight of the meat to be contained in each can, rather than leave the weight to the discretion of each individual canner. It is proposed, therefore, that the following provisions be made:

1 pound can shall contain not less than fourteen ounces of meat.

$\frac{3}{4}$ pound can shall contain not less than ten and one-half ounces of meat.

$\frac{1}{2}$ pound can shall contain not less than seven ounces of meat.

Unusual weights shall contain an amount of meat in proportion to the weight of the can used."

From the standpoint of a consumer, and having the best interests of the Canadian fish canning industry at heart, we cannot endorse this deception. A one pound can should contain one pound of meat exclusive of the weight of the can, and at the rate of sixteen ounces to the pound—the other weights in a similar ratio.

Short weights, however honestly they may be made under duly legalized provisions, are to be deprecated. The public is beginning to wake up to these things, and the High Cost of Living has set machinery in motion which is rousing the consumer to demand value and weight for money paid. Full weight packing may raise the cost for the goods, but the public will always

pay for full weight, and same should be marked on the can.

Legislation, countenancing short weights, establishes bad precedents. If it continues, the consumer will be purchasing cloth at 32 inches to the yard: coal at 1,950 lbs. to the ton, and so on. The day will come when everything will have to be standardized in weight and measure. Let the Fish Canning Industry of Canada standardize everything now and keep to the old avoirdupois rule of 16 ounces to one pound—exclusive of the package.

TALKED TO DEATH.

On the Pacific Coast, an agitation has been instituted by United States fishing interests to have a Bill passed in Congress "Prohibiting the importation into the United States of all fish caught in the North Pacific, through any foreign country, unless in bond from a port of the United States or Alaska."

Briefly, this is aimed by the Seattle fishing interests at the huge fishing industry of Prince Rupert—which owing to its strategical position as the terminus of the Grand Trunk Pacific Railway and the nearest rail shipping point to the Gulf of Alaska fishing banks, has captured a great share of the North Pacific halibut fishery formerly enjoyed by Seattle.

We are not at all impressed by the reasons which the Seattle interests put forth in advocating the passage of the bill, and the charges which they make against the Canadian Government are childish inasmuch as they overlook all the rights invested in proximity. The halibut fishing grounds are at the doors of Prince Rupert, and Prince Rupert is justified in making full use of every means to expand through the development of a natural resource within easy access.

Seattle, as a terminus for the North Pacific halibut fishery, is out of it, and the Alaskan town of Ketchikan, some 80 miles north of Prince Rupert, is suggested as the landing port for United States fishing vessels. Ketchikan, however, has no rail communication with the United States, and fish landed there would have to be shipped by steamer to Seattle. For the shortest rail haul to the Eastern U. S. markets, the fish would have to be landed at Prince Rupert and shipped over the G. T. P. Ketchikan's existence as a fishing terminus will depend on the Canadian Government and the Grand Trunk Pacific.

Our friends to the south are out for all they can get. Were the position reversed, and Prince Rupert in Seattle's place, it is safe to assume that we would suffer exactly the same treatment. If they have such legislation as the above put through, Canada can retaliate by abolishing the modus vivendi license of the Atlantic fisheries.

As the Huns would have it, our claims are justified by looking at the map. The territory of Alaska south of the sixtieth parallel of latitude should belong to British Columbia. This part of United States territory is to the British Columbian much as a German colony in England would be to a Britisher.

However, it's an ill-wind, etc. The same United States Senators who talked President Wilson's Armed Neutrality Bill to death, also talked the aforementioned Pacific Fisheries Bill out of the present session of Congress. For the present, the Bill is dead.

EXPORT TRADE IN FISH FROM CANADA.

For the twelve months ending January, 1917, Canada exported fishery products amounting to \$24,696,944 in value. During the month of January, 1917, fish to the value of \$2,784,824 was exported.

March Fish Day Calendar

1917		MARCH					1917
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	
				1	2	3	
4	5	6	7	8	9	10	
11	12	13	14	15	16	17	
18	19	20	21	22	23	24	
25	26	27	28	29	30	31	

April Fish Day Calendar

1917		APRIL					1917
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	
1	2	3	4	5	6	7	
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	
29	30						

EVERY TUESDAY A FISH DAY ALSO.

Comparative Statement of previous years is as follows:

Export for the year 1915	\$18,661,560
Export for the year 1916	22,407,687
Export for the year 1917	24,696,944

Within two years, our fish exports advanced \$6,035,384 in value.

Looking up the export statistics for the year previous to the war, we find that Canada's fish exports during the statistical year, March 31st, 1913, to March 31st, 1914, were valued at \$20,698,849. The statistics for the twelve months ending January, 1917, show an increase of practically \$4,000,000.

Considering that the large German and other markets have been closed to our fish products, and production has fallen off, the figures show a healthy advance. The exports of frozen fish to Great Britain, are, in the main, responsible for much of the increase, as well as a rise in value of salt and canned fish.

POOLING THE EMPIRE'S FISHERIES.

An editorial in the British Fishing News and cable advices from Canadian newspaper correspondents in Great Britain tell of the work and plans of the Empire Resources Development Committee. The main idea of the Committee is to develop and utilize the great natural resources of the Empire in order to pay the enormous war debt which will rest upon us after the war.

Quoting from the above sources, the fisheries scheme is outlined as follows: The Committee's ideas regarding the fisheries have been explained by Mr. Alfred Bigland, M.P. He is at present controlling the oil and glycerine trade for the Government and he takes the present Government control of the whole fishing in the Antarctic as an example of what might be made general. "By giving licenses to men to fish in these waters on condition that the oil was retained for this country, we had received during the war 660,000 barrels of this oil. It was a revelation to him that we had such a supply, and while the Germans were paying for little lots \$1,500 a ton for such oil, he was buying it for the Government at \$190 a ton." Mr. Bigland argues that, in view of the fishery wealth of the waters round Canada and Newfoundland, a similar Empire monopoly might be established, with, of course, the consent of the Dominions, and in this way we could become the purveyors of fish in all its forms, almost to the whole world. Incidentally, he stated, that the Grand Trunk Pacific had offered him refrigerating plant to bring fish from Prince Rupert to Liverpool at a penny per ton, which would be reduced to three farthings or a halfpenny on big Government contracts being entered into. Mr. Bigland suggests that the Imperial authorities, acting jointly, should not leave the development of this fishery wealth to private in-

dividuals, but should take it up and push it as an Imperial asset. The whole of the vessels now used in the North Sea for minesweeping and other purposes could, after the war, form the nucleus of an Empire fishing fleet and thus increase the British fish supply to at least four times the present British fish consumption, which is 600,000 tons yearly. He contemplates a scheme extending over ten years, and he calculates that if the State secured a profit of two cents a pound, which is \$44.80 a ton, it would be quite possible to make a gross profit in 10 years of \$180,000,000, out of which the sinking fund for the development charges must be met. Further, "it would be for the State to regulate the prices in every town in the country; and the State should have the control of the home fisheries as well."

The information at our disposal being meagre, we are loathe to attempt any critical analysis of the scheme, and our present remarks are subject to correction. The idea is very large and rather sweeping in the easy manner in which the fisheries of Canada and Newfoundland are to be harvested by great fleets of British steam trawlers for the benefit of the Empire.

The Canadians who have money invested in our fishing industry, and who have established plants and built up a fishery at much expense in time, money and labor, are not at all likely to welcome an Imperial Government fishing scheme whereby Government owned vessels will fish Canadian waters and sell the product at Imperial prices to Imperial consumers—the profit retained by the Government to pay off the National Debt.

The fishing industry in Canada was established by pioneers who were under no obligation to the Mother Country. In the days when they came to Canada, they were left to scratch along as best as they could. Canada and her resources were not thought a great deal of then. The fisheries of the present day were developed by these pioneers and their descendants, and most of them made but a bare living at it. Of recent years, our fishery resources have developed and progressed to be of great value. The years of toil are bearing fruit, and the fishing industry of Canada is now coming into its own and reaping the benefit.

Not for one moment do we believe that the Canadian salmon canners of the Pacific Coast, the salt and dried fish interests of the Atlantic, the fresh fishermen, lobster canners, the inland waters fishermen, etc., will stand idle while all the fisheries which they have developed are to be thrown into one jack-pot for an Imperial monopoly.

In the Atlantic salt Bank and market fishery there are about 200 fishing schooners which represent an investment of from \$4,000 to \$15,000 for each vessel. Were an Imperial fleet of steam trawlers loosed on our fishing banks, these craft, useless for any other calling but fishing, would be laid up. The steam trawler is not yet general in our fishing fleets, and

while we believe it will be in the future, yet steam trawling in Canada will be carried on by Canadians in Canadian owned trawlers—built to replace the schooner fishing craft when the demands of the market make it necessary.

Imperialism and State Ownership is splendid thing to talk and write about—especially by those who have no invested interest in the natural resources of the Empire. Canada's fisheries belong to Canada, and while we will welcome British capital for their development, yet we think the Bigland scheme too colossal and in danger of infringing on the rights of the Canadians who have already developed the Industry in Canada, and who will be willing to bear their share of the War Debt with the same spirit as they have contributed money and men to the Empire's forces.

PERSONALS.

Visitors to Montreal recently were Mr. F. J. Hayward, Vancouver, B.C.; Mr. S. Y. Wilson, Halifax, N.S.; Mr. W. Hamar Greenwood, Vancouver, B.C.; Mr. W. F. Leonard, St. John, N.B.; Mr. R. T. Matthews, and W. P. Scott, Queensport, N.S.; Capt. Geo. Doggett, Douglstown, Que. All are well known in the fish business.

Writing from England recently, Sergeant Roy M. Whynacht, formerly with the Maritime Fish Corporation, Ltd., at Digby, says:

"I note with pleasure that the Canadian fish business is booming; and I am firmly of the opinion that it will continue to boom. Shortly after my arrival in England, I had the privilege of taking a journey along the east coast from London to Edinburgh, and, after spending a few days in visiting the historic places of the two capitals, I decided to run up to Aberdeen and have a look at their fisheries. On visiting one of the large plants, I was, at first, surprised to find that they apparently had nothing on some of our Canadian plants; but, after hearing an explanation for this state of affairs, I concluded that young Miss Canada was not yet quite abreast of old John Bull so far as the handling of fish was concerned. The condition of the stock was by no means good, but my remark to that effect was answered by the word, "Norway" from my conductor. They are forced to import almost any grade of stock available, as their own production is limited to the operations of only such steam trawlers as are unfit for sweeping mines and ramming submarines. But there certainly must be something doing when the whole of their fine fleet of trawlers are on the job. Their method of indoor drying is totally different from ours; instead of spreading their fish, they hang them up by the tails over numerous small coke fires. A great portion of this work is carried on by women—some fine looking ones too;—and they seemed quite amused over the surprise of the Canadian visitor. Before I left the plant, my conductor handed

me a fine tribute to the quality of recent consignments of pickled fish from Nova Scotia, which I know was not said simply to please me."

PISCATORIAL PARAGRAPHS.

Referring to a shortage of feed for cattle, a daily paper states: "From all parts of the province reports are reaching the Department of Agriculture that the **shortage and high cost of feed** is causing farmers to get rid of their stock. The situation has become so disturbing that special steps are being taken to counteract the prevailing tendency." Why don't the Government get busy and investigate the possibilities of processed fish waste as cattle feed. It has been tried out and is successful both as a food and economically.

With regard to the reports of a "Fish Famine" which emanated from Ottawa recently. When the report was published in the press, wires were despatched from several producers offering all kinds of fish at prices but little in advance of pre-war days. There is no famine; prices have advanced less than other commodities, and the whole blame for apparent scarcity rests with the transportation companies, who have been unable to bring the fish up from the producing points. They, in turn, blame the cold and snowfalls of this winter and the heavy demands for rolling stock to transport troops and munitions.

A sitting of the Admiralty Court was held in Montreal on March 6th, to adjust the claims of Messrs. W. C. Smith & Co., Ltd., of Lunenburg, N. S.—owners of the fishing schooner "Lucille B. Schnare" which was run down and sunk on Grand Bank last summer by the steamer "Wartenfels". The "Schnare's" owners claimed \$25,000 damages from the owners of the steamer. Curiously enough, the "Wartenfels", at the time of the collision, was a former German steamer and a British prize, and was sunk shortly afterwards by a torpedo from a German submarine. Judgment was reserved.

Owners of Newfoundland sealers which will set out in the middle of March, have decided to ship no unmarried men between the ages of 20 and 30 who have not offered their services to the country, unless they remain at home to permit other relatives to be at the front. The sealing flotilla will be the smallest on record. It will consist of 10 ships: The "Terra Nova," "Eagle," "Viking," "Ranger," "Thetis," "Neptune," "Erik," "Diana," "Bloodhound" and "Njord." All are wooden vessels of the old type and none will take more than 200 men, while the greater number will carry smaller crews. The reason is that all the steel ships have been sent to Russia, and the smaller ones have been withdrawn for service in various capacities in connection with war work.

Mr. John N. Cobb, Editor of the "Pacific Fisherman," has resigned to take up the position of Assistant Superintendent of the Alaska Packers' Association. Mr. Cobb is one of the best informed men on the commercial fisheries in North America, and is one of the few who combine a practical knowledge of the fishing business with the theories of the scientist. As members of the "Fourth Estate," we regret his leaving the ranks, but wish him every success in his new position.



MILLIONS IN FISH WASTE

BY THE EDITOR.



DO you realize that out of 88 pounds of salmon caught on the Pacific Coast, only 48 pounds goes into the cans? Of the 32,000,000 pounds of lobsters used by canners on the Atlantic, only 6,500,000 pounds are canned, and the balance, 25,500,000 pounds is thrown away as waste. Every variety of marketable fish caught and dressed for the table represents a waste of from 30 per cent to 50 per cent on the round fish. In the halibut, 14 lbs. in every 100 lbs. is calculated for the head of the fish as waste — roughly 3,500,000 pounds of annual waste which is slashed off at the docks on the Pacific and Atlantic. These wastes, combined with the vast amount of dogfish and other unmarketable species knocked off the hooks and hove out of the nets into the water again, represent a waste of fish material in our own industry of something like 250,000 tons annually.

These are startling figures, but they can easily be substantiated. Just think of the enormous amount of offal which is dumped into the sea by the vessels fishing on the banks of the Atlantic and Pacific; think of the offal buried and dumped by the lake fishermen; the waste material of the canneries and the shore fishing stations. Every Atlantic fishing schooner landing a trip of, say 100,000 lbs. of fresh cod, haddock, pollock, hake, cusk, halibut, etc., has, in dressing the fish, thrown at least 25,000 lbs. of waste overboard. The amount of unmarketable fish slatted off the hooks may amount to as much more.

The question of utilizing this enormous fish waste is one of the most important in our fisheries to-day. It can be economically utilized and processed to yield great profit — that has been proved by work in other countries, and to a very small extent, in our own. On Lake Erie, the Producer's Fish Company at Port Stanley, have erected a small plant to manufacture fertilizer and fish oil out of the fish waste which comes to them. They have made a profit on their venture, and could make more were their machinery more suitable for the particular work of processing fish material. The Robinson Glue Company, at Canso, N.S., manufacture an excellent fish glue from the fish offal of the Canso fish docks, and operate profitably. The Canadian Government have the Dogfish Reduction Works for manufacturing fertilizer located at Canso, N.S., but owing to either lack of proper machinery, skilled knowledge, or good management, the scheme

has been a failure, though the products found a ready market. These, to our knowledge, are the only fish waste plants in the Dominion.

The importance of present day economic problems demand that an investigation be made into the possibilities of utilizing this fish waste, and the investigations should be started now. The Canadian Fisheries' Association have looked into the problem and have already memorialized the Marine and Fisheries Department to have investigations and experiments conducted with a view to making the best use of this fish waste as soon as it is possible to get the necessary appropriations and secure the services of the biologists to undertake the work.

With proper plant and machinery, and not expensive either, it is possible to manufacture fish offal into fertilizer worth \$30 per ton. Every ton of fish waste can produce from 12 to 15 gallons of fish oil as well, which is worth from 35 cents to 80 cents a gallon according to its grade of refinement. Fish meal, manufactured from strictly fresh offal, is worth from \$50 to \$60 per ton as food for live stock. Fish glue is worth from 75 cents to \$2.50 per gallon according to grade. There are many other things which can be manufactured from fish offal, but which need some experimental work to determine the most economical way of producing them.

The enormous benefit to the fishing industry in a profitable utilization of this fish waste cannot be overestimated. The fishermen, in every branch of the industry, will receive more for their fish. At the present time, they are getting paid for just that portion which is marketable — the balance represents waste for which they get nothing. Everything that comes on the hooks or in the nets is of value and worth something if it could be utilized, and it can be utilized.

The drug, soap, leather, oil, paint, glue trades and agriculture are heavy purchasers of products manufactured from fish waste, and in every instance, so far as Canada is concerned, they have to purchase these materials from foreign manufacturers — who, more astute than we are, have realized the value of fishery waste.

We strongly urge that every man engaged in the Fishing Industry of Canada give some thought to this problem and demand that Governmental machinery be set in motion to make use of the enormous waste incidental to the fisheries.

Propagation of Fish on the Great Lakes

Address by Mr. S. W. DOWNEY,

Supt. of the Federal Hatchery, Put-in-Bay, (Ohio) before the Lake Erie Fishermen's Association.



EVIDENTLY something that I said at that time "that I first had the pleasure of meeting your Hon. Officer of Fisheries, Mr. Schleihau, gave him the impression that I knew something about the propagation of the fishes of the Great Lakes, for he wrote to me asking that I come over and address this meeting and upon my informing him that I was not a public speaker and could not comply with his request, he said, "Then if you can't make a speech, come over and tell us a story", and assuming, I suppose, that the subject of fish would be the one that I would be the least likely to fall down on, he said, "Tell us a fish story", and as fish stories have been in vogue ever since the incidents were occurring from which the Bible was written, I could not well refuse. You know that in holy writ, we read of one, Jonah having been swallowed by a whale, and after three day's residence in the whale's belly, was spewed up on dry land. There is no record of just why the whale disgorged Jonah, but it is just possible that he had been smoking cut plug or natural leaf and the nicotine was too strong for the whale's stomach. However, be that as it may, it seems that ever since the telling of this whale of a story, anybody and everybody consider themselves licensed to tell fish stories.

But I am inclined to think that the story that Mr. Schleihau really expected me to tell at this time, is a true statement along the lines of artificial propagation of the better species of the fishes of the Great Lakes, together with my opinion of the good resulting from the work; also for my reasons for thinking that this work is necessary.

Why Is Artificial Propagation Necessary?

In trying to answer this question we will confine our remarks to the discussion of that best of all fresh water fishes, the Whitefish, and the same reasoning will apply to the other species of fishes, of the Great Lakes that are being propagated for the purpose of perpetuating the fishing industry, and the conservation of one of the best and cheapest natural food supplies that God has given us; and, as the time for preparing an article on this subject is limited, I will take the liberty of quoting verbatim an article that was prepared by myself, and read before the Fourth International Fisheries Congress, held at Washington, D.C., in 1908, entitled, "Plans for Promoting the Whitefish Production in the Great Lakes."

"In discussing this subject it will first be necessary that we understand something of the habits and the manner of reproduction of these fishes, and the probable increase and losses in numbers under natural conditions, and since the same conditions exist, and the same reasoning will apply to all the lakes of the chain, we will confine our remarks to the conditions in Lake Erie.

Breeding Habits and Natural Reproduction of the Whitefish.

The adult whitefishes are migratory, leaving the lower end of the lake and the deeper waters each year as the spawning season approaches and the breeding instinct prompts them, and seeking their natural spawning beds, which consists of the reefs among the islands and the rocky and sandy bottoms of the shoaler portions of the lake. Most of these reefs and shoals are of that particular formation called "honeycombed rock" — that is, instead of being gravelly or smooth, these rocks are dotted with holes and small cavities, into which the eggs, as they are voided by the fish, may drop and be comparatively safe from being eaten by the suckers and other spawn-eating fishes, water lizards, or other enemies, and also from being covered by mud, silt, and other filth, and smothered, as they would be if deposited upon mud bottom.

Were the whitefish nest builders, and did they pair as some of the other fishes do so as to perform the function of fertilizing their eggs with any degree of certainty, the chances for a large production of young under such favorable conditions would be very good indeed. But they are not nest builders; neither do they mate; on the contrary, they approach the spawning grounds singly and in schools, and are what are known as "school spawners", the female extruding her eggs wherever she may happen to be, regardless of whether there is a male fish within close proximity or not. In consequence, but very few of the fish come together so as to perform the functions of fertilization. And when it is known, and was demonstrated by Mr. J. J. Stranahan, by a very careful experiment in the fall of 1897, that the life of an unfertilized whitefish egg, if left under water, is less than four minutes, while more than 50 per cent. of them perish in 1½ minutes, and the life germ contained in the milt of the male fish may be fairly supposed to live no longer under the same conditions, it will readily be seen that the percentage of eggs fertilized under natural conditions must of a necessity be very small. In fact it is estimated by those fish culturists who have had most to do with the propagation of whitefish that not more than one per cent. of the eggs are fertilized when deposited under natural conditions. Now at this rate let us see how many fertile eggs each pair of adult whitefish will produce each season. It is estimated that the average number of eggs produced annually by each female whitefish is 35,000. The greatest number of eggs the writer has ever known to be secured from one fish was 150,000 from a fish weighing 11 pounds, giving 13,636 eggs to the pound of fish. This would be equivalent to a little more than 37,000 eggs to the fish weighing 2¾ pounds, and as the average weight of the spawning whitefish is from 2½ to 3 pounds, it will be seen that 35,000 eggs to the fish should be nearly correct. Then if each pair of whitefish produce 35,000 eggs, and but one per cent. of them are fertilized, 350 fertile

eggs to the pair is all that can be expected to commence with. As the period of incubation for whitefish eggs is from 128 to 150 days, and as these fertile eggs must lie on the lake bottom all this time, in danger of destruction by being smothered in mud or filth as previously shown, and exposed to the still greater danger of being eaten by all kinds of aquatic life that feed at the lake bottom, it is quite evident that but few of these 350 fertile eggs will survive to reach the fry stage. It is evident, moreover, that nature never intended there should be such a large increase in numbers as would result from anything like a perfect fertilization and hatch, for in that case the lake in a short time would be so densely inhabited that the waters could not produce sufficient food for all; neither would there be room in the lake for them if they came to maturity. It is therefore safe to suppose that naturally the number increases but little if it overbalances the loss, and reasoning from the known to the unknown, we are sure that this is true.

The number of young produced each year by those fishes, of which there is a large number, which carry their young through the period of incubation and produce them alive so far as the writer has been able to learn, ranges from one to 22, giving an average of 11 young to each pair of fish; and as these fishes are very numerous where found, it appears that this rate of increase in the fry state is sufficient to more than overcome the losses under natural conditions. Thus by analogy we have the proof that an increase of 11 young from each pair of fish of any kind including whitefish is more than enough to overcome the natural losses.

Work of the Hatcheries.



BUT the whitefish on account of being such an excellent food fish, is more sought after than many others and is taken by every device that man has been able to invent and in the greatest numbers possible on all occasions, so that the natural losses are many times multiplied by this take of fish which may justly be termed "artificial" losses. Now if this artificial loss is continued, then in order that the loss shall not greatly overbalance the natural production, there must of a necessity be introduced an artificial increase. Happily this can be accomplished in several places by the aid of the hatcheries. The method employed is to have men go out with the commercial fishermen when they raise their nets, and collect the eggs from the ripe fish. This is done by expelling the eggs from the female fish into a common milk pan in as dry a state as possible, after which they are fertilized by using the milk of the ripe male fish immediately. They are then carefully washed, brought to the hatchery and placed in the jars, where they remain until hatched. In addition to this method of saving the eggs, many fish are penned each year, this is done by hanging a net on the back of that part of the pound net called the crib and when the fish first commence coming onto the grounds, before they are ripe enough to spawn, the fishermen as they raise their nets take out the unripe fish and place them in these nets on the back of the crib. Then the station tug which is provided with large tanks on the deck through which a stream of water is constantly pumped, visits these nets and takes out the fish, transferring them to the tanks and conveying them to the station where they are transferred to the pens. Here they are held until they ripen when the eggs are secured, and the

fish after a few days when they have regained their normal condition are returned to the fishermen from whom they were obtained and are sent to the market. It is perhaps well to say in this connection that spawning the whitefish in this manner in no way injures them for food; in fact these fish that are spawned and then held a few days before putting them on the market are in much better condition for consumption than if they had been marketed while still carrying the eggs. Moreover the whitefish, unlike many others, in the best condition for food at spawning time for the reason that it is very fat and the flesh is juicy and sweet, and the water temperature being low at this time the flesh is firm and flaky, while earlier in the season, when the water is yet warm the flesh is much softer and the flavor not as fine. But no digress further, we will continue by saying that from the fish collected and held in pens as described above, we have collected in a single season at one point along 122,160,000 eggs of fair quality. In other instances, where the fishermen operate on a small scale and small boats are used for the purpose, arrangements are made whereby the fishermen collect the eggs themselves and are paid for them at so much per quart for fertile eggs whereas if we put men in boats to spawn the fish we pay nothing for the eggs as the fishermen are directly benefited by the work of propagation. These small operators usually fish gill nets on the reefs, and as the whitefish do not frequent the reefs until ready to spawn, from 50 to 75 per cent of their catch are ripe fish.

Measures Necessary to Insure Increased Production.

From a practical experience in whitefish work of over thirty years, and by consultation with other fish culturists, we find that the average hatch of the eggs collected and taken to the hatcheries is from 75 to 85 per cent. Assuming the lower figure to be the correct one, if each pair of whitefish as was previously shown, produce 35,000 eggs, by the assistance of the hatcheries we get three fourths of 35,000 or 26,331 fry as against the 11 fry that these same fish would have produced if eggs had been left to themselves, or 2,398 times as many as it was intended by nature for them to produce. Even allowing that the whole of the 1 per cent naturally fertilized hatch, giving 350 fry as the number produced by each pair of fish, the hatchery would still beat nature by 25,981 fry, or a little over 74 times as many and the fry produced at the hatcheries are just as strong and vigorous and their chances for reaching maturity are just as great as are those hatched naturally. Then if by the lower calculation we produce 74 times as many fry by collecting the eggs and hatching them at the hatcheries as the fish would produce if left to themselves, it is obvious that the best plan to promote the whitefish production of the great lakes is:

To so arrange matters that artificial propagation shall be generally applied to the reproduction by having hatcheries established at every available point where a sufficient number of eggs can be secured to warrant their maintenance. It is not necessary that the hatcheries be operated upon as large a scale as those at Detroit, Sandwich and Put-in-Bay, but wherever enough eggs can be secured to give a hatch of from 25 to 50 millions, if these points are remote from the larger stations put up a hatchery and operate

upon as economical a scale as possible to stock these hatcheries, not only collecting the eggs from the ripe fish as caught by the fishermen, but penning and holding the green, but nearly ripe fish, until they do ripen, pursuing the method described above so that practically all the fish caught will have contributed toward this production before being placed upon the market.

To make this plan the more effective, so as to get the greatest increase possible from the fish caught, a law should be enacted compelling the fishermen to collect, or allow the hatcheries to collect, all the eggs from the ripe fish, and to place the green fish in the auxiliary nets for penning; the fishermen to be paid a fair price for the eggs so taken by them, and a fair remuneration for their labor in penning the fish, and to receive pay for all fish lost in penning.

As a further part of the plan we would have a law enacted prohibiting the taking or the offering for sale any undersized whitefish, making the size limit large enough so that every fish before being placed upon the market would have had a chance to reproduce at least once and thereby contributing toward increasing the production.

That you may form some idea of the amount of work accomplished by the hatcheries, I have prepared a table showing the number of eggs collected from each species of fish propagated at the Put-in-Bay station during the past 16 years.

Making a grand total of 12,413,227,000 eggs received at the station during this time. It would be well to state right here, that not all the eggs taken at this station were kept and hatched here, but nearly one-half of them were shipped to other points to be hatched, but from the eggs retained at the station there were hatched and distributed fry of the different species of fish, in totals as follows:—Whitefish, 2,100,560,000; pike-perch, 1,845,980,000; lake herring, 164,910,000; lake trout, 4,796,000 and about 6,000,000 of the common perch. Showing an average hatch of 142,535,000 white-fish, 115,373,75 pike-perch, 20,614,500 lake herring for the eight years that herring were propagated, and 959,100 lake trout for the five years that they were propagated and 3,000,000 perch for the two years that they were handled.

A comparison of this table by a series of years will show that the first five years produced:

Number of Eggs Collected During the Years From
1900 To 1915.

	Whitefish	Pike-Perch.	Lake Herring.	Lake Trout.	Perch.
1900	194,234,000	138,900,000	61,760,000	1,500,000	8,064,000
1901	335,860,000	341,025,000			
1902	256,000,000	305,000,000	47,680,000		
1903	54,564,000	325,000,000			
1904	237,774,000	431,375,000		1,500,000	
1905	226,931,000	380,250,000	228,640,000	1,900,000	
1906	186,409,000	422,100,000	84,470,000	2,000,000	
1907	336,250,000	784,750,000	18,325,000	2,000,000	
1908	373,046,000	616,775,000			
1909	219,508,000	663,600,000	104,000,000		
1910	310,440,000	594,050,000	73,400,000		
1911	82,280,000	797,905,000			
1912	350,080,000	239,000,000			
1913	488,240,000	133,500,000			8,064,000
1914	479,290,000	592,000,000	7,700,000	2,000,000	10,856,000
1915	351,081,000	511,715,000			
Totals	4,481,987,000	7,276,945,000	625,975,000	9,400,000	18,920,000

This plan should only be universal with the states bordering upon the Great Lakes, but should be international, making the same conditions on the Canadian side as in the States and preventing any loophole through which the regulations could be evaded.

This plan would be strenghtened by making a closed season during the heat of summer when it is so nearly impossible to get to market in an edible condition on account of the hot weather and the high temperature of the water from which they must of a necessity be taken. All the fish taken at this time of the year are a total loss to reproduction, as they go to market with all their unripe eggs in their ovaries, and for every female so taken there is a loss to reproduction from 11 to 350 fry if it had been left to spawn naturally, or of approximately 26,000 fry if the eggs were allowed to ripen, collected and hatched at a hatchery.

Whitefish Eggs 1,078,432,000 and pike-perch 1,541,300,000
The next five years 1,541,144,000 and pike-perch 2,767,495,000
The last five years 1,750,971,000 and pike-perch 2,274,120,000

The second five years showing an increase in round numbers of 500,000,000 whitefish eggs, and 1,200,000,000 pike-perch eggs, and the last five years shows an increase of 200,000,000 whitefish eggs, and a falling off of pike-perch eggs of nearly 500,000,000 from the second series, but still retaining an increase of nearly a billion of eggs over the first five years, and the last year of the table, 1915 shows a take of 351,080,000 whitefish and 511,715,000 pike-perch eggs, as against 194,234,000 whitefish and 138,900,000 pike-perch eggs in 1900 the first year, an increase of nearly double for

the whitefish, and more than three times as many of the pike-perch eggs. And this gain in the collection of eggs has not been accomplished by extending the field of operations, we are covering practically the same area as before, but with less advantages for securing the eggs, for in addition to the change in the manner of fishing in the vicinity of the station from the pound net to the trap net, thereby eliminating all chance of penning fish for their eggs, the Ohio State hatchery erected about eight years since but a few rods from us receive some of the eggs from this field, yet notwithstanding the fact that the fishing has been prosecuted to the fullest extent all these years and the greatest number of the fish removed from the lake, the take of eggs has steadily increased and as the number of eggs to the fish has not increased, there must have been an increase in the take of fish, and why should it not be the case; this last spring we liberated in Lake Erie 209 millions of whitefish fry, and while we place no insurance on them, nor guarantee any certain percent. of them reaching maturity, yet we do know that there are just 209 millions more chances for mature fish than there would have been had we not been in operation, for everyone of the eggs from which these fish were produced would have gone to market with the fish and been a total loss to reproduction. "But", I hear some close season advocate say, "if those fish had been left in the lake to reproduce, would they not have produced these fry themselves!" To this I will reply "They certainly would, but it would take them from 74 to 2,392 years to do it", as was shown heretofore, and I do not think that even the advocate of a closed spawning season, would care to wait that long for a mess of fish.

But the proper thing for all those living on the borders of the Great Lakes, and especially those interested directly or indirectly in either the fishing industry, or the propagation of fish and the conservation of this great natural food supply, is to work on some plan whereby the adult fish may be removed from the waters, placed on the market for food for the people, at the same time providing employment for thousands of men at good wages, and at the same time not only maintain the number of fish now in the lakes but provide a steady increase, and gentlemen: I believe that this not only CAN be done, but that it is BEING DONE to-day by the aid of the hatcheries.

**Is the Propagation of Fish an Economical Measure?
That is Aside From the Conservation of
a Food Supply!**



LET us see: During the fiscal year 1915, there were supplied from the Put-in-Bay, Ohio, Station, to be hatched at other points, 235,700,000 whitefish and 305,450,000 pike-perch eggs, and from the eggs retained at the station there were hatched and distributed 209 millions whitefish and 56 millions pike-perch fry, making 265 millions all told. This work was all done at a total cost of \$14,591; now if 10 per cent. of these fish live and reach a weight of 2½ pounds each, we will have 66,250,000 lbs. of fish, worth to the consumer to-day 15c a pound, amounting to \$9,937,500; but some will say, "We don't think that 10 per cent. of the fry planted will reach maturity; well we think there will, but not to be hoggish in the matter, let us say 1 per cent. reach the 2½ lbs. This will give us 6,625,000 lbs., which at the same price will give a valuation of \$993,750, which is

a little more than 6,810 times the cost of production, or 6,810 per cent. on the investment: a better rate of interest, even than John D. Rockefeller makes in the oil business.

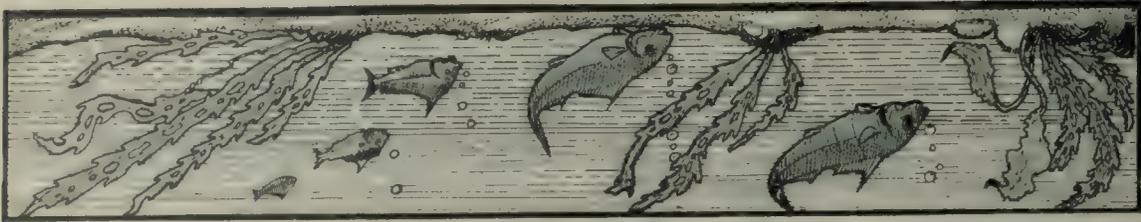
The reason for my thinking that 10% or more of the fry planted reach maturity, is from the results of experiments along this line. Somewhere about twenty-two years ago there were liberated in the Clacamas River on the Pacific Coast, 5,000 marked salmon fingerlings; about four years later the State Fish Commissioner of the State of Oregon, had notices put in the papers telling the fishermen of these marked fish and asking that all the fish caught so marked be sent to him and he would pay the market price for them, and as a result, these were either seven fish less, or seven more, than 10 per cent. of the number liberated sent to the Commissioner. And of course not all the marked fish that entered the Columbia River were caught, nor were all those that were caught sent to the Commissioner, but there were enough to show conclusively that a much larger percentage of the young fish liberated reach maturity than was at first supposed there would be.

GOOD WILL THE DOMINANT NOTE.

During the summer months of the year 1915 some 1,500 miles of railway — Winnipeg to Quebec, 1,350 miles, and Fort William to Graham, 193 miles—were added to the Intercolonial Railway and Prince Edward Island Railway, making over 4,000 miles now operated under the name and ownership of the Canadian Government Railways.

Connecting Winnipeg with Quebec, and Montreal with the Atlantic ports of Halifax, St. John and the Sydneys, the Government Railways occupy a new and important position in relation to the transportation question of the Dominion, an importance which the great war requiring the immense transfer of troops and munitions through Canadian territory has been instrumental in demonstrating, resulting in a traffic development away beyond ordinary calculations. This increase of traffic has affected every branch of the service. Additions to the rolling stock have been necessary and to-day the Government Railway are better equipped with motive power than at any period in their history.

With traffic booming there has been a large demand upon experienced and skilled labor. The principal shops at Transcona and Moncton are working at full capacity, and the same remark applies to the smaller shops. The relationship between the employees and the management based upon the spirit of good will, are of the happiest. With the introduction of the merit system individual worth and conduct meet their due reward. Other agencies at work to improve the lot of the employees are the sick, accident and provident funds, the latter being a form of pension on an equitable basis of contribution by employe and the Government. The "First Aid" movement is well organized and has rendered valuable assistance in numerous cases. "Safety First" is practised and encouraged. Thus it will be seen that the welfare of the human element in the conduct of the Government Railway is an essential feature, which with the encouragement of co-operation combine to make a system where GOOD WILL is the dominant note of operation. — Labor News, Hamilton, Ont.



Report of Drift-Net Fishing for Herring

Operations Carried on During Summer of 1916 by
Dominion Government

By J. J. COWIE

The Herring Drift-net operations of 1916 having been placed under my direction I now beg to submit my report and observations thereon, as follows:

It has long been regarded as a matter of course that large bodies of herring of good quality, such as inhabit the waters off the coasts of Europe, are to be found, during the summer months, some distance off the Atlantic coast of Canada.

In Canadian waters, however, the places where herring gather offshore are as yet not very well known, largely because herring fishing is carried on close to the shore by means of fixed or anchored gear. That this mode of fishing is still in vogue is no doubt due to the fact that the value of herring and the demand and outlet for them in Canada has not been sufficient in the past to induce fishermen or fishing companies to go to the expense of outfitting vessels for the purpose of locating the herring schools offshore and prosecuting that fishery alone.

In European waters the offshore haunts of the herring are well marked by reason of the fact that fishing has been carried on for very many years in sea-going vessels with what are called drift-nets, which may be operated in a different locality each night and at any distance from the land. The proximity of the North Sea to the great consuming centres of the continent of Europe and the enormous demand for herring that has always existed there were the main factors in the development of a deep-sea drift-net fishery on the European side of the Atlantic.

With a view, therefore, of adding something of practical use to our knowledge regarding the herring schools off our shore and of finding out whether it is possible to bring to land catches of the proper quality and size of fish in sufficient quantities to not only overcome the handicap of an uncertain bait supply under which the codfishing fleets work each summer but to supply the growing demand for herring as a food as well, the department's steamer **Thirty-three** was fitted out with drift-nets and sent to sea at the beginning of last season.

Drift-net fishing takes place at night time, the number of nets that may be carried by a vessel and put in the water at one time varies from 30 to 70 in accordance with the size and suitability of the vessel.

The nets are tied the one to the other, top and bottom, so as to form an unbroken string of netting when in the water. On arrival at the desired fishing ground

one end of the fleet of nets is thrown overboard loose, and while the vessel moves ahead at the rate of about three miles an hour the whole fleet is gradually put out. The vessel is then stopped and the near end of the nets made fast to her. Both vessel and nets are thus allowed to drift or move with the tide or current; hence the name drift-net fishing.

Just before sunrise the nets are hauled on board and all speed made for land in order that the fish may be discharged in the best possible condition.

Drift-net fishing was successfully carried on in the gulf of St. Lawrence during the summers of 1906-07 by this same steamer, and for that reason the exploration work of the past year was confined to the open Atlantic coast. The field of operations covered by the steamer in the course of the season extended eastward along the coast of Nova Scotia from Halifax to Cape Smoky in Victoria county. Four or five trips were made through the Gut of Canso to George Bay; besides one trip westward to Shelburne county. The work began early in May and ended late in August. The catches were sold for curing, kippering and baiting purposes in the port nearest to the various fishing grounds, where buyers were prepared to handle them. Much foggy and rough weather intervened which on many nights prevented the setting of the nets.

The fleet of nets used consisted partly of new Scotch drift-nets of 2½-inch meshes, and partly of Norwegian nets, with meshes from 2½ down to 2 inches extended measurement which were used during the preceding season.

Unfortunately the latter were found to be defective as fishing instruments owing to the fact that the netting was laced to the cork rope in such a way that when the nets were in the water the meshes would close instead of open by any weight on the foot rope.

My duties in connection with the introduction and operation of the Fish Inspection Act called me to other parts of the coast during most of the time that the steamer was at work, consequently I saw very few of the catches landed.

A record was kept on board the steamer, however, of the places where and the dates when fishing was carried on, the temperature of the water, the number of nets set on each occasion, the quantity of fish taken and the quality and size of the herring. In addition to this the buyer of each catch furnished information concerning the size and quality of the fish; all of which is embodied in the following table:

QUALITY AND SIZE OF HERRING.

FISHING GROUND.	Date.	Weather	Temper-Number Nets Set.		Quantity of Fish Taken.		Quality and Size of Herring.
			Conditions.	water.	Herring.	Mackerel.	
Victoria and Cape Breton Counties							
3 miles off Sydney Harbour	May 29	Moderate East wind	48	26	35 baskets	.....	Spring fish; about 18% large full, 65% full, 17% medium full.
5 miles off St. Ann Bay	" 29	Moderate East wind with fog	48	42	56 "	.....	" " " 20% " 40% " 30% " 10% spent
" "	" 26	Strong E. wind with fog and rain	48	31	29 "	.....	" " " 20% " 40% " 30% " 10%
12 " E.N.E. off Sydney H.	" 25	Fine wind variable	52	39	10 herrings	.....	" " " 20% " 40% " 30% " 10%
13 " off St. Ann Bay	" 30	Moderate S.E. wind	46	40	10 baskets	.....	" " " 20% " 40% " 30% " 10%
10 " off Cape Shockey	June 1	Strong S.W. wind	43	30	5 "	.....	Quality poor; mixed sizes.
" off St. Ann Bay	Aug. 2	S.W. wind. Moderate	..	42	No herring	.....	No appearance of fish either on 2nd or 3rd August.
Richmond and Guysborough Counties							
10 " S. E. of Liscomb	May 8	South wind. Foggy	39	24	38 herrings	.....	Quality fair, but fish small.
13 " E. of Canso	" 16	N. W. wind. Clear	39	35	3 baskets	.....	" mixed, medium and large.
17 " off Point Michaux	" 18	Fine S.W. wind. Fog	43	31	40 "	.....	" poor
12 " S.S.W. of Whitehead	June 5	Light S.W. wind. Fog	43	31	6 "	.....	" good; about 65% large full, 35% full
14 " " "	" 6	N.E. wind. Fog and rain	43	31	23 mackerel	.....	" " 50% extra large full, 25% large full, 25% full.
13 " " "	" 13	Light E. wind	46	55	9 "	.....	" " 80%
8 " " "	" 13	Moderate E. wind. Fog and rain	45	56	1 basket	.....	Dogfish present.
8 " " "	" 13	" " "	46	51	7 1/2 baskets	.....	Quality good; about 60% large fat fish; 25% medium fat fish, without milt or roe; 10% full, and 5% very small.
8 " " "	" 14	Moderate E. wind. Clear	46	51	7 "	.....	Quality good; about 50% large fat fish; 35% medium fat fish, without milt or roe; 15% full.
6 " " "	" 22	Moderate S.W. wind	53	44	21 "	.....	Quality good; all large, fat fish, without milt or roe.
15 " E. of Canso	" 23	Wind variable. Clear	49	44	38 "	.....	" all medium fat fish, without milt or roe.
65 " E. of Point Michaux	" 27	" " "	52	55	2 "	.....	" mixed, large and medium; the former full, the latter with no milt or roe.
13 " E. of Canso	" 28	Strong S. wind. Fog and rain	48	55	2 "	.....	Quality fair. Dogfish abundant.
14 " E.S.E. of Isaacs H.	July 10	S.W. wind and fog	50	44	2 1/2 "	.....	" good; large full fish.
15 miles E.S.E. of Canso	July 29	Variable wind	55	25	32 "	.....	" 40% full.
Mouth of Country Harbour	Aug. 7	Fine	58	33	No herring	.....
10 miles S.E. of Isaacs Hbr.	Aug. 8	Moderate E. wind	57	29	76 mackerel	.....
15 " E. of Canso	" 9	Fine	57	44	" "	.....
Off Green Isle	" 22	Strong N.W. wind	56	25	" "	.....
16 " E. of Canso	" 28	Stiff S.W. breeze	54	32	" "	.....
Antigonish County.							
7 miles off Cape George	July 12	Fresh W. wind. Clear	52	56	155 baskets	.....	Quality very good. 50% large full, 50% full.
7 " " "	" 14	Strong N. wind. Heavy sea	52	56	No herring	.....	" " " fairly large, fat fish, without milt or roe
7 " " "	" 27	Strong N.E. wind	52	24	19 1/2 baskets	.....	" " " large full and full.
7 " " "	Aug. 21	Strong W. wind	57	24	6 "	.....
7 " " "	" 24	Variable wind. Clear	57	32	No herring	.....
Halifax County.							
10 miles off Egg Island	June 15	Variable wind. Clear	52	46	14 baskets	.....	Quality good; mixed, large and medium fat, without milt or roe
8 " off Musquodoboit Light	" 30	Moderate N. wind. Clear	48	40	29 1/2 "	.....	Many dogfish
8 " " "	July 7	Strong S.W. wind. Thick fog	48	40	70 "	.....	Quality poor; 75% extra large and fat; 25% large and fat, without milt or roe. Many dogfish.
19 " S.S.W. of Jeddore Rock	" 29	S.W. wind. Fog	52	42	55 "	.....	Quality good; all large and fat; milt roe forming.
8 " off Jeddore Rock	Aug. 15	" " "	56	35	No herring	.....	" " 50% extra large full; 25% large with roe forming; 25% large empty. Evidence of large body of fish
Off Owl's Head	Aug. 11	" " "	56	9	" "	.....
Sheburne County.							
6 miles E.S.E. of Lockport Light	July 5	East wind. Fog	49	40	4 baskets	.....	Quality good; mixed large full and full Dogfish very abundant

NOTE.—Two baskets equal one barrel of fresh fish

In explanation of the terms used to describe the kind and size of the fish it may be mentioned that in this case "Extra Large Full" represents fish that were full of either milt or roe and measured from 14 to 15½ inches; "Large Full" represents fish that were full of either milt or roe and measured from 12 to 14 inches; "Full" represents fish that were full of either milt or roe and measured from 11 to 12 inches; and "Medium Full" represents fish that were full of milt or roe and measured from 10 to 11 inches. The measurements are from the point of the head to the end of the tail fin in each instance.

For convenience in noting and comparing the composition of the catches the fishing results of each district or county are shown together in the table, beginning with the date on which the nets were first set in the most easterly county or district and not with the date on which fishing first started.

At the outset three sets were made on May 8, 12 and 16, off Guysborough and Richmond counties; but very few herring were caught. Apparently it was too early in the season to find summer herring there. It was decided, therefore, to move east and fish off the shores of Cape Breton and Victoria counties at the southerly edge of the spring schools of the gulf, until the beginning of June.

The spring fish caught there, although all full of milt or roe, and of a somewhat smaller size than the summer fish, were, as was expected, quite devoid of fat.

The north shore of Cape Breton county and eastern shore of Victoria county roughly form a right angle. drift ice had been driven and kept there, until an unusually late date, by continued easterly and north-easterly winds, which interfered with the setting of nets to such an extent that the spring herring fishery, to shore fishermen, was little better than a failure. These conditions also hampered the steamer's operations to some extent. The characteristics of spring herring are so well known that little need be said about them here.

In the beginning of June the steamer returned to the westward, and the first herring of good quality to be landed were got about 12 miles S.S.W. of Whitehead in Guysborough county. Operations were continued during the month between that point and a point 15 miles east of Point Michaux in Richmond county, with the exception of two occasions when the waters off the Jeddore district in Halifax county were tried.

A peculiarity in the composition of the catches taken from the Guysborough and Richmond County waters during June has to be noted. From the 5th to the 9th the fish were large of good quality and full of milt or roe. On the 13th and 14th, 85 per cent of the catch consisted of large and medium fat fish without milt or roe. On the 22nd and 23rd the fish were all fat and without milt or roe.

Then on the 27th and 28th the large fish were full while the medium contained no milt or roe.

The fish taken off the Jeddore district on the 15th and 30th of the month were fat and without milt or roe. In a catch taken from the same fishing grounds on July 7, the fish were found to be all large and fat, with the milt and roe forming, which on the 20th the catch contained 50 per cent of fish that were completely full of milt or roe, 25 per cent in which the milt or roe was forming and 25 per cent without any milt or roe.

One try was made off Lockeport, in Shelburne county, on July 5, and although some full herring were got, operations were discontinued because of the num-

ber of dogfish that happened to be there at that time.

Some difficulty was experienced in locating the fish off Guysborough county during July, and on the 12th the waters of George bay off Antigonish county were tried when the best catch of the season, consisting of fish of excellent quality and all full of milt or roe was made. But, strange to say, on July 27 a catch from the same place consisted of fairly large fat fish without any milt or roe; then a catch on August 21 consisted again of large fish full of milt or roe.

After the month of July the fish seemed to move close in the shore and none could be located during August off shore from Halifax eastward.

Some nets were set at the mouth of Country Harbour on August 7, when fish of good quality and full of milt or roe were taken. The catch made on the 21st in George bay was the only other one landed during August.

As the trade knows, herring were extremely scarce last summer all over the south shore of Nova Scotia: in fact, at most places the fishing could only be characterized as a failure. This made it rather hard for the drifter working alone to follow the movements of the fish. Had there been three or four boats working together they would possibly have kept in touch with the schools right up till spawning time.

There has been too little practical investigation, such as this, carried out as yet along our very extensive coastline to warrant any one making definite statements concerning the distribution of the herring-masses and the localities at which a drift-net fishery might or might not be established. Such accurate knowledge as would be of value to the trade can only be gained, speedily, by the operations of not one boat, but of several—not necessarily steamers—covering a series of years.

The work of the past season, however, would seem to indicate that a drift-net fishery could be successfully prosecuted off the shores of the counties of Halifax, Guysborough and Richmond during June and July at least; and in George bay, Antigonish county, during July and probably August. But, while it is important simply to know where and when herring can be got during summer, it is of much more importance to know exactly where and when fish of the most desirable age and quality may be caught in reasonably large quantities.

Looking at the information given under the heading "Quality and Size" in the record of the steamer's operations, and keeping in mind the measurements of the various classes of fish named, it will be found, by making use of the table on page 19 of Dr. Hjort's Preliminary Report on his Investigations into the Herring in Canadian Waters, that the approximate ages of the fish taken were as follows:

Those caught off the shores of Richmond and Guysborough counties consisted of 70 per cent that were over 10 years old, and 30 per cent that were from 4 to 5 years old. Those caught off the shores of Halifax county were all over 10 years old, with the exception of one catch in the middle of June which was made up of herring over 10 years old and herring from 4 to 5 years old in about equal proportions. Those caught in George bay were from 6 to under 10 years old, except the catch of July 27, which was made up of fish that ran from 6 to over 10 years old.

It will thus be seen that by far the greater proportion of the season's landings consisted of herring that had not only reached but passed the age of 10 years. Now while herring of that age may be perfectly suitable for use as bait, they are much too old and over

grown to suit the requirements of the trade for food purposes, by reason of two facts: (1) that large fish do not retail well; and (2) that the flesh of the larger fish is tougher and not so finely flavoured as that of the smaller ones.

For the Scotch-cured herring trade fish that are from 3 to 6 years old, are wanted; for the split-herring trade the demand is growing greater for medium and being the more delicious, are preferred by consumers.

In the course of my travels the coast last summer I found evidence of the fact that herring of that desirable age do frequent the coast of Nova Scotia.

For instance, early in July I saw herring taken in traps in the Pubnico and Woods Harbour districts, the majority of which were not more than 5 years old and which were either without milt or roe, or just showing the formation of such.

At Lockeport on the 19th of July I saw about 20 barrels of small herring landed that were not more than one year old. At Port Mouton on two occasions in the middle of August I saw a similar quantity of one year old herring landed.

But, at these same places and about the same time I also saw herring landed that were very old and large.

Doubtless there are many other places on the coast where young herring can be found. I know that the Caraquet and Shippegan cod fishermen get young fat herring in the few nets they carry to secure bait when fishing in the gulf off Gloucester county, N.B., in June and July.

The fishing problems that remain to be solved than are:— Where—outside of the Bay of Fundy—can herring that are from 3 to 6 years old be got in large quantities? At what season of the year are they in best condition for commercial purposes? Until these problems are solved progress in building up a herring industry for food purposes on the Atlantic coast will be slow. Dr. Hjort in his interesting and instructive Preliminary Report on the Investigations into the Natural History of the Herring in Canadian Waters, 1914, tells us that scientific investigations off the coast of Norway have resulted in the formation of a general idea that all herrings on the open coast of Norway belong to the same race; that their spawning resort is on the south-western coast, from where the young fry are distributed over the whole length of the coast by the northerly set of the current. These on reaching the age of from 3 to 6 years are known as "Fat Herring" and are taken during summer mainly in the Nordland and Tromso districts in the northern part of the coast. As they begin to fill with milt or roe, they move southwards and mingle with what are known as "Large Herring," which are taken in greatest quantities in the fall off the coast of Romsdal. Finally, they pass to the southwest coast, there to spawn in spring and replenish the northern waters.

From this it would seem that the waters off the Norwegian coast are peculiar in this respect, as no such general movement along shore towards one great spawning centre is found in the western part of the North sea nor on the Atlantic side of the British Isles, and I do not think that any similar movement can be traced in Canadian waters, or that the herring supply is maintained by any one large spawning area, because it is known, definitely, that there are herring schools spawning at points along the whole Atlantic coast from the Bay of Fundy to the Labrador boundary, at about the same time of the year.

From information obtained by interviewing fisher-

men, Dr. Hjort is led to state, at page 11 of the report referred to, that all herring north of a line drawn easterly along the north shore of Cape Breton are spring spawners, and that all herring south of that line are fall spawners.

The fact, however, is that the limit of the inshore spring spawning schools is found as far south as the island of Seatarie on the open Atlantic, and, for all that we yet know to the contrary, may extend to the nearer banks off the whole south and west coast of Nova Scotia.

Anyway this is certain, that north of the Seatarie line and throughout the gulf there are masses of fall spawners, as well as spring spawners; both of which spawn in the same localities, with the difference perhaps that fall spawners do not come so close to the shore as spring spawners. Dr. Hjort possibly secured sufficient quantities of herring during his 1915 investigations to make this clear to him, and his final report may shed more light on the spawning habits and distribution of herring in our waters.

In any case, it may be interesting and useful to review here the results of the fishing operations carried on in the gulf by the steamer **Thirty-three** during the season of 1907.

From May 16 to June 6 off the eastern end of Prince Edward Island; from July 6 to July 20 off the Magdalen islands; and from August 16 to September 12 in Chaleur bay the steamer caught in all 1,670 baskets or 835 barrels.

Of the total 340 barrels were taken off the east end of Prince Edward Island. These were spring spawning fish. About 80 barrels consisted of young fish which would measure about 8 inches; while the balance was made up of fish of the following approximate ages:— 40 per cent were from 6 to 10 years; 40 per cent from 4 to 5 years old; and 20 per cent from 3 to 4 years old, in all of which the milt or roe was fully developed.

From 8 to 30 miles southwards of Entry island, Magdalen islands, 264 barrels were taken during two and a half weeks' fishing, after the spring schools had spawned and the spring fishery had finished. From the 6th to the 13th of July the fish taken were large, fat and without milt or roe. On the 16th and 17th a few were observed to be full of milt, and on the 19th and 20th most of the fish were of milt. These fish would probably have spawned in September. About 75 per cent of the Magdalen Islands fish were over 10 years old; 15 per cent were probably 8 to 9 years old; and 10 per cent were 5 to 6 years old.

The Chaleur Bay operations resulted in 231 barrels being taken. These fish had the roe and milt fully developed, but on August 20th some spent fish were observed, and again on the 27th and 28th. Afterwards full fish were got till September 12th when they spawned and disappeared. About 50 per cent of the herring taken in Chaleur bay were upwards of 10 years old; about 30 per cent were from 6 to 7 years old; and about 20 per cent were from 4 to 5 years old.

Having had a record of the size of the herring taken during 1907 the age was found by using the table on page of Dr. Hjort's preliminary report previously mentioned.

In conclusion I would direct attention to the quantities of mackerel taken in the few mackerel nets carried by the steamer during the past season. These afford substantial evidence that a boat equipped with a full fleet of mackerel drift-nets could secure large quantities of mackerel off the Nova Scotia coast during the month of June.

Canadian Bureau of Information Organized

Canadian Fisheries Association Well Represented at Distinguished Gathering to Promote a Canadian Bureau of Industrial and Commercial Information and Technical Education.



ON the invitation of the Industrial and Educational Press, Limited, a distinguished company, composed of the leaders in educational, scientific, industrial and commercial spheres in Canada, assembled at a Banquet in the University Club, Montreal, on the evening of March 5th.

Some sixty gentlemen accepted the invitation and sat down to an excellent dinner and amidst company entirely free from the frigidity and dignity usually associated with an academic gathering. With the Hon. W. S. Fielding, ex-Minister of Finance, as Chairman of the meeting, the Fishing Industry was well represented by the presence of Mr. S. Y. Wilson, President of the Canadian Fisheries Association; Mr. A. H. Brittain, Vice-President; Mr. J. A. Paulhus, Chairman, Publicity Committee; Mr. W. R. Spooner, Chairman, Transportation Committee; Mr. D. J. Byrne, Past President; Mr. F. W. Wallace, Secretary-Treasurer, and Editor of the "Canadian Fisherman"; Mr. T. Matthews and Mr. W. P. Scott, of Queensport, N.S.—all members of the Canadian Fisheries Association and representing the industry.

Seated at the Chairman's table were Sir William Peterson, K.C.M.G., LL.D., Principal of McGill University; Mr. S. Y. Wilson, President, Canadian Fisheries Association; Dr. Jas. W. Robertson, C.M.G., LL.D., Past President Dominion Educational Association, Ottawa; Dr. A. B. MacCallum, Ph.D., F.R.S., Chairman Advisory Council of Industrial and Scientific Research, Department of Trade and Commerce; Mr. Arthur A. Cole, President, Canadian Mining Institute; Mr. C. Howard Smith, President, Canadian Pulp and Paper Association; Mr. Carl Riordon, Past President, Pulp and Paper Association, and Mr. Horace Chevrier, President, Retail Merchants' Association of Canada.

Other guests were:

Adams, Frank, D., Ph.D., D.Sc., F.R.S., Ex-President Canadian Mining Institute.
 Bacon, Norman H., Hudson Bay Company.
 Bates, John S., Ph.D., President Technical Section Canadian Pulp and Paper Association.
 Bates, Chas. W., Carleton Place, Ont., Vice-President Canadian Textile Institute.
 Bates, Stanley, E., Editor Canadian Textile Journal and Secretary Canadian Textile Institute.
 Beaudry, J. A., Editor Le Prix Courant and Treasurer of Retail Merchants' Association of Canada.
 Bissett, Alex., President Life Officers Association of Canada.
 Black, W. J., Ottawa, Ont., Dominion Commissioner of Agriculture.
 Boyd, Leslie H., K.C., President Union of Canadian Municipalities.
 Brown, Warren G., Secretary Montreal Publicity Association.

Campbell, Roy, Formerly Secretary Canadian Pulp and Paper Association.

Charlton, H. R., Publicity Agent, Grand Trunk Railway.

Christie, A. S., Advertising Manager of Industrial and Educational Press, Limited.

Carruthers, George, Toronto, Ont., President Interlake Tissue Mills, Limited.

Dale, Prof. J. A., M.A., Departments of Education and Commerce, McGill University.

Daniels, G. F., President Canadian Textile Institute.

Daoust, J. A. C., President La Chambre de Commerce.

Dawson, A. O., Member of the Executive Canadian Textile Institute.

Delage, The Hon. Cyrille F., Quebec, Vice-President Dominion Educational Association.

Dennis, J. S., President Canadian Society of Civil Engineers.

Dowe, A. L., Secretary Canadian Pulp and Paper Association.

Drinkwater, Graham, Canadian Fairbanks-Morse Company, Limited.

Fitzsimons, W. P., Industrial Commissioner, Grand Trunk Railway.

Goodwin, W. L., LL.D., Kingston, Ont., Vice-Chairman Society of Chemical Industry.

Harpell, J. J., President Industrial and Educational Press, Limited.

Harrison, F. C., D.Sc., F.R.S.C., Principal Macdonald College.

Hore, Reg. E., M.A., Toronto, Ont., Editor Canadian Mining Journal, and Member of Council Canadian Mining Institute.

Howe, Harrison E., Canadian Representative of Arthur D. Little Company.

Lamb, H. Mortimer, Sec. Canadian Mining Institute.

Lighthall, W. D., K.C., Honorary Secretary-Treasurer Union of Canadian Municipalities.

Lorrain, Leon, Secretary La Chambre de Commerce.

McLeod, Prof. C. H., Secretary Canadian Society of Civil Engineers.

Putman, J. H., LL.D., Ottawa, Ont., Secretary Dominion Educational Association.

Ross, Henry T., Secretary Canadian Bankers' Association.

Ross, R. A., C.E., Member of Honorary Advisory Council of Industrial and Scientific Research, Department of Trade and Commerce.

Ross, H. S., K.C.

Ross, J. C., Associate Editor Journal of Commerce.

Ruttan, Prof. R. F., M.D., Canadian Member of Council, Society of Chemical Industry also member of the Honorary Advisory Council of Industrial and Scientific Research, Department of Trade and Commerce, Canada.

Sexton, Fred. H., Halifax, N.S., Director Technical Education Province of Nova Scotia.

Sherrard, J. H., Past President Canadian Manufacturers' Association.

Stewart, F. W., President Montreal Publicity Association.

Stephenson, J. N., M.S., Editor Pulp and Paper Magazine of Canada.

Timmerman, H. P., Industrial Commissioner Canadian Pacific Railway.

Thompson, W. H., Toronto, Ont., Industrial and Technical Press.

Tombs, Guy, Canadian Northern Railway.

Van Brysell, F.

Webster, T. P., Dominion Textile Company.

Williams, Geo. E., Chairman Executive Committee, Life Underwriters Association of Canada.

Wright, Frederick, Editor Canadian Municipal Journal.

AFTER the toast to The King, the Hon. Mr. Fielding arose and explained that the gathering was a direct result of a visit taken by Mr. J. J. Harpell, President of the Industrial and Educational Press, Ltd., to the Commercial Museum of Philadelphia. The scheme and objects of the Philadelphia Museum had impressed Mr. Harpell with the manifold advantages of a similar organization to take care of the interests of the rapidly developing natural resources and manufactures of Canada.

Mr. Harpell outlined the work of the Commercial Museum of Philadelphia and explained its relation to the resources and industries of the State of Pennsylvania. In Canada, he stated, there was a lack of educational facilities for those desiring to enter special industries and trades; there were insufficient means provided for the distribution of technical knowledge and general information upon our resources and industries, and practically no museums or libraries containing specimens and literature of the products of the Dominion natural and manufactured. The higher education of the workers in our industries presented an acute problem, and a central bureau of information where anyone could procure reliable matter relating to our commerce and industry called for imperative and immediate establishment to combat the accentuated trade struggle after the war.

Prof. J. A. Dale followed by comparing the educational facilities of Canada with other European countries. He pointed out what Germany, Scotland and England did for the technical education of the workers, and the advantages of the Continuation Classes where young men and women were enabled to study the technicalities of their particular industries while they continued at their work. In Germany, he stated, that if there were twenty persons in a town employed in a certain trade, the local authorities would provide means by which these workers would be enabled to study the most approved methods and modern ways in which to develop their particular work. The result was that the German workman was thoroughly practical and up-to-date and kept himself informed of every step in the progress of his industry.

Mr. C. Howard Smith spoke from the viewpoint of the paper manufacturer, and deplored the lack of local educational facilities which would take care of the higher education of the worker. He cited an instance in his own mill when a certain chemical formula failed to give proper results. His foremen struggled with the problem for weeks until, at last, he was forced to seek the advice of Professor Ruttan. The latter

adjusted the trouble in fifteen minutes. Were facilities provided for the technical education of the paper trade workers, such delays and expense would never occur.



SPEAKING for the fishing industry, Mr. S. Y. Wilson, President of the Canadian Fisheries' Association, stated that there was an immense amount of educational and research work needed in the production, packing and curing of fish. The utilization of fish waste, intelligent methods of fish conservation and propagation, and technical education of the fisherman called for extensive and enlightening propaganda. He expressed the hearty co-operation of the Canadian Fishing Industry in the scheme outlined by Mr. Harpell.

Sir William Peterson, Professor McCallum, Dr. Robertson, Mr. Riordon, Mr. Bates, Mr. Chevrier, and others, made strong speeches approving of the movement, and Mr. George Carruthers, President of the Interlake Tissue Mills, moved the following resolution, which was seconded by Mr. D. J. Byrne, Past President of the Canadian Fisheries' Association.

WHEREAS there is need in Canada for some movement calculated to give greater effectiveness to the facilities already provided, and to be provided, by the various government and municipal authorities for the collection and dissemination of industrial and commercial information, and for the promotion of technical education.

AND WHEREAS in the opinion of those present such a movement might arise from a co-ordinate effort on the part of existing technical, trade and professional organizations.

BE IT THEREFOR RESOLVED, that we here present, together with such others as may wish to join us, form ourselves into an organization to be known as the

"CANADIAN BUREAU OF INFORMATION."

The objects of this organization to be as follows:

First: To provide a central Bureau of Information which may eventually be equipped with a library, files and a staff capable of supplying information and advice concerning industrial and commercial matters, particularly those that have to do with domestic production and the domestic and foreign trade of Canada.

Second: To encourage, and where possible, provide for the strengthening of the public libraries, and the libraries of secondary schools, with literature calculated to give their readers an up-to-date and reliable account of the industries, commerce, finances and resources of Canada, as well as a knowledge of the opportunities these spheres offer, and the preparation necessary to take full advantage of them.

Third: To encourage and assist in the establishment of museums for the exhibition of Canadian products and those of other countries that might be produced in Canada, as well as the products of other countries which are necessary to the industry and commerce of Canada.

Fourth: To provide, in so far as possible, and encourage the production of photographs, plates and other reproductions of scenes pertaining to Canadian industries and resources for use in schools and for public lectures.

Fifth: To assist in the establishment of trade and

technical schools, as well as to encourage the people to take fuller advantage of such facilities for education and training.

BE IT FURTHER RESOLVED that the above mentioned "Canadian Bureau of Information" be under the control of a Board of Directors, composed of ten Directors elected annually by the members of the organization, together with the following ex-officio members, or such of them as may wish to act:

The President of the Union of Canadian Municipalities.

The President of the Canadian Manufacturers' Association.

The President of the Canadian Bankers' Association.
The President of the Dominion Educational Association.

The President of the Dominion Educational Association.

The President of the Canadian Mining Institute.

The President of the Canadian Fisheries' Association.

The President of the Canadian Pulp and Paper Association.

The President of the Canadian Textile Institute.

The President of the Retail Merchants' Association of Canada.

The Chairman of the Society of Chemical Industry.

The President of the Canadian Society of Civil Engineers.

A Representative from each of the four principal railway systems.

Together with the President or other Chief Officer of any other Association, Society, or Institute, that the Board of Directors may decide to add from time to time.

The Resolution, as read, received the unanimous approval of the gentlemen present, and the hope was expressed that the scheme would be acted upon as soon as possible.

The present war has had the affect of rousing us from our apathy. The Germans have taught us an object lesson in the power of their own organizations and the lack of our own. The indomitable spirit of the British people and the huge wealth in the Empire's natural resources are all that has saved us from the Prussian machine, and while we have no desire to profit by the revealed vileness of its purpose, yet we have everything to gain by copying their organizations for world power in the betterment of their systems of education and the development of their manufactures and natural resources.

(A booklet, containing the full text of the speeches at the meeting, will be mailed to all members of the Canadian Fisheries' Association. Others in the Fishing Industry will receive a copy on writing this office.—Editor, C. F.)

NATIONAL SERVICE.

Under the authority of the "War Measures Act, 1914", it is required that every male between the ages of 16 and 65 years, residing in Canada, shall fill in and return a National Service Card, within ten days of the receipt thereof.

Any person who has made default in the discharge of this duty is hereby notified that the time for the return of the completed card has been extended until the 31st of March, 1917, and that a National Service Card and addressed envelope may be obtained upon application to the nearest Postmaster.

SOME FISH!

Mr. C. Westway, of the C. P. R. office, Prince Rupert, B.C. was the winner of the huge black cod raffled by "Bill" Shrubshall for the Red Cross. The raffle realized the handsome sum of \$100.75. The fish weighted 150 lb., and was caught by the crew of the halibut schooner "TULADI". It is exactly the same as that brought in by the Borealis of the New England



Fish Company, Vancouver, some weeks ago. The Vancouver fish was denoted to the provincial museum. It has been found that it is one of the species known known as "erilepsis zouifer." Had Bill known that this was its real title, he might have raised \$300.

AROUND AND AROUND

(From the Philadelphia Buletin).

"You waltz beautifully, Mr. Flubdub. Where did you learn?"

"I practiced with a revolving door. I find that better than a chair."

Filming Finny Folk

By ERNEST A. DENCH.

(Author of "Making the Movies".)

You do not see outside the motion picture theatre such an announcement as this: "The Salmon's Revenge, featuring Fishy Finn." The reason is that the starring system has not yet spread to the denizens of the deep.

But there is this to be said in favor of the salmon—or any other fish for that matter—he has a natural aptitude for acting, and had you any doubt at all on this score, "From Egg to Fry" (an appetizing title that!) should have destroyed it. You see the birth of the salmon, his quaint figure at the hatching stage, and the movements of his curious double-barrelled heart. Next a kingfisher darts at a young salmon and devours him, while to relieve the picture of any heaviness, it concluded humorously by showing the salmon seeing the angler fish to "ragtime."

This is a typical example of the kind of picture for which members of the finny tribe are "casted." The sea anemone, trout, shark, cuttle fish, star fish, dog fish, jelly fish, bream, roach, perch, carp, eel and cat fish are among the finny folk who are, or were on the "pay roll" of producers, European ones mainly.

The most skilful marine cinematographer is Jean Henri Fabre, who is ninety-three years old. He has made insect life a life study, and at this ripe age produces marine films at the Paris studios of Pathe Freres with the assistance of his son.

The general method is to construct an observation chamber in a suitable river or lake. This rises a little above the surface so the operator may work safely. He focusses his camera through the clear plate glass window at the side, first closing the entrance. There is sufficient light for photographic purposes, yet the fish below see nothing but a black patch. This makes the fish act without appearing self-conscious.

Not all subjects, however, are produced in the self-same manner, and especially is this true of radio cinematography. I know of a Frenchman who actually succeeded in filming the digestive organs of a trout. This fish was put on restricted diet which included flour, sugar, peptine, sub-nitrate or bismuth and water. For filming purposes he used a table which had a specially constructed slot covered with glass.

The trout, after he had been fed, was placed inside a celluloid envelope which was provided with a glass tube at each end in order to supply the necessary water to keep the trout alive. There was not an inch of extra space in which the trout could move and the top of the envelope was covered with a piece of paraffin paper. This tube was placed in the receptacle under the table, the camera being focussed on the glass and operated by an electric motor. The trout was compelled to fast for two days in this cramped position, the constant flow of fresh water keeping it alive. The subject was filmed at the rate of three feet per hour.

It has been stated that the Williamson Submarine Pictures were the first to be taken under water, but way back in 1912, S. S. Hutchinson, president of the American Film Manufacturing Company, supervised the production of what at that time was considered a wonderful film.

The water around Santa Catalina, California, has the reputation of being as clear as a crystal and the filming party conducted their operations from a glass-bottomed boat. The marine gardens were selected for the purpose and the camera employed was unique in that tiny magnifying glasses were set near the lens in various positions. The glass at the bottom of the boat was an inch thick and among the subjects covered was a young octopus at a depth of fifteen feet.

In the Salisbury Wild Life Pictures the finny tribe were not neglected. The trout was the "featured" fish inasmuch as he ran through the whole gamut of emotions from the spawn to the fully-grown fish, doing his "posing" at the Government hatcheries and distributing stations.

The hardest stunt of all which confronted Mr. Salisbury was filming trout as they jump over the cataract into their spawning place. Quick movements fail to "register" on the film and this stick-at-it-until-you-get-it operator waited for hours for a trout to smote slowly.

U. S. SHIPPING BOARD TAKING PART IN HALIBUT WAR.

Washington, March 7.—The Shipping Board took a hand today in the Federal Government's fight to protect Alaskan fisheries against Canada's Orders-in-Council giving preferential treatment to British Columbian interests. An order forbidding transfer of the American Gas Boat Venture to Canadian register, the Board declared that while the Canadian Regulations apparently often offer tempting inducements for such transfers, they do not in reality give American citizens an opportunity for free competition in the fisheries trade, but rather subject consumers of fish brought into American territory through Canadian ports "to the possibility" of monopolistic price manipulation."

Officials here believe the effect of the Orders-in-Council, if not offset would be to bring the Alaskan fishing fleet operating off Ktechikan under Canadian registry, and its product into the Canadian port of Prince Rupert. Representations made through the British Embassy have failed to secure a modification, and retaliatory legislation framed by the commerce department failed with the adjournment of Congress.

BRITISH IMPORT RESTRICTIONS. Licenses Must be Obtained From the Controller of Import Restrictions in London.

As is now well known, there are many articles which the British Government has declared, for various reasons arising out of the war, shall not be imported into the United Kingdom without a license therefor being granted by the Controller of Import Restrictions, 22 Carlisle Place, Westminster, London, S.W. Such import restrictions, however, were issued with a view to controlling the imports rather than prohibiting them. These British import restrictions apply to British dominions as well as to foreign countries. Applications for permission to import such goods into the United

Kingdom must be made to the Controller of Import Restrictions by the United Kingdom importer.

It has been the practice, however, of the Department of Trade and Commerce at Ottawa to assist Canadian exporters, through the Canadian High Commissioner's office in London, whenever possible in connection with difficulties which have arisen by reason of such British import restrictions.

The Department of Trade and Commerce has no power to grant licenses to import goods into the United Kingdom. It can only assist, and will do so, when the case so justifies it, in presenting the facts to the High Commissioner so that he may endeavor to prevail on the Controller of Import Restrictions to issue a permit for the import of the goods desired.

For all information in connection therewith further application should be made to the Deputy Minister, Department of Trade and Commerce, Ottawa.

TOO MANY GULLS.

There are residents of Maine, and a sizable number of the coast dwellers, who do not approve completely of the bird protection measures passed by the Legislature in recent years. At the present time from various sections of the coast comes a concerted protest against the multiplied nuisance that the gulls are making of themselves.

A few years ago bird enthusiasts, supported by the bulk of the summer colony, secured the passage of a law making a close time on gulls for a long period of years. The picturesque flocks of white sea-gulls, wheeling and darting in the air and over the sea, swooping down to the surface of the water to pounce upon a fish, appealed to the romantic interest in every visitor. Stringent protective measures were adopted, making the shooting of a gull the cause of a stiff fine.

Thus protected from gunshots, gulls have multiplied and become fearless all along the coast. During the last year they have become especially tame. Never before were they known to go so far inland in their quest for food. This Winter, with the shores covered with snow and the bays frozen food has been very scarce. Several Bar Harbor people have found them coming into their hen yards and making themselves very much at home, picking up the food for the hens as if they always had lived there.

From the summer resort of Seal Harbor comes a general protest that the gulls hover around the shores, gathering up every bit of offal, and then fly a mile or two inland to the lake waters of Jordan's Pond, which supplies the town with water, and make their rookeries there, polluting the water supply. Hundreds of gulls are alleged to be there and they cannot be harmed.

Other residents of various parts of Mt. Desert Island claim that the gulls fly to the mountains from the water and strip off every blueberry and every other edible berry, thus ruining a very flourishing industry.

The gull is a natural scavenger and will eat anything. It is one of the sights of the town when the dump scow goes out to sea, to watch the circling swarm of gulls that follow the craft. They number hundreds, and even thousands.

Taken all in all, the gull is proving himself something of a nuisance and Maine coast residents claim is protected altogether too much, at the expense of other and more valuable marine denizens. — Bar Harbor Times.

TRADE INQUIRIES.

The names of the firms making these inquiries, with their addresses, can be obtained only by those especially interested in the respective commodities upon application to: "The Inquiries Branch, The Department of Trade and Commerce, Ottawa," or The Secretary of the Canadian Manufacturers' Association, Toronto, or The Secretary of the Board of Trade at London, Toronto, Hamilton, Kingston, Brandon, Halifax, Montreal, Quebec, St. John, Sherbrooke, Vancouver, Victoria, Winnipeg, Edmonton, Calgary, Saskatoon, Regina, Winnipeg Industrial Bureau, Chambre de Commerce de Montreal and Moncton, N.B.

Please quote the reference number when requesting addresses.

Canadian Exporters' Note.

In view of the fact that the prohibited list of imports into the United Kingdom is subject to change at any time, Canadian exporters should communicate with the Deputy Minister, Department of Trade and Commerce, Ottawa, before making arrangements to ship any of the subjoined articles to the United Kingdom.

Sardines.—There is a large demand in Cuba for sardines, supplies coming chiefly from Norway. Three hundred cases arrived recently from Canada.

606. **Salt fish, wet or dry.**—A Liverpool firm of fish exporters asks for offers of the above.

609. **Canned salmon.**—A London firm who are contractors to the Admiralty are desirous of securing the agency of a Canadian packer of canned salmon.

THE COMPLETE OPTIMIST.

A trawler out of Lunenburg.

His name was Pluck, I mind;

He sailed away on a fishing trip

But left his luck behind.

Six months or more he cruised about,

From Quereau down to Grand,

And when he turned his course to home,

He had no fish to land.

But as he sailed round Battery Point,

He let his pennant fly;

And as he tied up to the wharf

He cheerily did cry:

"We've come home clean as we went out;

We didn't catch a scale;

And we hain't wet an ounce of salt,

But we've had a dam good sail."

—Anonymous.

HADDIE STORED 2½ YEARS.

I do not know if the experiments have ever been tried as to the longest period fish will keep good in refrigeration, says Bow Tow in the Fishing News, but it can be vouched that some smoked finnan haddock, which had been stored for 2½ years, were recently cooked and found to be still in excellent condition. The parcel has been cured for export to South Africa, and, owing to a dispatch sale, had remained in cold storage for the time mentioned. After personally testing the quality by cooking some of the fish, the curer sent the parcel to Glasgow, and, it is stated, received a return of 8s 6d per stone.

Canada's Fisheries for January, 1917

(Furnished by Marine and Fisheries Dept.).

The month of January, especially the latter half of it, was too rough and cold to permit of successful fishing on the Atlantic coast. To the eastward of Canso fishing in the open sea was practically given up except at Petit-de-Grat in Richmond county and Ingonish in Victoria county.

The current lobster fishing season opened on the 15th. of November in Charlotte and St. John counties, N.B. and is now in progress on both sides of the Bay of Fundy, and on the Nova Scotia coast as far eastward as Halifax Harbour has been much retarded by unfavourable weather conditions.

Up to the end of January the total pack was 4,060 cases, while 10,904 cwts. were shipped in shell. During the corresponding period in the preceding year the pack was 8,737 cases and the shipment in shell 25,622 cwts.

The following table shows the quantity of fresh lobsters, together with their value, taken from the opening of the season to the end of January in each of the years from 1913 to 1917.

1913	35,489 cwts.	value	\$421,805
1914	40,303 cwts.	value	\$446,847
1915	26,698 cwts.	value	\$262,641
1916	43,097 cwts.	value	\$521,643
1917	19,026 cwts.	value	\$376,140

The haddock fishery during January this year was about equal to that of the preceding January; but January this year and January last year both gave considerably smaller results, in point of quantity, than the corresponding month in 1915; the shooteing being due in both cases to rough weather.

Notwithstanding scarcity in some districts the outcome of the smelt fishery over all, during the month was above the average for the same month in the last four seasons.

One fisherman was drowned in Yarmouth county N.S.

The weather in the Vancouver Island district of British Columbia was favourable during nearly the whole of the month, and herring fishing was successfully prosecuted; the catch being much greater than that of January last year.

In the northern district stormy weather was experienced in the latter half of the month. The catch of halibut is less than half of that for the preceding January, this is largely owing to scarcity of bait. There were no herring landed in the Prince Rupert district in January this year, nor in January last year.

Summary of the Quantities and Values of all Sea Fish caught and landed in a Fresh or Green State; and an estimate of the Quantities Marketed, or intended to be marketed, fresh, dried, pickled, canned etc., in the WHOLE OF CANADA, for the MONTH of JANUARY, 1917.

Kinds of Fish.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh Dried, Pickled, Canned, etc.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.
	Quantity.	Value. \$		Quantity.	Quantity.	
SALMON, cwts.	5,208	46,851	.....	14,678	117,539	.....
Salmon, used fresh (or frozen) cwts. . . . .	.....	.....	5,123	.....	.....	7,928
Salmon, smoked, cwts. . . . .	.....	.....	50	.....	.....	.....
Salmon, salted, (dry), cwts. . . . .	.....	.....	.....	.....	.....	5,400
LOBSTERS, cwts.	11,460	239,947	.....	18,911	240,838	.....
Lobsters, canned, cases. . . . .	.....	.....	2,868	.....	.....	4,731
Lobsters, shipped in shell, cwts. . . . .	.....	.....	5,722	.....	.....	9,448
COD, cwts.	19,312	69,067	.....	18,073	45,238	.....
Cod, used fresh, cwts. . . . .	.....	.....	13,473	.....	.....	10,769
Cod, smoked, cwts. . . . .	.....	.....	460	.....	.....	.....
Cod, green-salted, cwts. . . . .	.....	.....	354	.....	.....	1,982
Cod, smoked fillets, cwt. . . . .	.....	.....	527	.....	.....	204
Cod, dried, cwts. . . . .	.....	.....	875	.....	.....	910
HADDOCK, cwts.	25,190	91,878	.....	25,923	67,591	.....
Haddock, used fresh, cwts. . . . .	.....	.....	14,498	.....	.....	15,014
Haddock, smoked, cwts. . . . .	.....	.....	4,966	.....	.....	4,962
Haddock, dried, cwts. . . . .	.....	.....	252	.....	.....	327
HAKE AND CUSKS, cwts.	3,621	6,045	.....	3,383	3,568	.....
Hake and Cusk used fresh, cwts. . . . .	.....	.....	1,479	.....	.....	545
Hake and Cusk smoked fillets, cwts. . . . .	.....	.....	109	.....	.....	178
Hake and Cusk, dried, cwts. . . . .	.....	.....	605	.....	.....	768

POLLOCK, cwts.	1,686	3,251	.....	1,309	1,447	.....
Pollock, used fresh, cwts. . . . .	.....	.....	.....	.....	.....	179
Pollock, smoked fillets, cwts. . . . .	.....	.....	81	.....	.....	.....
Pollock, dried, cwts. . . . .	.....	.....	481	.....	.....	377
HERRING, cwts.	63,182	80,790	.....	47,717	61,123	.....
Herring, used fresh, cwts. . . . .	.....	.....	27,797	.....	.....	17,524
Herring canned, cases . . . . .	.....	.....	4,569	.....	.....	.....
Herring, smoked, cwts. . . . .	.....	.....	738	.....	.....	1,760
Herring, dry-salted, cwts. . . . .	.....	.....	16,895	.....	.....	11,420
Herring, pickled, brls. . . . .	.....	.....	250	.....	.....	2,373
Herring, used as bait, brls. . . . .	.....	.....	620	.....	.....	70
HALIBUT, cwts.	10,348	76,534	.....	16,472	89,598	.....
Halibut, used fresh, cwts. . . . .	.....	.....	10,348	.....	.....	16,472
SOLES, cwts.	511	2,091	511	214	1,050	214
FLOUNDERS, cwts.	1,165	1,268	1,165	584	513	584
SKATE, cwts.	220	326	220	172	208	172
SMELTS, cwts.	29,830	239,343	29,830	23,801	139,440	23,801
WHITING, cwts.	14	56	14	47	141	47
TOM COD, cwts.	2,134	2,635	2,134	3,098	2,332	3,098
OCTOPUS, cwts.	27	216	27	11	94	11
OYSTERS, brls.	12	42	12	.....	.....	.....
CLAMS, brls.	3,127	3,784	.....	6,676	8,143	.....
Clams, used fresh, brls. . . . .	.....	.....	2,927	.....	.....	4,336
Clams, canned, cases. . . . .	.....	.....	203	.....	.....	2,340
SCALLOPS, brls.	1,400	3,500	.....	1,004	2,060	2,010
Scallops, shelled, gals. . . . .	.....	.....	2,800	.....	.....	.....
CRABS, COCKLES, &c., cwts.	369	2,244	369	133	591	133
Total value . . . . .	.....	869,868	.....	.....	781,514	.....

THE FISHERMAN.

The fisherman faces the cold and wet,
The troublesome tide and the buffeting breeze.
Hardships and hazards he has to offset
The wages he wrings from the seas.

The banker abroad on the briny deep,
Seeking to harvest that fruitful field,
Where winds uneasy, so seldom sleep,
A skilful hand must wield.

With hearts of hope, with cheerful looks
They rig and bait, they set and haul,
And reap the harvest of the hooks,
From off the tubs of trawl.

But he who would gather the spoil of the sea
Has foes to follow his footsteps oft
Many and mighty and tricky they be
And they live a low and aloft.

The blinding fog, with its clammy hand
And its cloak of confusion, may stealthily creep
Like a thief in the night, and shut out the land
And cover the face of the deep.

How suddenly out of a sky serene
The blinding blizzard, the savage squall
Can gather and grow, then spitting its spleen
Full on the fisherman fall.

A good stout heart and a nerve you need
Not easily daunted, where dangers are rife.
It calls for a tough and rugged breed
To win in the fisherman's life.

(CECIL BOYD).

CUBAN MARKET CONDITIONS.

(Trade and Commerce Bulletin).

The following report of prices ruling at the Havana Product Exchange for the week ended February 16, 1917, has been furnished by Mr. Enrique R. Margarite, S. en C., 66 San Ignacio street, Havana:

A great dullness has been in evidence during this week as a result of the present political events, but in accordance with the official reports published by the local press a prompt settlement is expected.

Fish in Drums.

Importation—

February 11, SS. Mexico, 50 drums.

February 13, SS. Esparta, 271 drums.

Little business has been effected with fish in drums at 10 cents per pound for codfish, 10.50 for haddock and 9.50 for hake.

Codfish in Cases.

Importation—

February 9, SS. Calamares, 100 cases.

February 12, SS. Chalmette, 400 cases.

February 13, SS. Esparta, 1,045 cases.

February 14, SS. Tenadores, 25 cases.

The prices on codfish in cases have fallen off somewhat and sales were made at \$11.50 to \$14.50 per case for that from United States and Canada.

Herrings.

Holdings of bloaters are sustaining a price of \$1.50 per large box.

"That fellow certainly is a dub."

"For why?"

"I told him I bossed my wife, and he went and told her."



Increasing Production for British Markets

Utilize the Bounty to Assist Fishermen With Motor Engines.

By COLIN McKAY, R.N.R., (In England).

Canadian fishing interests should spare no effort to develop the industry and to increase production as much as possible. Apart from business considerations, it is a patriotic duty, for it is certain that in the very near future every ounce of food Canada can send to the mother country will be needed. So far Great Britain has not suffered from lack of food, but prices have steadily increased, and there is a general expectation that a serious situation will begin to develop by spring time. What the authorities think of the prospects is clearly enough indicated by the appointment of a Food Dictator, and the initiation of measures designed to promote production and conserve supplies. Farmers are being urged to increase their activities; city folks are installing pigs in their front gardens; public parks are being plowed up.

The government is assisting the fishing industry to increase production and organize an improved system of distribution; but it is unlikely that the British industry can do anything adequate in the way of making up the shortage. The Admiralty has taken over for naval duties more than 75 per cent of the first class fishing vessels, and more than 50 per cent of the total number of fishermen of all ages, including boys, engaged in the industry. Owing to the demands of the navy, and the necessary restrictions of fishing industries the quantity of fish landed by British fishing vessels is now about 30 per cent of the normal. As a result of these conditions the price of fish in Great Britain is now a little less than 3 times its pre-war average.

Possibly the outlook for the development of a Canadian fresh fish trade with England is not very bright, but the problem could probably be solved, if organized effort were brought to bear. Frozen salmon from B. C. reach England in excellent condition, and find a ready market. At present the British government is building standardized ships, specially designed for food carrying, and some facilities may be provided for carrying frozen fish of various varieties. But there is no reason why Canada should not, if she can increase her supplies, augment her exports of salt and canned fish to England. Hitherto the consumption of salt and canned fish has been confined to rural and out of the way districts, but the time is coming when the people in the great cities will be glad to get salt and canned fish. At present the supply of such commodities in England is very small, and even if the depredations the submarine pirates are checked, the food problem will become more serious as the war goes on, and for some years after the war is over.

No doubt for Canada the chief difficulty is much the same as it is here — the problem of increasing the catch. Even in peace times many Canadian companies were unable to obtain as big a supply as they could readily sell in the home markets for fresh fish. And now that many fishermen have joined the colors the difficulty has no doubt been considerably accentuated. In the circumstances the most obvious method of increasing production is to increase the efficiency of the tools the fishermen work with. That condition could to a considerable extent be assured by adopting the suggestion of the CANADIAN FISHERMAN that the bounty fund should be utilized to assist fishermen to equip their vessels and boats with motor engines. Since the war broke out the British government has been making loans to fishermen for the purpose of enabling them to equip their boats with motor power, and it is reported that the results have been very satisfactory, the fishermen being able to make bigger catches, and out of increased profits, to make unexpectedly large repayments on their loans. At a time when the increase of fish production may be in considerable measure vital to the existence of the Empire it is an interesting question whether or not the interest on the Washington Award—something over \$160,000 yearly—might not be utilized to better advantage than by distributing it in small sums to vessel owners and fishermen. Years ago when the maritime fishing industry was wedded to the truck system, the bounty was in many cases a God-send to the fishermen; it was ready money; sometimes the only ready money the fishermen got out of his calling, if he happened to be in debt when settling day with the first merchant came round. But now when the cash system is more or less the rule, and the fisherman receives larger returns, the bounty has become more or less of a mere bagatelle. Of course the bounty fund belongs to the fishermen; but in these critical times they might very well consider whether a better method of utilizing it ought to be devised. Some winters ago I stood on a wharf in Lockport N. S. listening to a youngster of 20 years, employed on a little schooner with a motor engine, grouching because during the past week he had only made \$25. No doubt the fact that his vessel had auxiliary power wasn't the sole reason why that boy was making money that his father at the same age would never have dreamed of; other conditions favorable to fishermen had developed; but it was one reason, and I don't doubt what the decision of the boy would have been if he had been asked to make a choice between, foregoing his bounty, and leaving the motor vessel to fish on one at the mercy of the winds.



Fish-Cultural Notes

No. 1. Historical.

By J. B. FEILDING, F.Z.S., late President
British Fish Breeders' Association.



FISH culture as we know it today is a very different science from that practiced by the Romans but was none the less considered as necessary to the nation's food supply than we consider it in these enlightened days of scientific discovery. We know that even before the days of the Roman Empire the Chinese practiced the art of artificial propagation of their fisheries, for like many Asiatic races they were and are dependent on fish to a very large extent as a necessary article of diet. The earliest record Chinese fish culturist was Kung in 500 B. C. What processes these early peoples used we do not exactly know but it is not thought that they practiced artificial fecundation but rather contented themselves with stimulating the natural process and carefully protecting the results. We know that they transported fish ova, probably that of the carp principally, but it is not thought that they ever attempted the culture of such valuable species as those of the salmonidae.

Several of the Roman historians have told us how much the fisheries were appreciated and valued by the State and were probably as carefully protected as they are by any modern Government.

Fish culture made very little head-way after the Roman period until the rise and spread of the church which was naturally the source of all learning and the centre of research at that time. There are few old monasteries in England and elsewhere where there were no carp or other fish ponds in which artificially reared fish were grown to maturity. Probably the methods of carp culture as then adopted were similar to those of today. We know that these early fathers kept registers of their brood stock as the well known carp breeders of today but how far they studied the complex subject of feeding we cannot say. Artificial foods were used but as for the relation they bore to nutrition it is doubted if the problem was ever considered. They probably acted on the analogy of the hog who will eat anything whether it carried any nutritive value or not.

Artificial fecundation was, we believe, unknown until the middle of the eighteenth century, about 1770, when an Alsatian by name Jacobi experimented on the first salmonoid as represented by the Brown trout *Salmo trutta var: fario*, sometimes unfortunately known as the German trout, in this country. I do not think Jacobi's experiments were ever recorded in detail, at any rate the art was lost and was not rediscovered until two simple French fishermen of Remiremont by name Gehin and Renny in 1842, artificially impregnated ova the same way that Jacobi had done and after hatching them out planted the little alevins in a tributary of the Moselle.



THE process of artificial impregnation adopted by those early fish culturists was what is known as the wet process. The ova of a ripe female were expressed into a shallow pan of water in which the milt of the male had already been stirred up.

Those early experiments soon got to be known by the French Government and in turn they reached England where it was found that English scientists had also for some few years been following along the lines of Jacobi and had obtained the same results.

Very little progress was made in the artificial cultivation of fish until the year 1856 when Vrascki, a Russian of no mean scientific attainments, discovered the process of dry impregnation. Vrascki was a great reader and careful writer. He had studied all the early works on fish-culture and saw the short comings of his predecessors, none of whom had, he thought, carefully studied the structure of the ovum nor the spermatozoa. With the aid of the microscope and a note book he commenced work and discovered that the wet process was wrong in that it was almost if not quite as wasteful as in wild nature. He noticed how the spermatozoa when thrown into water were extremely active for a minute or two then fell to the bottom of the pan to all intents apparent dead, therefore, he argued that the sooner the spermatozoa reached the micropyle or orifice in the ovum the better for them. With all their active vivacity he felt sure impregnation would take place. Vrascki further discovered that the ova when expelled carried on them sufficient fluid on which the spermatozoa could travel, therefore, if he simply poured the ova in a dry pan and then poured the milt on the ova they would at once impregnate them and have less chance of avoiding the micropyle.

This was indeed a great step forward for by this means he discovered that he was able to impregnate nearly 100% as against 20 to 50 per cent at best by the other process. Vrascki further satisfied himself that it was useless to use any but "ripe" brood fish although former investigators inferred the contrary was possible.

Following Vrascki's results we hear of investigators in all countries taking up this question of artificial impregnation and cultivation of both fresh water and marine fish. Amongst the most prominent were Frank Buckland of the English Fisheries Service, and whom the writer knew well as a boy; Seth Green a native of the United States; also Dr. Garlick, and most prominent of all, Livingston Stone, at one time U. S. Deputy Commissioner of Fisheries.



THE Japanese have of late years been foremost in the economic development of their waters by artificial means. Perhaps such is not to be surprised at. Seeing that they are dependant on their waters for a large portion of their food. Some twenty four years ago, when the writer was in Japan, little was being done along scientific lines, but since then the artificial propagation of both inland and marine fish, and not only that, but the cultivation of algal for isinglass, iodine and potash, the cultivation of shells for the button industry have been taken up vigorously as a Government policy.

Now, as a result of all this research by early workers, it is interesting to enquire what has been done in our

own time and what countries have made the most use of the knowledge already acquired. There is little doubt in the writer's mind that Germany and Japan have made the greatest strides, for they have realized that the proper admixture of practice with science produces the best results when guided by a sound Government authority which appreciates the natural resources of its country and the necessity for adequate research into their value and conservation.

In Germany the writer has visited many large fish farms, that is land devoted entirely to fish breeding, and also land that produces a crop of fish in a seven year rotation as in field crops. In the latter case, of course, the boundaries of the fields are dykes through which water can be turned. Much land of little value such as blow sand, alkali land and such like has been brought under a high state of agricultural cultivation by adopting this system.

The writer visited several times a large farm in northern Hanover consisting originally of blow sand and pine scrub being farmed along these lines. It was a Government Penal Establishment and large crops of fish were taken off this farm, some 2,000 or 3,000 acres in extent.

Extensive tracts of alkali land in the Hungarian Plain are gradually being brought under productive agriculture through fish farming. In a recent report in the International Agric. Institute we are told of the operations of some of the principal fish breeding establishments in this alkaline area; they are interesting as showing the productivity of the soil under proper treatment. The particulars of those areas are:

- 1914 acres produced 176,000 lbs. of fish
- 1050 acres produced 220,000 lbs. of fish
- 262 acres produced 50,600 lbs. of fish
- 889 acres produced 10,000 lbs. of fish

and further after four or five years of fish culture 2,200 lbs. of wheat per acre were taken off the previously submerged land and 403 cwt. of forage, corn, and beets, per acre.

Commencing in the year 1897 the noted German fish culturist, the late Herr Siegfried Jaffe, whom the writer can claim amongst his best friends, began some interesting experiments in order to ascertain what economic crop, either animal or vegetable, was able to extract the most from the soil of a given area.

Being an amateur farmer, a man of considerable scientific attainments and a high Government official in the German inland fisheries, he was able to carry out experiments of this nature under many varied conditions, but unfortunately ill-health and subsequent death cut off the completion of what promised to be some of the most valuable work in soil development ever undertaken.

On many occasions the writer visited some of the locations of these tests and always kept in touch with them until recent years. It was great satisfaction to Herr Jaffe, who was always an enthusiast, to see how well his early conclusions were working out. In other words, he discovered that taking a definite area of land and dividing it up into suitable equal sized blocks, he found that by submerging one block and putting in under fish, he obtained a greater weight of human food per acre per annum than he did by putting it under a field crop or farm live stock.

Water is a great solvent we know, but the curious fact is that it does not appear to impoverish the land to so great an extent, if properly handled in fallow, as land otherwise treated.

It is true that submerged land, if it is to be cropped with fish annually, has to be treated just in the same systematic way as dry land if the utmost is to be extracted from it. Soil acidity becomes a common feature unless carefully watched and stopped in time.

We must all realize that food, be it beast, bird, fish, crustacean or vegetable must originate in the soil, and unless that soil is so treated as to make it give up its necessary salts to the vegetable we cannot expect the maximum production of flesh.

It was this realization that put Herr Jaffe on the track of soil treatment for fish production and made him in Europe the greatest authority on fish culture, during the last thirty or fifty years.

The next step in the history of agriculture has been the wonderful development of the study of the artificial production of our economic clam shells so necessary to the Pearl Button Industry in the United States. The U. S. Government has established a Biological Station at Fairport, Iowa, where very satisfactory results have been obtained, much to the benefit of the manufacturer, and further cultural stations have been erected for introducing those bi-valves into the various tributaries of the Mississippi. We in Canada have a lot of way to make up, but like all young countries we can only afford to go steadily, step by step. We should, however, take all the advantage possible of much of this valuable work of research that has been done and which has cost us nothing.

We have extensive areas of rocky land in Algoma, Thunder Bay, and elsewhere in Canada interspread with small lakes. This land can never be of any agricultural value, however great our eventual population may become, but that land can produce a vast tonnage of fish and therefore food for some one under proper management.

You never see any of those lakes in these rocky areas devoid of vegetation and where you have healthy sub-aquatic vegetation you can produce fish in proportion to the luxuriance or otherwise of the growth of the former. Herr Jaffe's experiments went to prove that land submerged and properly handled can produce anything from 250 lbs. to 1,500 lbs. and upwards of fish per annum per acre.

If this can be done in other countries why should not we in these times of high food cost wake up to the fact that our so-called waste lands, much of them submerged are just as much food producers as our rich pastures in South Ontario or our rich wheat lands on the Prairies.



WE have first to work up an interest in the public mind and make it realize that all the store of knowledge we now have should be applied to practical issues now we are put to it, and produce all the food we can, particularly, such food as demands the least labor to create.

Let us look at a few practical facts. Our Great Lake trout *Cristivomer namaycush*, often wrongly called the salmon trout, is one of our easiest cultivated fish on this side of the Rockies and is perhaps the easiest after the Rainbow Trout, *Salmon iridium* of the Pacific Coast, to bring up under artificial conditions.

It is a hardy fish and though cannibalistic by nature can easily be weaned from that habit if no opportunity is offered it to prey on smaller fish. It is a fish, when grown in those cold Northern waters, that will pack and travel well, and as a result make good cheap fresh food for the people of the interior of this great country who are denied access to cheap marine fish.

In 1913 Prof. Dyche of Kansas University read a paper before the American Fisheries Society, at Boston, in which he described the possibilities of an acre pond on the farm. The experiment, had it been more carefully carried out, would have been exceedingly valuable. I mean by 'carefully' that had fish of a greater economic value been used in the experiment and more care used in counting and weighing. I venture to think it would have attracted greater attention, but the experimental result are given here simply to show the productivity of an acre of sour land, for sour it must have been in view of the fact that it was an old fish pond.

In 1910 the pond was first planted with fish and a few more were added subsequently making a total of about 16,000, weighing about 700 lbs.

The species used were Black Bass, Catfish, Bullheads, Crappie, Goldfish, Carp and similar stagnant water loving types.



IN April of 1913 a total of 26,448 fish were taken out weighing 6,780 lbs. This it will be seen that this old pond under apparently no system of artificial culture produced in three years 6,680 lbs. of fish on a total artificial food supply of 1,400 lbs. consisting of meat and fish offals, corn chop and sundry table scraps.

Had the experiment been carried out in a pond of new ground and no artificial food given it would have been a more valuable experiment for it was along this line the German fish culturists were working. Only natural fish foods should be stimulated for it is by that means the cheapest production can be attained.

Sceptics we will always have with us. Those who disbelieve in the value of fish culture by artificial means as a way of stimulating the productivity of our very over fished waters. Do not let us believe, however, as many tell us, fish culture is the panacea—it can at best only assist nature. The writer has often heard it said in European countries, as well as on this side, that no satisfactory results can ever be attained from the artificial culture or rather incubation of marine fish, but there is growing a general census of opinion that as science progresses many obstacles will be overcome. No good was ever done by condemning a process or a scheme untried. Those of my readers, who, while believing in fish culture as a means of stimulating our inland waters, should study the work being done by Herr G. Dannevig Director of the Marine Hatchery at Flodevig, Norway, on the artificial incubation of the cod as a means of helping to replenish the supply in some of the depleted fiords.

We must carefully watch and follow the results of the many economic biologists studying these fish cultural problems in Europe, Asia and America, and not merely condemn their results as not being applicable to our country. After all, as has been said before all food has a common basic origin. The means of extracting it are many and varied. We in Canada have a valuable heritage in our fisheries. Let us look to it we use it properly, with judgment based on the laws of science and without waste.

(To be continued).

FISH HATCHERY PROPOSED FOR FORT FRANCES, ONT., ON CO-OPERATIVE BASIS.



THE American fishermen, having headquarters at Ranier, Minn., are endeavoring to make arrangements to start a fish hatchery on a co-operative basis at Fort Frances.

The proposition to build a barge on which to install the hatchery apparatus and machinery and when the fish are of sufficient size to tow the barge to the fishing grounds and put them in the lake.

In this work, water must be kept fresh and in circulation all the time and it is the intention to install an electric pump. As Ranier has no electricity, they propose to anchor the barge in the river near Fort Frances shore. They have approached the Fort Frances council for a low rate for electricity and their request is receiving very favorable consideration, the council feeling that in a proposition of this kind the lowest possible rate should be given in order to encourage the work.

It is said that whitefish are of a non-migratory nature and that when put in the lake at one point are inclined to make that locality their habitat. For this reason, would it not be a good move on the part of our Canadian fishermen to follow the example of their American friends. The Ranier men already have a portion of the apparatus purchased and expect to be in readiness when the season opens.

During the past few years there have been frequent agitations raised on both sides of the boundary here, in the Commercial Clubs and Boards of Trade to petition the legislative bodies at Ottawa and St. Paul to secure the passing of legislation to prevent commercial fishing in the waters of Rainy Lake and Lake of the Woods. The purpose of the proposed legislation is that the fish be allowed to increase to such an extent as to make these lakes still more a tourist fisherman's paradise and thus attract more summer tourist business to the lakes. This would take away the means of livelihood of a considerable number of fishermen on both sides of the line and would also take away the business these fishermen leave with the towns in the vicinity of the lakes, which business is of considerable extent, and also take a large quantity of much needed food material off the market.

It is said that a couple of fish hatcheries such as the American fishermen are preparing to install will restore to the lakes more fish than the fishermen would take out and so this step is good business for the fishermen who will profit in both ways—increase of fish and less agitation against commercial fishing.

The Canadian fishermen should get together and petition the proper authorities at Ottawa and Toronto to assist in some such arrangement as the American fishermen are bringing about. The cost would be small and the benefit probably large.

The Honorary Freedom of the Fishmongers' Company of London was conferred on Admiral Jellicoe recently. At the luncheon which accompanied the ceremony, the Admiral made a notable speech on the work of the navy during the war. The men engaged in the fishing industry of Great Britain consider themselves connected with one of the oldest and most honorable professions, and the Fishmongers' Company is one of the most ancient of the famous English Trades' Guilds. We, in Canada, are only beginning to realize that the fish business is not a trade to be ashamed of.

Willis—"Bump has a very up-to-date office".

Gillis—"Yes. He has one of these office systems where you can find just what you want when you don't want it by looking where it wouldn't be if you did want it."—Life.

BRITISH IMPORT RESTRICTIONS MODIFIED.

Mr. Lloyd George's recent "Restriction of Imports" Bill expressed a total embargo on canned lobsters, and a 50 per cent embargo on imports of canned salmon. When the cables first came to Canada, things looked blue for the two industries here. Fortunately for us, Premier Borden and Mr. Hazen, Minister of Marine and Fisheries of Canada, were in London at the time, and they, undoubtedly looked after the interests of our fishermen in the matter.

Reports to hand, are to the effect that all the British Columbia salmon pack will be admitted, and that 50 per cent of the Canadian lobster pack will be allowed for importation.

Half a loaf is better than no bread, in so far as the lobstermen are concerned, and with this modification, they will not be hit so hard. Opportunities in other fisheries are better than ever before, and it will pay the lobster fishermen to go in for boat or vessel fishing this summer. The overseas market and the home market are open for all the fish they can get, and men to catch the fish are badly needed.

EXTENSION OF LOBSTER SEASON WANTED.

The fishermen of Gaspé Country are petitioning the Government for an extension of the lobster fishing season as follows: "Open season from April 20 to July 10; then closed until September 1; then open until October 10 for shipment of live lobsters only. Size limit, 9 inches. Strict liberation of seed and berried lobsters, and each fisherman to be compelled to have a license for fishing lobsters at a small fee, same to be fixed by the government.

No lobster canning to be allowed from Barachois Railway bridge east to Pt. Peters; thence northerly to Point Seches on the Gulf of St. Lawrence, including Gaspé Bay.

If the present law was changed so that lobsters could be shipped during September to October, the trade of Montreal and other towns and cities of Eastern Canada could get lobsters about the whole year round.

Reasons for above stated petition is as follows: For the last few years there has been only one canning establishment on this part of the coast, and the price paid by the canner is not sufficient to encourage the fishermen to prepare for catching lobsters. On the other hand if we had the opportunity of shipping live lobsters during the spring and fall months it would be more remunerative.

He had opened a fish shop, and he ordered a new sign painted, of which he was very proud. It read, "Fresh Fish Sold Here."

"What did you put the word 'fresh' in for?" said his first customer. "You wouldn't sell them if they weren't fresh, would you?"

He painted out the word, leaving just, "Fish Sold Here."

"Why do you say 'here'?" asked his second customer. "You're not selling them elsewhere, are you?"

So he rubbed out the word "here".

"Why use 'Sold'?" asked the next customer. "You're not giving them away, are you?"

So he rubbed out everything but the word "Fish".

A moment later another customer came in.

"I don't see the use of that sign 'Fish' up there" said he, "when you can smell them a mile away." — Tit-Bits.

CARGO OF CODFISH.**Sequel to British Government Embargo on Exports to Greece.**

Before Mr. Justice Laurence, without a jury, at the Liverpool (Eng.) Assizes recently, Arthur Ritchie trading as Thomas Boyd and Co., general merchants, Liverpool, brought an action for breach of contract against G. N. Lionda and Co., of Fenchurch Street, London.

Mr. Procter (instructed by Messrs. Weightman, Pender and Co.) represented the plaintiff, and Mr. Maxwell (instructed by Messrs. Frederick Foss and Sons) appeared for the defendants.

On behalf of the plaintiff, it was stated that in October, 1915, the defendants, in written contracts, agreed to purchase from the plaintiff 250 casks of Labrador codfish. The Government, by an Order in Council, on November 3, prohibited the exportation of codfish to Greece. The fish was left on plaintiff's hands, and on November 26 plaintiff agreed to store the fish at the request of the defendants. On December 6 defendants asked plaintiff to sell the fish for their (defendants') account. The fish was sold by plaintiff in April, but it realised an amount which was less than the price which defendants had agreed to pay the plaintiff, who claimed for £321 19s 8d.

Mr. Procter said the contract was entered into before the Order in Council was made. The fish in question were too large, and they were usually shipped to Catholic countries, and the best season for it was in Lent. This particular consignment of fish was sold by the plaintiff in Spain.

In reply to Mr. Maxwell, plaintiff said he did his best to get rid of the fish before it was sent to Spain, but could not obtain a better price.

Mr. Maxwells for the defendants, remarked that both parties knew quite well that the fish was intended for Greece. When the fish was stored the defendants hoped that the embargo would be lifted within a reasonable time, and that it could be exported to Greece. Plaintiff was instructed not to sell the fish without the defendants' consent, but he did not carry out such instructions.

His Lordship entered judgment for the amount claimed—£321-19-8d. — Fishing News.

MOTOR FISHING BOATS IN JAPAN.

By far the greatest use of the marine internal-combustion engine in Japan (says an American Consular report) is in the fishing trade. As a rule the engines are not used in the fishing boats themselves, but on vessels which visit the small villages in certain districts, collect the fish from the local fishermen, and take them to the cities. The vessels are of Japanese or foreign type, the predominant one being a round-bottomed craft, 40 feet or 50 feet long, with a beam of 12 feet to 15 feet, and a draught of about 3 feet. The engines are usually slow-speed, heavy-duty motors, with one or two cylinders, and from 20 to 50 b.h.p. They are of European or Japanese make, and burn kerosene or producer gas. These engines generally operate three-bladed propellers at the rate of about 400 revolutions per minute, and give the vessel a speed of seven or eight knots per hour. The older models have heated carburettors and are fired by electricity, but the later types use the semi-Diesel system of a hot bulb and fuel injection for vaporisation and ignition.

MONTREAL WHOLESALE FISH MARKETS.

March 6th.

The following are the dates of coming Lenten Fish Days: Wednesday, March 7th; Friday, March 9th; Wednesday, March 14th; Friday, March 16th; Wednesday, March 21st; Friday, March 23rd; Wednesday, March 28th; Friday, March 30th; Wednesday, April 4th; Good Friday, April 6th; Holy Saturday, April 7th.

With meat prices soaring, the fish sales during the present Lenten season should exceed all previous years. Of late, there is an undoubted increase in the general consumption of fish as a food, and it is an absolute certainty that fish will become more popular as a staple article of diet apart from religious prescriptions.

Much of the talk of scarcity in stocks of fish is unfounded. True, there are certain lines which are scarce and high in price, but there are plenty of other varieties of fish which can be had at reasonable prices and in abundance. The retail trade, up to the present, insist in stocking only certain lines of fish and certain sizes. They make no effort to introduce other varieties to the consumer. Excellent sea fish which can be produced easily and at reasonable prices are pollock, hake and cusk. These are all of the codfish family and excellent cooking and eating fish.

There has been considerable difficulty experienced by dealers in procuring their stocks of fish owing to the tie-ups in freight transportation over the railroads. As a consequence, much fish has been brought in by express which makes the cost a little more. Transportation, and not scarcity, is responsible for small supplies and higher prices, but with better weather, this should improve.

The producers report that all classes of Atlantic sea fish are in good supply for the Lenten Season. Haddock is plentiful and prices reasonable. Lobsters (live) are easing up due to better weather and fishing. Frozen halibut is plentiful at from 17 to 18 cents per lb. Some fresh Atlantic halibut coming in, but price is high. The first fresh Pacific halibut of the season will be on the market this week—price from 18 to 20 cents per lb. All kinds of frozen and pickled stocks are getting lower. Bloaters are cheap and in good supply.

The following wholesale prices are quoted to-day:

Fresh Fish:	per lb.	
Pacific Halibut	0.18	0.20
Steak Cod	0.10	0.12
Market Cod	0.08½	
Haddock	0.09½	
Carp	0.10	0.11

Fresh Frozen Sea Fish:

Halibut	0.18	0.20
Mackerel (medium) each		0.20
Mackerel (medium) large		0.20
Salmon, B.C.	0.16	0.18
Salmon, Gaspé	0.18	0.20
Cod, Steak, by express		0.10
Haddock, fancy, by express	0.09	0.10
Smelts, No. 1 and No. 1 large	0.15	0.20

Fresh Frozen Lake Fish:

Lake Trout	0.14	0.15
Whitefish	0.12	0.13
Perch	0.10	0.11
Dore	0.12	0.13

Pike	0.09	0.10
Eels		0.10

Smoked Fish:

Finnan Haddies	0.12	0.13
Finnan Haddies, Finest, Boned		0.15
Finnan Haddie Fillets	0.16	0.18
Digby Herrings, per bundle of 5 boxes		1.00
Smoked Boneless Herring, 10 lb. box		1.40
Kippers, 40s and 50s, per box		2.25

Salted and Pickled Fish.

Herring (Labrador), per bbl.	9.00
Salmon (Labrador), per bbl.	20.00
Salmon (B. C. Red)	16.00
Sea Trout, red and pale, per bbl.	15.00
Green Cod, No. 1, per bbl.	14.00
Mackerel, No. 1, per bbl.	21.00
Salt Eels, per lb.	0.07½
Codfish (Skinless), (100-lb. box)	9.50
Codfish (Boneless), blocks, per lb.	0.10
Codfish, Shredded, 12 lb. box	1.80
Strip Cod, boxes, 30 lb., per lb.	0.15

Shellfish:

Lobsters, medium and large, lb.	0.65
Prawns, Imperial gallon	3.00
Shrimps, Imperial gallon	2.50
Scallops	3.00
Oysters, Selected, per gallon	2.00
Oysters, Ordinary, per gallon	1.50
Oysters, Malpequ�, Choice, per bbl.	13.00
Oysters, Malpequ�, Shell, Ordinary, per bbl.	10.00
Oysters, Cape Cod, Shell, per bbl.	12.00
Clams, medium, per bbl.	8.00

BAY OF ISLANDS SCOTCH PACK.

The following is a list of packers of Scotch herring in Bay of Islands the past season together with quantities receiving the Government brand.

- Thos. J. Power, 39½ brls.
- Mike Basha, 404.
- Joseph Flett, 1560½.
- Farquhar Co., 175½.
- Bay of Islands Co., 575.
- John W. Anderson, 70½.
- Frank Benard, 48½.
- Elias Basha, 910½.
- Alex Dunphey, 426.
- George Corbage, 184.
- George Allan, 171½.
- W. J. O'Brien, 81½.
- George Massey, 438½.
- J. H. Baggs, 709.
- J. T. Thorne, 240.
- C. W. O'Brien, 14½.

HOSPITAL SHIP ON PACIFIC

The steamer Unalga of the Coast Guard Service arrived at Juneau, January 20 and is now on a cruise through the waters of Southeastern Alaska and the Gulf of Alaska for the purpose of rendering medical aid to the crews of American fishing boats.

The Unalga will travel from Sitka to Cape St. Elias and Middleton Island and over Portlock fishing banks. Medical aid may be obtained aboard the vessel in Yakutat when the ship is not cruising over the above routes.

R. G. Dodge, captain United States Coast Survey, is in command of the Unalga.

Pacific Fishermen's Wages Largely Increased

New Schedule of Rates Means Thousands of Dollars on the Annual Halibut Catch—Cod Also Figures Largely.

The increased rates to be paid to fishermen on company-owned fishing vessels under the new schedule that is now in force, will mean a substantial rise in the amount of wages they will receive during the various trips they make to the fishing grounds, says the Vancouver News, but whether this will also mean an increase in the prices paid by consumers does not appear at present to be anything like certain.

Under the new agreement that has just been arrived at between the Deep Sea Fishermen's Union of the Pacific Coast and the companies, the rate paid to the fishermen has been increased from 1½ cents per pound for halibut caught in the summer months, to two cents per pound, and from two cents per pound during the three winter months (December, January and February), to 2½ cents per pound.

The old rate for black cod was 1¼ cents per pound when it was accepted, and this has now been raised to the same price as halibut when the amount of black cod caught exceeds the amount of halibut caught in one fishing venture. Formerly cod was a sort of drug on the market. The fishermen caught cod as well as halibut on the same lines, but the cod was usually thrown back into the sea again. Now, however, the food value of cod is being more and more recognized. Cod is now forming a staple article of diet, and it may therefore be expected that in the future catches of this fish will pay the fishermen as much as halibut.

During 1915 the quantity of halibut caught by British Columbia boats was 27,000,000 lbs. Averaging this for the 12 months, the amount earned by the fishermen during the three winter months (December, January and February), under the old rate of two cents per pound, would work out at something like \$135,000, while under the new rate of 2½ cents per pound it would be \$168,750. In the like manner for the remainder of the year the old rate of 1½ cents per pound would amount to about \$303,750, while the new rate of two cents per pound would be \$405,000.

The figures are not available for last year, but it is estimated that the catch was approximately 35,000,000 pounds. Taking an average of this for the three winter months, the old rate of two cents per pound would amount to \$175,000, while under the new rate of 2½ cents per pound it would be \$218,750. For the remainder of the year the old rate of 1½ cents per pound would amount to \$393,750, while the rate of two cents per pound would work out at about \$25,000.

But all this fish was not caught by the company-owned boats, for there are a large number of private and independent vessels out fishing. The number of steamers employed in the business is estimated at 350, and the men employed total some 4,000. It is reckoned that of the total catch, 50 per cent was caught by company-owned vessels, and it is to these only that the new schedule of rates applies. To arrive at an estimate of the difference in the rates effected by the new schedule it is, therefore necessary to divide the above

figures in half, which would give the approximate gain to the fishermen.

Making a computation on the figures already given, the change would work out as follows: 1915, winter schedule, old rate, \$67,500; new rate, \$84,375. For the remainder of the year, the old rate, \$151,875; new rate, \$202,500.

For 1916, winter schedule, old rate, \$87,500; new rate, \$109,375. For the remainder of the year old rate, \$196,875; new rate, \$262,500.

DECREASE IN BRITISH SEA FISHERIES.

The Board of Agriculture and Fisheries has published the sea fisheries returns for England and Wales for the calendar year.

The total of wet fish—4,244,172 cwt., shows a further and heavy decrease from the already diminished 5,785,233 of 1915, and the serious nature of the falling-off in this important article of food is better appreciated by comparison with the quantity of the catch in 1914 and 1913 as follows:

Fisheries. (Wet Fish Only).

	Quantity. Cwt.	Value. £
1913	16,152,374	10,009,326
1914	10,124,948	7,846,130
1915	5,785,233	7,391,115
1916	4,244,172	7,222,917

As at the same time the value of the 1916 catch, £7,222,917 fell but little short of the 1915 take, £7,391,115, which exceeded it by nearly 30 per cent in quantity, the heavy increase in the price of all fish is apparent.

As regards shell fish, although there was an increase of 6,000,000 oysters over the previous year, the number of others captured fell away considerably, but in the same way the value £325,645, overtopped the £290,406 of 1915.

Comparative Prices at Beginning of 1916 and 1917.

	Large Towns (populations over 50,000).		Small Towns and Villages.		Whole United Kingdom.	
	Jan. 1, 1916.	Jan. 1, 1917.	Jan. 1, 1916.	Jan. 1, 1917.	Jan. 1, 1916.	Jan. 1, 1917.
Beef, British—						
Ribs . . . . .	.37	66	34	62	35	64
Thin flank . . . . .	.51	93	39	74	45	84
Beef, chilled or frozen—						
Ribs . . . . .	.51	90	43	81	47	85
Thin flank . . . . .	.70	107	57	96	63	101
Mutton, British—						
Legs . . . . .	.27	61	28	57	28	59
Breast . . . . .	.48	96	34	73	41	84
Mutton, frozen—						
Legs . . . . .	.45	90	38	83	42	86
Breast . . . . .	.70	127	56	117	63	122
Bacon, streaky . . . . .	.34	60	28	53	31	56
Fish . . . . .	.119	155	75	108	97	131
Flour . . . . .	.46	84	52	93	49	88
Bread . . . . .	.45	79	39	68	42	73
Tea . . . . .	.49	51	48	50	48	51
Sugar, granulated . . . . .	.97	173	89	167	93	170
Milk . . . . .	.30	59	78	54	29	57



Motor Boats Arrest Decline of British Inshore Fisheries



MR. Stephen Reynolds, Inspector of Fisheries lecturing on motor fishing developments to members of the Plymouth Institution (England) recently said that during the last few years nothing short of a motor revolution had been quietly going on, especially in the inshore and intermediate fisheries, says the Fishing News. A few years ago everyone was asking how the decay of the fisheries could be arrested. Now they were asking what expansion was going to happen. He did not know anything that had done more to bring that about in the smaller fisheries than the motor. A few years ago the remarkable thing was the growth of the steam fisheries—the building of bigger boats and fishing further grounds, while the inshore fisheries were gradually declining. The youngsters were not coming on to the smaller fisheries. About that time there was a demand for State aid for maintaining the coastal population, and it ended by the Harmsworth Committee, of which he was a member, going around the West country. As they went round they got more and more depressed, and when they got to West Cornwall were too sick and raw to talk about the fisheries. A State experiment was made, a grant of £4000 being given, and the fishermen were enabled to get their money for installing motors through the Fisheries' Society at 3½ per cent., the loan to last for six years. What made the scheme go was the promise that no fisherman would have his dwelling sold up for that debt because he had had bad luck at sea. The boats had been running since two years last August, and there were no arrears. The committee had so many applications that they started a new loan of £2000 out of the repayments. The West Cornwall Fishery Loan Committee in applying for those further loans, said the repayments had been made out of the increased fish caught by the motor boats; out of the quayside price of fish. Hence, from the standpoint of food brought into the country, it may be said that the State, with a returnable loan, had procured for the country a worth of food far in excess of the money lent. In four or five years at most £37,500 worth of motors had gone into Cornwall alone. He supposed the conversion to motor power in Cornwall had been more complete than in any other county, and that was why he had enlarged on Cornish matters. In Devon, Salcombe was about the first to take to motors. Plymouth soon followed suit,

but practically nowhere else were there any installed for some time. On other parts of the English coast motor boats were found in little colonies. An experiment at Beer, a beach port, proved so successful that there were now nearly a dozen motor boats in that Devon village.

The Advantages of the Motor.



MR. REYNOLDS contended that the motor boat gave increased mobility, made for greater regularity of fishing due to sea and also human conditions, and had other advantages. The most important thing it had done, however, was the bringing of the youngsters back into the fishing. The motors were a delightful novelty, and the youngsters who ran the motor were as good as anybody aboard—(laughter). If the youngsters came into the fishing with their motor knowledge, they would launch out in ways that would not be possible to the older people. About 75 per cent. of the first-class fishing boats were on Admiralty service, including all the big steamers, and half the fishermen were gone. Yet the supply of fish had only dropped to approximately 30 per cent., of normal. More dependence had to be placed on the fisheries, and the motors came in time to enable many of the inshore fisheries difference in the amount of fish, as compared with what they would have been able to do with the sailing boats. That was particularly the case in the West country. Fish was dear, but the money paid for it remained in the country. If the available sailing boats in his district had motors installed at a cost of £25,000, and, assuming that they caught only 25 per cent. more fish, the cost would be repaid six times over in the first year. The greatest value of the motor boats was the stopping of the threatened decay in the fishing industry and the renewed activities that it had brought to those communities.

“Do you see anything you like on the bill of fare?”

“How can I judge by reading a printed card? Just tell the waiter to bring it all. Then if I see anything I don't like, I can send it back.” Louisville Courier-Journal.

THE BRITISH SALMON EMBARGO AND THE U.S. CANNING TRADE.

A correspondent of the "Canning Trade" wiring from Seattle, Wash., March 2, says:—

A good deal of real importance to the canned salmon industry of this Coast has developed during the past week. The most important development of the week has been the announcement from England that the Government has decided to cut down the amount of canned salmon that may be imported into the country. The new regulations provide that only 50 per cent. of the quantity of fish imported during 1916 can be shipped into England during the coming year. This order comes as a great surprise to Seattle canned salmon packers, who have felt that the canned salmon that has been imported into England has been to fill a great and urgent demand, and even now some of the packers and brokers here believe that the Government will not shut down on the importations of fish. A very large percentage of the fish packed last year went to England, just as it did the year before. And judging by the inquiries and correspondence that has been in progress for the past few weeks, it was almost a certainty that more fish would be shipped to England out of the 1917 pack than ever before in the history of the industry. Now, with a ruling coming on which may cut down the shipments 50 per cent., there is anything but a cheerful feeling in canned salmon circles, especially in offices where the British business has been the whole thing for a good many months.

Still there is another side to the matter, namely that the general domestic demand is so brisk that it may be heavy enough to absorb the fish that cannot be shipped to England.

SHORTAGE OF SHIPS AND LACK OF SALT DISTRESS NEWFOUNDLAND FISHERIES.

St. Johns, Nfd., March 8.—Newfoundland fish exporters are disturbed over the difficulty of obtaining enough vessels to market their product this year. The fisheries constitute the main industry of the colony and in normal times a large fleet of schooners and small steamers is engaged throughout the autumn and winter in carrying to Europe and South America fish caught in the spring and summer and cured by being pickled and dried in the sun. The vessels trading principally with Portugal, Spain, Italy, and Greece, bring back cargoes of salt from Sicily and Spain.

Until recently the war has not seriously interfered with this trade except for a temporary shutting off the Greek market by the Entente blockade. Since January 1, however, six fish carrying vessels have been torpedoed off the Portuguese coast and in the Mediterranean. Fishing agencies here have purchased all vessels at present available, but as the British Admiralty has requisitioned many steamers formerly used in the trade there is a growing shortage of tonnage.

The trade will require at least 35,000 tons of salt to cure this year's catch of fish. Thus far only enough ships have been secured to bring in 9,000 tons.

Sir Edward Morris, Premier of Newfoundland, who went to England recently to participate in the forthcoming imperial conference, carried with him strong representations from fish merchants and others as to the need of assistance from the Admiralty in solving the problem.

NEWFOUNDLAND MARKET.

Codfish.

Feb. 17th. Merchantable is strong at \$8.40 to \$8.50. The foreign markets are good, but short tonnage and war-risk insurance cut deep into exporters profits. Very little Labrador left. The entire holdings of all qualities in St. John's is about 100,000 quintals, and most of this is the quality suitable for the Brazil market.

Cod-oil.

Common cod oil is holding up to \$182.00 and \$182.50 per tun in St. John's. The holdings are now very low, and there are only two firms who sold considerable stocks waiting for \$190.00 offers, which are expected to come before next May. Refined oil is gone below the dollar limit, and 95 cents is the best offer this week.

Herring.

Split herring, which are not plentiful in the market if well-packed and ready for foreign shipment, can now command \$5.00 a barrel. Stock pack fetch about \$9.00 in St. John's, and \$8.00 to \$8.50 on the coast. There are not more than 10,000 barrels altogether in store here at the present time. There is no danger of a slump if the owners use their own natural cold storage, and send out to New York by small shipments.

Lobsters.

Only a few cases remain unshipped in the city, and as far as we can learn there are none held over in the outports. The price here to-day is \$19.00, and next season will probably be \$20.00. This better price is likely to result in more packers taking up the business next summer. The grounds have had a rest in many parts of the coast since 1914, and it is believed that a favorable result will be noticeable next season.

The North Sydney Herald learns that an offer was recently made by the Leonard Fisheries Company, owners of the largest fish plant in Canada, at Port Hawkesbury, for the purchase of the business block, shipping piers and fish plant of the Moultons, at the head of Regent street. The amount offered however, was not quite up to the price asked, and the deal is off, at least for the present. Later the Hawkesbury plant owners, composed chiefly of Halifax people, made a proposition to Mr. J. A. Farquhar, owner of the large and valuable water front and business site adjoining the North Sydney Herald building, with a view to erecting a shipping pier close to the railway terminus for the purpose of facilitating the quick transportation of fresh fish. What success had attended their efforts is not yet known; but should the deal go through a large cold storage plant is likely to be erected on the Farquhar property, in addition to wharves and other necessary buildings.

"What was the slip?" was the natural question.

"It was a slip of the pen," he said. "In filling in a death certificate for a patient who had died I absent mindedly signed my name in the space, 'Cause of death.'"

EXPORT OF CANADIAN FALL SALMON TO BE RESTRICTED.

Measures will shortly be put into effect by the Canadian Government which will practically prevent the export of what is known at British Columbia "fall salmon" to the United States. During the past season there has been a large export of fall salmon from Canada to the United States, in which country the product has been canned and sold at British Columbia salmon packed in Puget Sound.

As a matter of fact the salmon was not allowed to be canned in Canada at all, as it was considered that at the time of year it would not be in sufficiently good condition. Protests were made to the Marine and Fisheries Department by Canadian canners and as a result the government will frame regulations increasing the size of the mesh of nets after September 15, when the fish commence to become poor. This will prevent the salmon being caught at all where nets are used.

From those portions of the coast where the fish are caught in drag seines the export of salmon taken after September will not be allowed. An exception will be made in favor of fish of good condition exported in 200-pound boxes.

CATCHING FISH BY ELECTRIC LIGHTS AND SUCTION.

Popular Science Magazine describes a new fishing device.

"The fish of the deep are getting wiser, if one can take the numerous devices invented for their capture as a criterion. One of the most recent of these is an apparatus for enticing the fish into a net and then drawing them up through a pipe to a container on deck. C. P. Droz, of Nilversun, Holland, is the inventor.

The apparatus comprises a suction pipe connected with a centrifugal pump, a source of light such as an enclosed electric lamp placed in front of the suction opening, and a funnel-shaped net so arranged as to guide the fish to the suction opening. The fish, seeing the light, enter the net, approach the suction opening and are drawn through the pipe and delivered to a container on deck.

Steel hoops brace the net and strengthen it so that it retains its shape in spite of the action of the waves.

The net is secured at its rear end to the suction pipe and at its front end to a frame pivotally suspended from the boat, so that the net can be removed from the pipe raised together with the frame.

There is a recess made in the boat into which the pipe may be raised and stored away when it is not in use."

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Head Office: 295 Queen Street West Toronto. Boat Factory: Kingston, Ont.

We are exclusive agents for the best Marine Engines known—money refunded with bonus if not satisfied. 16-ft. Launch, complete, \$205; 18-ft. Motor Boat, \$260; 22-ft. Runabout, \$320. Order early.



1. Aux. Yawl, 30x10x2. Sleep 6. Heavy built, make good fishing boat, only \$405.00, Toronto.



19. Glass-cabin Cruiser, 45x9, motor 4 cyl., cabin, cockpit, engine room, \$830 Toronto.



3. Passenger steamer, 60 x 14 x 4, speed 10, \$2,000, f.o.b. Ontario.

70. Steam Yacht, 90x15 x7.6, 2 cabins, saloon, 5 staterooms, speed 16, \$15,000 Toronto.



22. Steam Yacht, 56x10.6x4.6, strongly built, late Dominion Government Patrol boat. Two boats, roomy, well equipped. Trade for real estate. \$3,500, Toronto.

\$75 for this splendid Out-board Motor, Battery Type, Toronto. Magneto Type, \$90. Don't Delay. Order Today.



HERE ARE SOME SECOND-HAND MARINE ENGINES FOR SALE OR EXCHANGE.

- 7. Sterling, high speed 8 cyl., 200 h.p., Bosch equipped, \$1,500, U. S.
- 8. St. Lawrence Unit Engine Plant, 20 h.p., 3 cyl., outfit, \$175, Ontario.
- 9. Adams, 4 h.p., M. & B. Ignition, coil, carburetor, \$60, Ont.

- 10. Evinrude outboard motor, magneto ignition, reversing, \$85, Ont.
- 11. Buck, 4 cyl., 1 cye., 60 h.p., Splitdorf mag. ignition, \$185, Ont.
- 12. Southam, 3 cyl., 4 cye., 9 h.p., reverse gear, rear starter, \$110, Ont.

- 13. Speedway, 6 cyl., 4 cye., 40 h.p. unit plant with gear, \$500, Ont.
- 14. Auto Marine, 3 1/2 h.p., carburetor, coil, timer, etc., \$40, U. S.
- 15. Palmer, 6 h.p., 2 cye., M. & B. Ignition coil, carburetor, \$60, U. S.



ONTARIO Department of Game and Fisheries

The attention of the fishermen is invited to the following provisions of the Dominion Special Fishery Regulations for the Province of Ontario and of the Ontario Game and Fisheries Act.

Fishing by means other than angling or trolling except under the authority of a lease, license or permit issued by this Department is prohibited.

Non-residents, that is persons domiciled in the Province for a period of less than six months, are not allowed to angle or troll without an angler's permit.

No one shall fish for or take large mouthed or small mouthed black bass, maskinonge, speckled trout, brown trout, rainbow or other Pacific trouts, otherwise than by angling.

No one shall fish for large mouthed or small mouthed black bass, maskinonge, salmon, speckled trout, brown trout, rainbow or other Pacific trouts through the ice.

The sale or export of small or large mouthed black bass, of maskinonge and of speckled trout, brown trout, rainbow or other Pacific trouts is prohibited.

The sale or export of pickerel (dore) less than fifteen inches in length, measuring from the point of the nose to the centre of the posterior margin of the tail, is prohibited.

The taking of whitefish or salmon trout less than two pounds in weight is prohibited.

The use of trap nets is prohibited.

Fishing with gill nets in Lake Erie, from December 15th to March 15th, both days inclusive, is prohibited.

No one shall set or place nets other than hoop nets, dip or roll nets, in any river or creek or within five hundred yards of the entrance thereto. This prohibition shall not apply to carp fishing.

CLOSE SEASONS (Commercial Fish.)

Pickerel.—In water other than the Great Lakes, Georgian Bay, North Channel and connecting waters—April 15th to June 15th.

Whitefish and Salmon Trout.—In waters where commercial fishing with gill nets is not permitted—October 5th to November 5th, both days inclusive.

In the Bay of Quinte—November 1st to November 30th, both days inclusive.

In waters other than the Bay of Quinte, Great Lakes, Georgian Bay, North Channel and connecting waters, where commercial fishing with gill nets is permitted—October 5th to November 30th, both days inclusive.

LIMIT OF CATCH (Commercial Fish.)

(By Angling or Trolling.)

Pickerel.—Twelve per day.

Salmon Trout.—Big and Little Rideau Lakes, three per day. Other waters except Great Lakes, Georgian Bay, North Channel and connecting waters, five per day.

A. SHERIFF,

Deputy Minister of Game and Fisheries.

Department of Game and Fisheries.

Toronto, Feb. 1st., 1916.

Exceptional Angling Opportunities

are offered by the Province of Quebec, which is the only one that leases exclusive hunting and fishing territories over large areas of forest, lakes and rivers, both to Clubs and private individuals, with the privilege of erecting camps thereon.

Membership may be obtained, if desired, in many existing clubs, with camp privileges already provided, and often with the right of erecting private summer homes on suitable sites on the club territory.

On all unleased Crown Lands and Waters, angling and hunting are absolutely free to residents of the Province, and the only charge to non-residents is the cost of the non-resident fishing or hunting license.

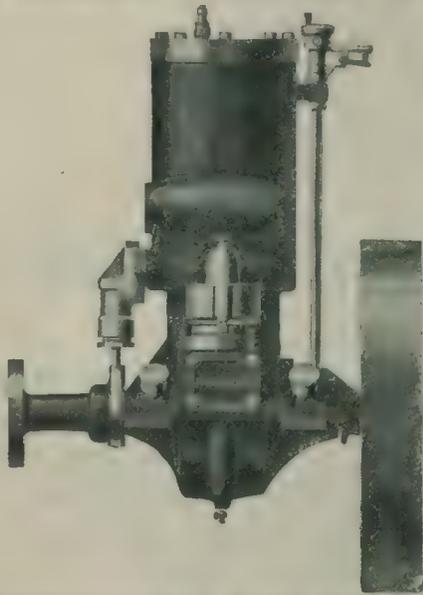
To the Wholesale Fish Trade

The attention of dealers who receive their fresh fish from Portland and other foreign sources is directed to the exceptional opportunities of obtaining their supply from the Baie des Chaleurs and the North Shore of the St. Lawrence, to their own advantage and that of their customers, and to the benefit of the fishermen of the Province of Quebec.

For all information apply to—

**The Minister
of Colonization, Mines and
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Of the Province of Quebec**

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Proceeds of this stock are for war purposes only.

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For application forms apply to the Deputy Minister of Finance, Ottawa.

DEPARTMENT OF FINANCE, OTTAWA
OCTOBER 7th, 1916.

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A copy of *THE SHACK LOCKER* tastefully bound in stiff paper covers will be sent to all new subscribers to the *CANADIAN FISHERMAN* for \$1.50. For one dollar and fifty cents, a paper bound copy of *THE SHACK LOCKER* will be sent along with a year’s subscription to the *CANADIAN FISHERMAN* — the Journal that is putting Canada’s Fisheries on the Map.

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THREE FATHOM HARBOR AND VICINITY.

By MARGARET McLAREN.

The colonies of fishermen who operate at Three Fathom Harbor, The Grève, Seaforth, Maisonneuve's Cove (a local name) are independent of all the world, because they fish with their own gear, boats, etc. and market their fish to suit themselves. As their number is close on three hundred, their takings from the sea amount to a great deal, during the season. Season of course with these people does not include the Winter because, owing their own homes, and fishing gear, they can haul up the boats when "old Boreas" begins to riot round the little grey shanties where the men have spent the Summer months. The gear is stowed away, and the various beaches are deserted and lonely, their usual occupants going home to the settlements at Grand Desert, Lower East Chezzetooke, and Seaforth, where the Winter is spent in hauling firewood and the usual work round the little farms.

There are three big fishing schooners owned among these men and these with their owners forming part of their crews, go every year to the fishing grounds round the Magdalen Islands where they remain until their fare is garnered from the sea, and returning, they go to Three Fathoms Harbor where the catch is taken care of, and where the vessels are laid up for the Winter.

The past season has been a very good one and although the prices of things they must buy have soared to what one of them called a "dizzy height", these men say they have nothing to grumble about, because fish brought good prices, and their hope is that prosperity may continue, as it surely would if the Fisheries of Canada were advertised as well as some of the breakfast foods about which there is a poster on every fence that can almost be seen through the fog.

CLAMS

At West Chezzetooke, N.S. there is a large but shallow harbor, whose sandy flats, bared by the vanishing tides each day disclose to view stretches of what may literally be called buried treasure. It is estimated that during the past year about ten thousand dollars worth of clams were gotten out of these flats and sold to be used as bait by the deep sea fisheries. A man, working during ebb tide each day secures three barrels

of the crustaceans, which when shelled, yield one barrel of meat, or bait, for it is called by both names.

The digger, during the season when bait of this sort is being purchased, makes approximately five dollars each day.

This five dollars he calls "clear" money because he has it as a profit after paying for the barrel used, and the salt. Sometimes the purchasing company furnishes both barrel and salt, sending both from Halifax by schooner, in which case the profit is greater.

During the whole year bi-weekly trips are taken to the towns of Halifax and Dartmouth, by a dozen of teams, the owners of which make a good living by the sale of the large, cleanly and succulent clams which they carry, and for which there is always a good market.

The money made by these people is exclusive of that made by the diggers in the bait buying season, but one of them told the writer how many quarts he sold weekly, and on figuring up after making allowances for all necessary expenses, there was a profit of twenty dollars.

The flats in question are an inexhaustible source of supply, and it is a great wonder that there has never been a factory put in operation by some interested person.

ADULTERATION OF COD-LIVER OIL IN NORWAY.

According to an article in the Oil and Color Trade Journal, 50, (1916), 1815, the oils of exotic fishes used for the adulteration of cod-liver oil by some merchants are mostly those obtained from the so-called "coal-fish", "cusk" and haddock. It is asserted that the Lofoten merchants do not practice adulteration during winter fishing, and that the oil then made is extracted exclusively from cods' livers because no other fish is caught at that season there. Chemicals are not used for purposes of adulteration as far as is known, excepting perhaps a very small percentage of sulfuric acid during the steaming process in order to facilitate the extraction of the oil. If cod-liver oil be mixed with oils from the livers of fish skin to the cod (such as mentioned above), the mixture is never more than 10% or less. It is very difficult to prove this adulteration by methods of analysis. Medically pure genuine cod-liver oil is of a bright yellow color with a slight odor only. The adulteration of this oil is said to have started in Norway just about 1900.

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THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, APRIL, 1917

No. 4



Fitting Out for the Summer's Fishing,
Lunenburg, N.S.

The Magazine of the Commercial Fisheries of Canada
and Newfoundland

Increase Production Campaign --- May to November





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Mark of
Quality*

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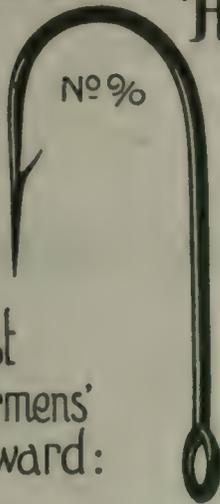
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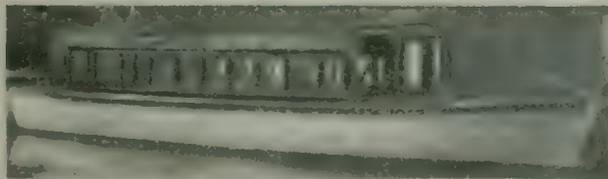


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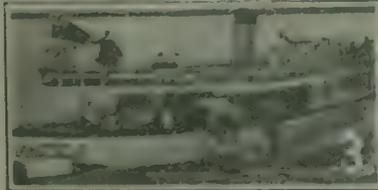
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3. Passenger steamer, 60 x 14 x 4, speed 10, \$2,000, f.o.b. Ontario.

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- 8. St. Lawrence Unit Engine Plant, 20 h.p., 8 cyl., outfit, \$175, Ontario.
- 9. Adams, 4 h.p., M. & B. ignition, coil, carburetor, \$60, Ont.

- 10. Evinrude outboard motor, magneto ignition, reversing, \$85, Ont.
- 11. Buick, 4 cyl., 4 cye., 60 h.p., Split-dorf mag. ignition, \$185, Ont.
- 12. Southam, 8 cyl., 4 cye., 8 h.p., reverse gear, rear starter, \$110, Ont.

- 13. Speedway, 6 cyl., 4 cye., 40 h.p. unit plant with gear, \$500, Ont.
- 14. Auto Marine, 3 1/2 h.p., carburetor, coil, timer, etc., \$40, U. S.
- 15. Palmer, 6 h.p., 2 cye., M. & B. ignition coil, carburetor, \$60, U. S.



Department of The Naval Service

Fisheries Branch

In addition to the full statistics of the Fisheries which are published yearly in the Annual Report, the Department issues monthly bulletins containing statistics of the sea fisheries and general information in regard thereto. Copies of these will be sent free to any applicant.

The value of the Fisheries of Canada is now about \$36,000,000.00 annually.

The demand in the home markets for fresh and mildly cured fish, is expanding very rapidly. The Department pays one-third of the express charges on less than car-load lots on all shipments of such fish from the Atlantic Coast to points as far west as the eastern boundary of Manitoba, and from the Pacific Coast, as far east as this boundary.

Close Seasons for Fish in Force on June 1st, 1916

Kind of Fish:	Nova Scotia.	New Brunswick.	P. E. Island.	Quebec.
Bass (Achigan).....				1 April to 15 June.
Maskinonge.....				15 April to 15 June.
Ouaniche.....				1 Oct. to 30 Nov.
Oysters.....	b1 Jan. to 30 Sept.	b1 Jan. to 30 Sept.	b1 Jan. to 30 Sept.	b1 Jan. to 30 Sept.
Quahaugs.....	Oct. 1 to May 10 & July 1 to Aug 31.	Oct. 1 to May 10 and July 1 to Aug. 31.	Oct. 1 to May 10 and July 1 to Aug 31.	
Pickarel.....				April 15 to May 15.
Salmon (netting).....	Aug 16 to Feb. 28	Aug. 16 to Feb. 28.	Aug. 16 to Feb. 28	Aug. 1 to April 30.
Salmon (angling).....	cAug. 16 to Jan. 31.	Sept 16 to March 31.	Sept. 16 to March 31	Sept. 16 to April 30.
Smelts.....	fApril 1 to July 1.	fMarch 1 to June 30.	fApril 1 to June 30.	April 1 to June 30.
Sturgeon.....		June 1 to July 1.		June 1 to June 30.
Speckled Trout.....	Oct. 1 to March 31.	Oct. 1 to March 31.	Oct. 1 to March 31.	Oct. 1 to April 30.
Salmon Trout.....				Oct. 15 to Dec 1.
Whitefish.....				
Kind of Fish:	Ontario.	Manitoba.	Saskatchewan and Alberta	British Columbia.
Bass (Achigan).....	a1 Jan to 15 June.			
Maskinonge.....	1 Jan. to 15 June.			
Ouaniche.....				
Oysters.....				May 1 to Aug. 31
Quahaugs.....				
Pickarel.....	cApril 15 to May 15.	April 15 to June 20.	dApril 1 to May 15.	
Salmon (netting).....				
Salmon (angling).....				
Smelts.....				See regulations.
Sturgeon.....				
Speckled Trout.....	eSept. 15 to April 30.	Oct. 16 to June 15.	Oct. 16 to June 15.	
Salmon Trout.....	f t. 5 to Nov. 30.			
Whitefish.....	g t. 8 to Nov. 30.	Sept. 15 to Nov. 10.	Sept. 15 to Dec. 15.	

a—Except in Lake Erie west of Pt. Pelee where close season is May 24 to July 15.
 b—Except on leased areas, where close season is from 1 July to 31 Aug.
 c—See regulations.
 d—Except in waters north of or intersected by 54th parallel north lat. between eastern boundary of Saskatchewan, and 109th meridian and in waters intersected by or north of 58th parallel n. lat. west of this meridian to western boundary of Alberta, where there is no close season.

e—Except in Cape Breton Island, where close season is from Sept. 27 to May 31.
 f—Bag-net fishing season Dec. 1 to Feb. 15; gill-net fishing season Oct. 15 to Feb. 15. Licenses required for bag-nets or gill-nets.
 g—For exceptions see regulations.
 h—Except in waters specified in (d) where close season is from 1 Oct. to Nov. 30.
 For British Columbia See Regulations.

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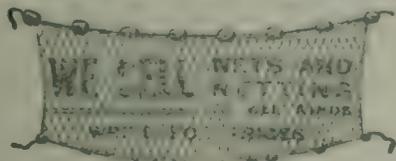
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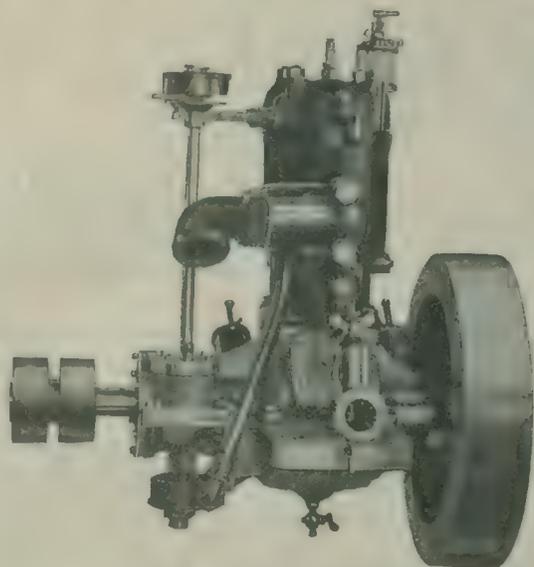
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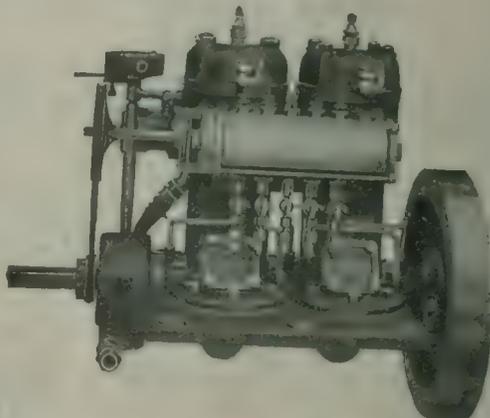
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THE SCIENCE OF THE FISH CULTURE
AND THE USE AND VALUE
- OF FISH PRODUCTS -

F. WILLIAM WALLACE
EDITOR

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Published on the 24th day of each month. Changes of advertisements should be in the publisher's hands ten days before that date. Cuts should be sent by mail, not by express. Readers are cordially invited to send to the Editor items of Fishery news, also articles on subjects of practical interest. If suitable for publication these will be paid for at our regular rates.

Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, APRIL, 1917

No. 4

INCREASE PRODUCTION CAMPAIGN.

The watchword of the present time among those engaged in producing food-stuffs in Canada, is "Increase Production". These two words are the slogan by which we hope to win the war. Increase production in fighting men; in munitions; in shipping; and most vitally, in foodstuffs.

Great Britain, with so many of her food producers engaged in war-work, fighting or manufacturing, and her shipping menaced by the submarine and the mine, needs a constant stream of food for her people and the huge armies on the continent and elsewhere. Canada, her nearest food-producing colony, is looked to for the supplies necessary.

It is up to us here in the Dominion to increase the production of food, not only to supply Great Britain and the men under arms, but also to supply ourselves, since so many of our own men formerly engaged in food production have gone to the front.

In the daily newspapers, much of the Increase Production propaganda has been addressed to the agriculturalist and munition worker. The Fisheries have not been appealed to. That does not mean that increased production in the fishing industry is not necessary. On the contrary, it is a vital necessity, but, this crisis has found our fisheries without any Governmental Department which can adequately make the appeal and reach the producing classes.

The Canadian Fisheries Association, with its affiliations, will shoulder the work of stimulating production of fish, and commencing next month, the Association, through its official organ, the CANADIAN FISHERMAN, will carry on a six month's campaign to increase fish production, not only for the present, but for all time.

The present is the psychological moment in our fisheries. The demand for fish at home has increased greatly; huge orders for overseas are coming in, and our markets in neutral countries and the colonies must be maintained. Many fishermen have enlisted or gone into munitions work and a number of our fishing craft have been sold, chartered for freighting, and a few lost by submarines. Production, therefore, has fallen off, though values have risen.

The entrance of the United States into the War Ring as one of our allies will, in all probability, still further decrease the supply of fish on this continent. Many of their fishing craft will be called up for Naval Service, as will a large number of their fishermen if the U. S. Navy is to be brought to full strength. The United States is one of our best fish markets. As an Ally, we will have to see that our supply to that market is maintained.

We have a big task ahead. Production must be increased to supply the markets, and another duty devolves upon us—that of placing the economical value of fish as a food before the public of Canada in order that living costs may be kept down. The home market

must be built up on a permanent basis, and, if possible, all the war-time markets as well.

The campaign will also be educational, inasmuch as it will give in each issue a comprehensive sketch of just what the fishing industry is in Canada. This, with the increased distribution which will be given these special issues, will bring our fisheries into the limelight and by disseminating knowledge, will attract capital and labour for their development. Articles on improved methods of fishing and the utilization of all our fishery resources will be strongly featured, and will be written in a way that all can understand.

The special issues of the CANADIAN FISHERMAN will have a distribution of at least 10,000 copies per month to fishermen, producers, distributors, retailers, schools, colleges, libraries, consular agents, and the press. Commencing with the May issue, the campaign will run through six numbers of the magazine, and each will be greatly increased in size and will be profusely illustrated with unique drawings and photographs. We aim to put the Canadian Fishing Industry on the highest plane and to give it a publicity never before attempted. With the Canadian Fisheries Association Executive and members, we will put our fisheries "on the map".

INCREASE FISH PRODUCTION CAMPAIGN — MAY TO NOVEMBER. SIX BIG ISSUES OF THE CANADIAN FISHERMAN—THE MAGAZINE THAT IS PUTTING CANADA'S FISHERIES ON THE MAP. IF YOU ARE NOT A SUBSCRIBER, SEND YOUR DOLLAR IN NOW, AND HELP THE GOOD WORK ALONG.

TRADE WITHIN THE EMPIRE.

The following is an extract from a letter received by Mr. D. H. Ross, Canadian Trade Commissioners in Melbourne Australia, from a leading Australian lumber dealer:

"The time has now come when each part of the Empire must and should do its best to help the other and there is no better way of making a success of this than by trading.

"Keep this well before you—while the war is on trade is brisk and men are in constant work, whether at their own special trade or at something else. When the war is over no one knows what will take place and it is for us all to try to make work within our Empire. My suggestion is this, that all timber coming from Canada should be branded at each end with the word 'Canada'.

"I have thought this scheme out for many months and during the last two or three months I have asked various people if Canadian Salmon were branded with the word—Canada—in red across the tin would they always ask for Canadian, and in every instance the reply has been in the affirmative. All this must be worked by a little advertising—it does not cost much. Perhaps twice a week in the prominent part of the paper the words to this effect — 'Support your own people—Order Canadian Salmon'—and I am certain that even an advance of a penny a tin or 1/-per dozen would not stop the people here from ordering. It could be done with so many articles, and I can assure you this, that from the enquiries I have made during the last few months, I am convinced that by branding everything—Canada—there is no need for any preferential duties. I repeat again, what is done must be done **at once**. If you delay America might take your place with branding and advertising."

April Fish Day Calendar

1917		APRIL					1917
Sun.	Mon.	Tue.	Wed.	Thur.	Fri.	Sat.	
1	2	3	4	5	6	7	
8	9	10	11	12	13	14	
15	16	17	18	19	20	21	
22	23	24	25	26	27	28	
29	30						

May Fish Day Calendar

1917		MAY					1917
Sun.	Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	
		1	2	3	4	5	
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31			

EMBER DAY MAY 30TH—EVERY TUESDAY A FISH DAY ALSO.

We heartily endorse this idea, and would strongly recommend that all our fish packers see that their labels, boxes, packages and cans are stamped with the word "CANADA."

THE GRAMAPHONE IN THE FISHING FLEETS.

We are living in an enlightened age and Progress makes her advances in the most unheard of places. She is like an epidemic, and breaks out among persons who are popularly suspected to be immune to her contagion. One of her epidemics is to be found in the spread of the gramophone and phonograph among the fishermen of the offshore fleets.

It is a pretty safe bet nowadays that a fishing vessel doesn't go to sea without a gramophone or phonograph aboard. These instruments are a progressive advance on the sailorman's one time ubiquitous musical instruments—the mouth-organ, accordion and fiddle.

Sailors are all musical. They always were. There is something in the sea which calls up all the music in a man's soul. There is harmony in the whine of the wind in the rigging; the droning of the breeze in the canvas aloft, and the musical mutter of the bow wave. Even in the gale the notes only take on an organ tone. There we have the sonorous boom of the wind in the gear, and the thunderous basso profundo of the surges roaring past. The seaman has always felt the challenge of these sea noises, and in harmony, or defiance of them, he has heaved and hauled and stamped the capstan around bawling out the old deep-sea chanteys of "Away Rio"! "Blow the Man Down"! "Whiskey Johnny"! "On the Plains of Mexico", and so on.

The fiddle was the music of the old sailing Navy. The mouth organ and accordion of the merchant fleet. These have also had their day with the fishermen, but Jack of the Hook and Line has acquired a cultured taste and prefers listening to the humorous ditties of Ada Jones, and the songs, bands, banjo solos, and Hawaiian string orchestras of today from the ship's gramophone or phonograph.

The writer has sailed on at least dozen fishing craft where either of these instruments were as much of an institution as the galley stove or the windlass. As a rule, the instrument was subscribed for and purchased by "all hands" and belonged to the ship. The records were bought in a similar manner. At the conclusion of a good trip, a collection is usually passed around for some new records.

After a day of back-breaking toil, it is certainly soul refreshing to turn into one's bunk, or loll on a locker with pipe alight and listen to a few selections on the gramophone. The music seems to take the "kinks" out of one, and—

"The cares that infest the day
Fold their tents like the Arabs—
And as silently steal away."

But it is in the wearying "lay-offs", when the vessel is bucking some Atlantic howler, hove-to under a fore-sail, that the gramophone is really appreciated. There, is nothing to do in these blows but smoke, eat and sleep. Sometimes they last a long time, but with a gramophone aboard, the time passes quickly and pleasantly.

Chocked on a locker, with someone holding the machine to prevent it rolling off, these instruments will play when the vessel is doing some wild plunging. I've known us jump up from a gramophone concert "down aft", to take in the mainsail, and the strains of "I want to go back to the farm" would come floating up the gangway and make some of us wish to h—l that we were "back on the farm" instead of fisting the wind out of frozen canvas and rolling the big rag up.

Yes! they're a great invention, and fishermen know it. If the manufacturers of these machines never got a testimonial from fishermen before, we'll pass it on now.

PISCATORIAL PARAGRAPHS.

Big catches of fish are reported from Sable Island, better known as Western Bank, of late. The Boston trawlers and the Lunenburg fleet have struck some good catches of haddock, pollock and cod there.

There is likely to be a falling-off in the pack of Maine sardines since the U. S. has entered the war arena. Something like 80 sardine boats from Eastport alone are liable to be impressed as patrols to assist the U.S. Navy.

Several of the Lunenburg fleet have run their first fares in fresh to Halifax and Lockeport. It is a pity that the Lunenburgers do not turn their attention to winter haddocking with their smaller craft instead of laying them up in winter. Supplies would be greatly augmented this way.

Members of the Canadian Fisheries Association can procure a neat silver button-hole badge from the Secretary for the cost—52 cents. There are only a few left.

The steam trawler "Triumph" of the National Fish Company, Ltd., Halifax, N.S., while homeward bound from Western Bank got off her course in a dense fog and took the ground in Lawrencetown Bay to the eastward of Halifax. For two days her position was precarious, but happily, after jettisoning some of her fish, she was lightened enough to be pulled off by tow-boats, and made port with some of her fare. The trawler is slightly damaged, but will continue fishing

after a few days on the slip. The "Triumph," commanded by Captain Mayhre, formerly of the Grimsby trawler "St. Leonard", was one time halibut fishing on the Pacific coast.

Messrs. D. Hatton Company, Ltd., Montreal are rebuilding their offices and warehouse, and are installing a large cold storage plant on their premises. The refrigeration machinery will be supplied by the York Machine Co., York, Pa., through the Canadian Ice Machine Co., Toronto. The National Fish Company of Halifax are also building a large cold storage plant at Hawkesbury, N.S.

In all probability, the entry of the United States into the war will have some effect upon the Fishermen's strike at New England ports. During this critical period in their country's history, a compromise between men and vessel owners and masters should not be difficult.

The American mackerel seining fleet are getting ready for sea—some of the vessels having already sailed for the southern grounds. Others will be late in getting away owing to the strike.

This is the big "fourth year" for salmon on the Fraser River. A record pack is looked for.

A branch of the Canadian Fisheries Association has been formed in British Columbia.

THE FISHERMAN STRIKE.

BOSTON, Mass., April 5.—The fishermen's strike at Boston and Gloucester seems no nearer a settlement, and it looks now as though it had become a question of endurance. The fishermen apparently will not abate their demands, while the committee representing the owners and masters of vessels on Saturday issued a manifesto stating that "they will never arbitrate the question at issue, which means the life or death of the fishing industry." The plan to call a sympathetic strike on the steam trawlers, which are supplying most of the fish for the Boston market, will probably not be carried out. It was expected that the trawler men would quit last Monday in sympathy with the striking crews of the schooners. Instead of striking, the men on the trawlers give 5 per cent. of their wages to the strikers.

WINTER FISHING AT CANSO, N.S.

Notwithstanding the stormy weather of this Winter, the steam trawler Rayond'or has maintained regular weekly landings. For the past four weeks her landings have been 183,000 pounds, 230,000 pounds, 210,000 pounds, and 200,000—almost entirely large haddock and steak cod.

Such successful fishing has not only supplied a ready market, but has given a lot of local employment in handling these large weekly catches.

BIG FOURTH-YEAR FOR SALMON.

All Canneries Will Operate.

This being the "big" year of the four-year cycle in the fishing business, every cannery on the Fraser river that has any equipment will operate says the British Columbian, and a number of them are already commencing to make preparations, particularly those that have not operated since the last big year. There will not, however, be an unusually large number of fishermen on the river this year, probably not more than last, in the opinion of Mr. Martin Monk of New Westminster. One reason is that a lot of fishermen have gone away, while others have taken to forms of employment that promise to be more lucrative than fishing, despite high prices. Mr. Monk hazards the guess that this year no cannery is likely to stake any but experienced fishermen to the necessary equipment, on account of its high cost, a new sockeye net, for instance, costing in the neighborhood of \$175 nowadays, and everything else in proportion. In the good old days, any man that came along and offered to fish could get the gear without question. Mr. Monk recalls that the year he first came to New Westminster, a cannery fitted him out, although he had never seen a fishing net before.

There are but few fishermen on the river at present, and catches are poor, although improving slightly. A few springs and steelheads are being caught. High prices are being paid, springs being worth 12 cents a pound to the fishermen, the highest price on record. The high level is likely to continue, unless there is a really big run of sockeye, and the opening price for the king of salmon will probably be 35 cents.

The hair seal nuisance is particularly rampant at present, fishermen report. Probably owing to the bad weather, the seal are well up river, deserting the stormier waters of the mouth. Especially right opposite the city they are in great numbers, and their annoying habit of taking spring salmon right out of the fishermen's nets is particularly detestable as fish are so scarce. One fisherman reports going out three times without bringing in anything but heads.

DEATH OF COL. WILLIAM BARBOUR.

Col. William Barbour, president of the Linen Thread Company and allied corporations, the American Net & Twine Company, the United States Twine & Net Company, and the Gloucester Net & Twine corporation, died suddenly March 8 in New York. At the time of his death, which was due to heart failure, Col. Barbour was alone in his car, on his way home after spending the day in his office.

Col. Barbour was interested in many important industries besides those mentioned, being a vice-president of the United Shoe Machinery Company and having flax mills in Ireland and in New Jersey. Mr. W. Barbour, manager of the John Leckie Company, Toronto, is a relative.

NEWFOUNDLAND SHIPPING FRESH FISH TO CANADA.

News from St. John's, Nfld., says that the export of frozen codfish from the west coast is a business that is gradually growing every winter since the railway was completed from Portaux Basques. On her last trip the steamer Kyle took over from Port-aux-Basques to North Sydney 550 boxes of frozen cod (300 lbs. each), destined for Toronto, Montreal and other Canadian cities.



Fish-Cultural Notes

No. 2.—Some Fundamental Principles.

By J. B. FEILDING, F.Z.S.,
Late President British Fish Breeders'
Association.



THE science and practice of fish culture as carried on to-day, though much in advance of the nineteenth century, is still in its infancy. There is much to learn, many obstacles, both scientific and practical, to be overcome before we can say that we have raised "aquaculture" to the level of "agriculture."

The principle trouble we have to face is the ignorance of the general public on the source of our food supply, both on land above water, and land below water. To some extent we believe in the necessity of technical education on agriculture. Why not aquaculture?

There is no source of our country's food supply less thought about than our fisheries. There is no source of food production that requires less labor and less capital in proportion to its nutritive value than our fisheries, yet here we are in this twentieth century still groping in the dark complaining of the high cost of living, shortage of labor, scarcity of fresh food, etc., with all this vast area of manipulatable land under water producing food without our assistance. No country has been so richly endowed with natural fishery resources as Canada and it is believed no country realizes it so little—why?

We talk and write volumes on wheat, we draw pictures of and talk about "Canadian apples," from our house tops and yet here is a source of food as rich as the former and vastly more valuable than the latter and we hear nothing of it.

It is possible the answer to these questions is all summed up in the one word "ignorance"—ignorance of the quantity of available fish, ignorance of the varieties that are of economic value, ignorance of the food value, ignorance of the best means of conserving our fisheries, ignorance of the best means of marketing, ignorance of the vast waste connected with the industry amounting to from 40 per cent to 50 per cent of the total weight of our annual catch.

This is the problem before us. If we only realize and will openly admit our ignorance it is easy to learn if we have the desire. How the cultivation of fish to those who have some slight knowledge of the principles of the artificial impregnation of ova, seems at first sight a simple problem and when failure results one is often too ready to blame the water, the apparatus, indeed anything and any person but oneself.

The writer has known instances in Europe and America where the entire output of a hatchery has been lost and the blame put on water pollution when the real cause has never been anything of the kind but has often proved to be due to the neglect of some "fundamental principle" being entirely overlooked by the man in charge.

We are told that it is the sign of a bad workman when that workman complains of his tools, how often this is the case! In order to prove how little water

really has to do with the incubation of fish ova was once proved by the writer by hatching out some 450 Atlantic salmon ova out of a possible 500 on a damp pocket handkerchief laid on a plate in the dining room. Don't think for a moment this is a system recommended for it is not economic nor practicable, but the experiment proved that that particular type of ovum only required moisture enough to hold the free oxygen necessary to its proper embryonic development. In fact, the experiment established one "fundamental principle."

We had previously thought that salmon ova required to be placed in running water and if the current stopped the ova would die almost immediately. The question evolved then was that so long as there is sufficient free oxygen available in the water film enveloping the ovum the latter will develop and hatch out.

This is only one of many fundamental principles, now let us begin at the beginning and study some of the others.



LET us take as our model the principles associated with the artificial propagation of the Atlantic salmon, often called the "King of Fish," or indeed any member of the "genus salmo." Before, however, discussing these fundamentals let it be said that some have yet to be understood scientifically in order that our minds may be set at rest as to whether they are really essential, as for example the fact that our Atlantic salmonoid seems always to be less subject to disease in its early life in the so-called "softer" waters, whereas the opposite is the case with the minor salmonidae of the Pacific slope.

First, in looking for a site for a hatchery it is essential that the water be ample at all times of the year. In order to arrive at the capacity it is necessary to gauge the supply of water during the driest period of the year. The volume necessary to deal with a given quantity of ova depends on its temperature and oxygen holding capacity. In selecting a water supply it is wisest to be on the safe side and select a water supply in excess of the actual requirement.

Secondly, it is well to have two sources of water of different character, namely one of spring origin and the other from a creek. The spring water would be used for incubating, and for such purpose should not vary in temperature more than 3 deg. on either side of 47 deg. Fah. if the best results are to be expected. As soon as there is the least sign of feeding on the part of the alevins, or rather as soon as the yolk sac is about one-quarter absorbed, creek water should be added and increased gradually until such time as the fry are on full feed when spring water may be entirely cut off, unless it is necessary to assist in keeping the temperature of the creek water during feeding in the neighborhood of from 50 deg. to 55 deg. Fah.

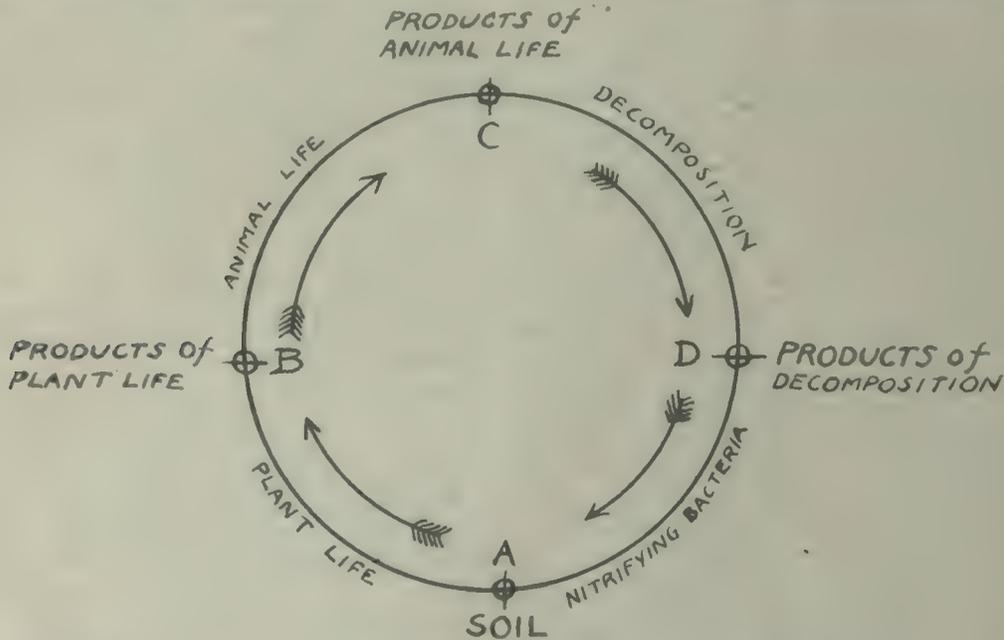
Thirdly, and the most essential fundamental connected with fishculture—that of control. No water supply whatever should be taken on trust. We must have absolute control of the source of our supply or not at all. We must also have entire and undivided control of the supply in transit until it has passed over the eggs or fry. There must be associated with it no means by which any form of pollution can find its way into the system or watershed, be it either a chemical or mechanical pollution. The creek supply should be as little exposed to the sun as possible so as to minimize algal growth of an oxygen consuming character. The spring water supply is best taken entirely in pipes underground from its source and aerated in the hatchery before it passes over the eggs. In this way we maintain the most uniform temperature.

It is essential that the creek water contains as little decomposing, non-aquatic vegetable matter, such as leaves in it, and if possible it is best to encourage the growth of marginal vegetation along the creeks and on the bed of the stream. It is by this means we stimulate the production of entomostraca—the most valuable food for the young of the salmonidae.



IN selecting a creek we must watch carefully that no industrial wastes can find their way in storm water or soakage into our supply and great care should be taken to see that no domestic sewerage, logging bark, sulphite liquor, tannery wastes, spent dye liquor, water gas or coal gas liquors can find their way into the watershed. It has been satisfactorily demonstrated that oxygen saturation is better attained by the water for fish cultural purposes from subaquatic plant life than by agitation. For this reason it is well to cultivate such plants in the creek as give off the most oxygen and do not break up too easily. This for the very good reason that plants detached from the soil and float only generate starch and rapidly decompose and thus use up instead of give off oxygen.

In selecting suitable plant life it is essential to adopt species of quick growing habit rather stunted in growth and succulent. The latter is important since it produces food for univalve mollusca, our most valuable of scavengers. For this reason *Chara fragillis* is not of such value as *Anacharis*, although many fish-culturists recommend it owing to its quick growing



Never select a creek that is subject to flood after heavy rainfall for it is by this means we court disaster through the introduction of land surface washings often carrying toxic elements used in agriculture or street crossings and such like.

We have to be sure also that the waters we use for incubation contain no metallic toxin of any kind, salts of lead; blende, and copper are particularly fatal and with that in view it is best to test the water not only in the laboratory, but also with live fish. Laboratory examinations will often not give us sufficient information particularly where there is decomposition of rock holding some of these minerals.

Unsuitable spring waters are not so common as unsuitable creek waters, but care must be taken. Clearness of the water is no test—no waters having the slightest trace of acidity can be used since fish demand a water if anything slightly alkaline. It must not, however, be inferred that a spring carrying salts of sodium or magnesium can be accepted as suitable but rather water originating in a limestone formation or a stratum of calcareous drift is much to be preferred to any.

Subaquatic plants of the species *Myriophyllum spicatum*—water milfoil, the water tanwort—*Colombis caroliniana*, Canadian water weed—*Anacharis canadensis* and swirl of the pond weeds, genus *Potamogeton* are invaluable, indeed necessary to the production of "healthy" water for fish-cultural purposes.

While on the subject of the fundamental essential of having a healthy growth of subaquatic vegetation perhaps it is as well for us to look into the reasons for it.

We must first in order to fully appreciate the relationship of plant life to animal life we should understand the circle of food production.

A glance at the diagram will assist one to understand this problem. Let us start with the soil. Plant life obtains its food-nitrates, etc., from the soil, while in its turn it gives off oxygen and consumes carbon dioxide, the former essential to fish life, the latter poisonous. The next stage we find is that plant life produces food for micro-life from its albumens, starch and fats, while these in turn provide food for our fish. In course of time fish die and decompose through the action of moulds and bacteria. We thus, in time, have

the products of decomposition, in other words the disintegrated elements which in combination with the soil and nitrifying bacteria form the basic foods of plant life. In touching very briefly on this elementary subject it is only intended to point out certain salient features connected with the relationship of plant to fish life. It must be noted that the plant not only gives off oxygen so necessary to the fish, but also is the indirect basis of food both during the period of its growth and also in the process of decomposition. While alive, the plant is preyed upon by many species of univalve and bivalve mollusca—*Limnea*, *Physa*, *Planorbis*, *Ancylus*, *Pisidium*, etc., while in the process of decay we find Entomostraca of the groups Branchiopods, Ostracods and Copepods feeding on the algae and types of parasitic growth subsisting on the decomposing tissues of the plant. We must not overlook the vast variety of insect life living on this sub-aquatic vegetation which form valuable food for fish, but it should be observed not so valuable as the Mollusca and Entomostraca.



SOME of these insects form food in their larval form, while other in the imago. It is curious, however, that fish do not seem to care and indeed will not eat unless forced such wholly aquatic insects as the Water Boatman—*Notonecta*, *Corixa Nepa*, etc. The principle insects devoured by fish in their larval form are the Phryganeidae, Limnophilidae, Ephemeridae, etc., and these are to be found in almost all "healthy" waters amongst subaquatic vegetation.

In making a careful survey of such waters we would do well to see that they do not contain such predatory creatures as the water mites—Hydrachnidae, the carnivorous water beetles—Dytiscidae. The former if they get into a hatchery play havoc with both ova and alevins, the latter are destructive to ova and fish at almost every stage of development.

The great question of healthy vegetation and animal life in fish raising water as we have seen is an important factor in fish culture for it can be used even when it rises to a higher temperature than water without such conditions. Aquatic vegetation, while living, we see is essential; while in the process of decay it is of value too as food to the lesser forms of fish food.

There are many other questions relating to fish-cultural water supplies of less importance, but space precludes further discussion on the subject.

We now will look into some of the essentials surrounding the utilization of water when it enters the hatchery.

As a rule if the water enters at a suitable temperature we need have little fear of the shortage of available free oxygen. We have dealt with the necessity of two sources of water supply, and the care which has to be taken against mechanical and chemical interference, but we now consider its adaptation to our requirements in fishculture.

First given the conditions referred to, it is not necessary to do more than pass the water perhaps through a flannel filter to protect the ova from the attacks of mites, though to make it doubly sure it has been found that it is safest to use also a charcoal filter as well. It may be said by some that filtration of this type prevents a suitable volume of water being used, but the writer has always found if the water is "healthy" a very much smaller quantity of water is necessary.

The type of hatching trough is a minor detail so long as it is designed so as to carry the maximum of ova in the minimum of space compatible with convenience in extracting dead ova. The hatching troughs are best made of white pine with as few knots as possible, and should be treated in such a way as to sterilize the wood tissue and prevent it assimilating the spores of any of the aquatic fungi such as *Saprolegnia* and *Byssus*. It is true that neither of these parasitic fungi need be feared when incubating healthy ova, but should for any reason the vitality drop, one or other of these fungi is sure to attack the ova unless every precaution is taken. Prevention is always better than cure.

Now there are many methods adopted for the treatment of wood so as to permanently sterilize it, but one system adopted successfully during the past 20 years by the writer is as follows:

Assuming the wood to be dry and well jointed it has been found that a coat of the undermentioned fluids as a preliminary measure is invaluable. First paint the entire woodwork with a saturated solution of sulphate of copper and repeat this three or four times letting it soak in well between each coat. Then when thoroughly dry paint the whole well with lime water. The reason of this is that copper sulphate in the most dilute form is very destructive to all unicellular life, but is soluble in water, the painting with lime water converts into an insoluble element. As soon as the woodwork is thoroughly dry it is well to enamel it with a black enamel. Probably the most widely used black enamel adopted is a preparation of asphaltum made up in the following way:

- Take Syrian Asphaltum 45 lbs.
- Coal Tar Oil 6 gals.
- Litharge 6 lbs.
- Turpentine 25 gals.

Heat the asphaltum to boiling for six hours then take the tar oil also to boiling point and add the litharge gradually while boiling then add the mixture to the asphaltum. When cool add, while stirring, 25 gallons of turpentine. The preparation is best poured while cooling into an old coal oil barrel, then the turpentine can be stirred in well with a paddle without making a mess.



THIS will produce one of the best black enamels on which no parasitic spores can find a hold. It can be easily wiped since the surface is, or should be if properly put on, of a glassy nature. Should the enamel get scratched or chalked the copper sulphate will offer no opportunity to fungal growth. All that will be necessary from year to year if the enamel is not scratched is a sterilization of the trough with weak formaldehyde or permanganate of potash before using.

A hatching trough like everything else in a hatchery cannot be kept too clean for it is a well known fact that if an epidemic should start it is almost impossible to stop it going right through the whole plant.

The question of whether a hatching trough should be covered or not is not of importance, though early fish-culturists maintained they get better results with darkened hatcheries or covered troughs.

We hear the opposite theory in connection with the incubation of white fish and lake herrings though there is no scientific reason for it.

The ova of the brook trout, the rainbow, Atlantic salmon and fish of similar habit all deposit their ova

in shallow water where light can and does penetrate while on the contrary white fish deposit their ova in comparatively deep water during the equinox when the water is turbid so little light can possibly reach the ova. Further when winter comes and ice with snow cover the lakes the ova must be in total darkness for several months. For these reasons it is certain there can be little if anything in the theory that salmon and trout eggs should be incubated in the dark while white fish should be incubated in glass jars with every access to all available light.

In conclusion we think it may be fairly laid down that with a fair knowledge of limnology and the principles of life a careful student may overcome many of the difficulties of fishculture, but fundamentals must be accepted and lived up to for it is no excuse that your ova alevins were lost because your water supply was polluted, was insufficient or the system of delivery broke down, for these must never be possible. Inefficient impregnation, disturbance during transportation, and similar exercises should equally not carry weight. Impregnation should be efficient or it is waste of money and space putting doubtful ova in a hatchery. Ova should always be accompanied during transportation if at all possible, on short one day trips it is not necessary if they are properly packed. As an example of long transportation of ova the writer can testify to the safe travelling of several interesting consignments in which he was associated one consignment for example was shipped from the Trinity River, Oregon, to England, and from thence to Buenos Aires, Argentine Republic; one from England to British East Africa, viz. Suez Canal, one to Kandy, Ceylon, one to New Zealand and so on.

(To be continued.)

FISHING BY TELEPHONE.

A strange way of discovering the whereabouts of fish is practised in some parts of Norway, and the method was discovered by a clever Norwegian. A microphone, which is an instrument that will transmit the slightest sound, is lowered into the water from a fishing-boat and a wire from the microphone is attached to a telephone fixed in the boat. The operator takes the receiver of the telephone and places it to his ear, ready to signal to the fishermen when he hears the least sound beneath the waters, and the fishing-boat is then immediately steered in the direction whence the sounds come. The result is—a splendid haul.

As cod, herrings, and mackerel swim in enormous schools, their passage through the water causes a rushing sound which is clearly heard by the fishermen, who immediately steer in the required direction and let down their nets.

A prominent fisheries firm of Gloucester, Mass., has purchased premises on the south side of St. John's, N. F., and it is understood it is the intention of the company to export both green and dry and boneless cod-fish to the United States, Brazil, and European markets.

KEROSENE AS FUEL FOR GALLEY STOVES.

Kerosene for fuel, replacing coal, has been in constant use in the galley range of the tender "Daisy," of the U. S. Bureau of Lighthouses, since May, 1916, and is said to have been found more satisfactory than coal. The system installed consists of a standard type of oil and air tank as used with vapor lamps, connected to a horizontal oil-engine starting torch. The nozzle of the torch is located just inside of the front door of the fire box of the range, the flame passing through a 2½ by 6¾-in. hole in the front fire brick, and being directed onto a special curved fire brick constructed to deflect the flame up into the top of the fire box. The ordinary stove fire brick is permitted to remain around the side of the fire pot in the usual manner, and false brick is installed above the grate to fill up the space below the burner. From 7 to 10 minutes are required to start the apparatus and heat the stove to a proper temperature for cooking, and a meal can be prepared in about one-fourth the time consumed by the old method using coal. The consumption of kerosene is about one quart per hour, but the burner is not in use more than 3½ hours per day.

SHARKS AS FOOD.

While one of the big steam trawlers was being unloaded at the South Boston fish pier recently, I observed a fisherman cutting up a mammoth shark that was listed in the two days' catch of the crew. This was later taken in a fish cart to one of the stalls.

I learned that it had been disposed of almost as soon as the ship docked to a North End buyer.

"There is a great demand for sharks," a fisherman told me, "in the Italian trade, and they are snapped up as soon as the 'catch' becomes known.

"Dressed for market, I couldn't tell the shark from a sword-fish."—Boston Post.

LIGHTER PACKAGES OF FROZEN SALMON.

Recently, Cold Storage reported one useful outcome of a paper read before the C.S.I.A.—namely, that by Mr. J. M. Tabor, who complained, and other speakers bore witness to the same effect, that frozen salmon was exported from Canada to England in packages too heavy for the requirements of the retailer here, and that there was frequently discrepancy in weights, which militated against the business. An official report of the meeting was communicated to the Dominion Government in Ottawa, by Mr. Harrison Watson, the Canadian Trade Commissioner in London, and the frozen salmon recently to hand came packed in 56 lb. and 112 lb. cases, exact weight.

STEAM TRAWLER LANDS HUGE FARE.

The steam trawler East Hampton, came in at Portland recently with a bumper catch, she having all of 225,000 pounds, of which about 50,000 pounds were cod, the balance haddock. The fish were in prime condition, the majority having been caught within six days, and with the prices now ruling will net a good round sum. The entire catch was taken by the Rundlett-Verrill Co., who have orders booked for practically the whole lot, most of the fish having been taken on the Sable Island grounds.



Another Piscatorial Asset

By REV. P. W. BROWNE.



"WHAT'S in a name?" superciliously asks the Bard of Avon. Did he live in this strenuous age he would realize that a name means a great deal, whether we consider it as an endorsement on a cheque or as a factor in the domain of culinary economics. "Give a dog a bad name and hang him," offsets the Shakespearean quodlibet, for things that have an evil name or reputation must fight for recognition. We again quote the gentle William: "Let Hercules himself do what he may,

The cat will mew, the dog (fish) has his day."

We apologize to the master of poesy for appropriating his verse in this unseemly fashion; we feel justified, however, in taking this liberty, though we do not claim justification for it as does the average poet when he uses "poetic license" as an alibi for metrical and other misfits.

The piscatorial asset that we are going to discuss is the dogfish, which has of late been in the forefront of fishy things; and whilst we are not particularly enthusiastic about the culinary attractiveness of the great marine scavenger there is a good deal to be said regarding the dogfish that is worthy of note.

What is the dogfish? The name is a general one for small sharks given to them apparently because they follow their prey like dogs, hunting in packs; it is synonymous with "hound" and "bonedog." Dogfish, however, is most commonly used to designate members of the family Squalidae, of which the characteristics are—a spine before each of the two dorsal fins; spiracles, or spout holes; five gill openings on each side, all before the pectoral fins. The dogfish is oviparous; the body, long and tapering; the head, flat; the snout, conical, with sharp-edged teeth in both jaws, formed for cutting. It attains a length of 3 to 4 feet and a weight of 10 to 15 pounds. It abounds on both coasts of the North Atlantic, and it is also found in the Mediterranean.

The dogfish has an unenviable record amongst fishermen, especially on the coast of Nova Scotia and in Newfoundland. It has, frequently wrought sad havoc in these sections during the height of the fishing season; and for the past eight or ten years it has been a pest. Nets, bultows, and even lines have been rendered useless by the predations of dogfish, and thousands of dollars have been lost to the fishermen along the eastern seaboard. Some punt fishermen, within the last few years, have actually been obliged to "give up the voyage" owing to the presence of dogfish, along the south coast of Newfoundland.

The Canadian Government have established reduction plants on the Nova Scotian coast in order to induce fishermen to capture dogfish; but from reports these plants have in nowise minimized the pre-
 erment has had the question of inaugurating reduc-

tion plants on the South Coast, presumably in Placentia Bay; but so far nothing has been done.

Fishermen along the Maine Coast, in the United States, have also had trouble with dogfish; and reduction plants do not seem to have solved the difficulty.

The dogfish has of late appeared in a new role. The Federal Bureau of Fisheries of the United States has taken the dogfish under its paternal care, and Dr. H. F. Moore, the director, is pleading its cause. He insists that the dogfish has been unduly abused and that it deserves more respectable treatment at the hands of fishermen than to be ignominiously dumped into the hopper of a reduction plant. The Federal Bureau has even given the dogfish a new name; and henceforth it will be known officially as the "grayfish." Under this appellation it will be caught, prepared and sold; and it is hoped that tens of thousands of cans of dogfish will find their way into the larders of the thrifty housewives who are now face to face with the high cost of living.

American newspapers have lately been devoting considerable space to dissemination of articles dealing with the new piscatorial asset, which, it is claimed, "will knock h--- out of the h.c.l." in western and middle west cities and towns where a fish menu has hitherto been beyond the means of the average purse.

Circulars have been issued by the Bureau of Fisheries giving elaborate data historical and otherwise regarding the "grayfish."

From these circulars we gather that the "grayfish" has been in use on the other side of the Atlantic for many years, that it can be cooked in a variety of ways, that it is a very palatable fish, and that it can be cheaply prepared. Even a comparative analysis has been furnished. It is claimed that grayfish is just as nutritious as salmon; in fact, it has commendatory attributes to which the royal fish dare not lay claim.



THE Bureau says that grayfish is excellent when eaten fresh, and that a market for it in that state has been developed for it in New York City in connection with the tilefish fishery; but it is as a preserved product that it will find its largest use. It can be prepared in a number of ways—salted and dried like cod, smoked and canned in a variety of styles. The smoked fish is excelled by few, if any, products of similar nature, and it is probable that it will be available to the consumer during 1897.

At present the fish is obtainable canned like salmon, and a can containing fourteen ounces of solid meat is purchasable for about ten cents, making it one of the lowest priced fishery products on the market.

We are warned, however, that though the price of the new piscatorial commodity is low, it does not follow that the newly christened dogfish is by any means

"low" either in flavor or in sustaining qualities. Not at all; it is rich, wholesome and generally excellent, so says the Bureau of Fisheries. Furthermore, as it may be cooked in a variety of ways, it should thus prove an important addition to the country's dietary.

The dogfish as an article of food was known eons ago to the people in the Mediterranean, and to the Italians it is known as "the hound," suggested it would seem by the graceful lines of the slim, sleek, body of the fish. Ere the Norsemen thought of invading the fair plains of the country of the Franks, they knew the value of the dogfish; and the Scandinavians to-day have again begun to utilize the scavenger of the deep for food purposes. The Norse are a very economical people, and presumably herring, mackerel, salmon, codfish and other such piscatorial articles are of such value there that they dispose of these and feast off the less costly dogfish!

The canning of dogfish is not by any means a new departure. If memory serves me right an enterprising Newfoundland merchant—Mr. G. C. Fearn, who did a large fish business at Harbor Buffet, in Placentia Bay, put up a quantity of dogfish several years ago and shipped the consignment to England. I have not heard what Mr. Fearn's shipment realized, or whether it ever got beyond the warehouse of the commission merchant in Liverpool to whom it was consigned. As he did not continue the business of canning dogfish, the presumption is that it was not a financial success.



IN the Ancient Colony, the dogfish is used for very plebian purposes, and it ranks with the sculpin and other scavengers as a highly-prized article of food for the canine family!

It does not seem ever to have been refused by the canines, possibly because it has in its name a suggestiveness which makes it acceptable to even such respectable dogs as you find in Newfoundland outports!

To prove their belief in the edibility of dogfish, we are told that the officials of the Bureau of Fisheries at Washington have been testing it personally and having others pass on it for years; some of them are using it in their own households.

In addition to the food properties possessed by the dogfish, a number of by-products are available. The skin is said to be convertible into leather. The roe is useful in the mechanical arts, and the liver is declared to yield a grade of medicinal oil superior to that procured from the vulgar gadus callarias!

The American newspapers that have been boosting the new fish food tell us that it is simply vulgar prejudice which precludes people generally from using dogfish more extensively. They tell us, too, that many other varieties of fish had a reputation equally as unsavory as the dogfish not so long ago; and they instance butterfish and tilefish as having once been regarded as beyond the pale. The use of butterfish has no claim to antiquity, as it came into use not more than a quarter of a century ago. It owes its commercial respectability to a New Jersey skipper who paid twenty-five cents a bushel for his first purchases from Sound fishermen. The tilefish came into use through the activities of the Fishery Bureau of the United States; and it is now a regular feature of the American fish markets. It seems that it is not so long ago that sturgeon came into popular favor; and our old friend the haddock was long winning its way to distinction.

Changes in British Columbia Fishing Regulations



THE delegates appointed by the fishing interests of Northern British Columbia (Fishing District No. 2) comprising the salmon canneries of the Skeena, the Naas, Rivers Inlet, and the outlying districts, together with the halibut banks off Prince Rupert, with the object of obtaining certain alterations in the fishing regulations, have returned from Ottawa and reported that many important changes asked for were granted by the Dominion Fishery Advisory Board. In order to avoid conflict with provincial regulations, it is expected that the changes granted by the Dominion board will be incorporated in the fishing regulations of British Columbia.

Abolition of Boat-Rating Provision.

One of the most important changes was the abolition of the boat-rating provision. In order to safeguard the salmon supply the number of canneries that may be located on a river is limited, and each cannery has been allowed a certain number of boat licenses to supply the catch. These craft are small rowboats manned by one fisherman and an assistant. None except those who were granted licenses have been allowed to fish for salmon in the waters under the supervision of the various canneries. One effect of this rule was that only those fishermen who were in a position to devote all their time during the canning season to salmon fishing were granted licenses. The man who owned a boat and was able to fish for salmon only part of the season could not get a license and was not allowed to take salmon for commercial purposes at all.

The abolition of the rowboat rating among the canneries has produced a change. The new order means that hereafter licenses will not be apportioned to the canneries and distributed by them, but every fisherman will have the right to sell his catch to the highest bidder. It is expected that the competition will result in a higher price to the fisherman and also in an increased catch.

Salmon for Bait from the Canneries.

Another important concession was the regulation requiring canneries to supply Canadian halibut vessels with salmon for bait at the price such salmon would be worth for canning. The uncertainty of the bait supply here has been one of the greatest obstacles to halibut fishing in the past. One of the Orders in Council of the Dominion Government provided that all fish caught by American vessels with bait obtained in British Columbia should be landed at a mainland port of British Columbia. No particular objection to this requirement was raised so long as bait was available; but for the past three or four months no bait has been obtainable in Prince Rupert, where practically all halibut cargoes are landed. This condition is said to have been due to the failure of herring to "run" in Chatham Sound and contributing inlets along the coast of the mainland, particularly Prince Rupert Harbor. The inland waters of lower Alaska have never yet lacked for herring, so the only thing for American halibut vessels to do was to go to Ketchikan for bait. Halibut caught with bait obtained at Ketchikan may be landed anywhere, and it was considered advisable to provide various depots for bait in British Columbia

waters. By requiring the canneries to furnish salmon bait to Canadian vessels, the supply of herring bait will be conserved for American vessels. The new order provides that canneries having salmon on hand must supply the needs of Canadian halibut fishing vessels with bait at actual value. Salmon bait is acceptable if herring is not available.

Wider Field of Motor-Boat Fishing.



ANOTHER change abolishes the regulations prohibiting the use of motor boats in salmon fishing. This means a wider field for motor-boat fishing and increased equipment for supplying fish to canneries. The principal advantage is that the owner of a motor boat of small size need not go to the deep seas for halibut in bad weather, nor need he wait for good weather. He can fish for salmon in the protected waters of the inlets and rivers.

The changes in the regulations go into effect after the present season. The advisory board also decided to grant one new license for a salmon cannery each year in district No. 2 until all the applications are disposed of; to add a new member to the board, to be appointed from Prince Rupert; to establish permanent headquarters for the inspector of fisheries for district No. 2, at Prince Rupert; and to fix the annual fee for miscellaneous fishing licenses at \$1.

Jurisdiction of Dominion Government.

The final matter submitted for consideration was a resolution in relation to the right of the Dominion Government to exercise exclusive authority over all the fisheries, whether in the deep seas or in the provincial waters of British Columbia. The Province has not been willing to concede exclusive rights to the Dominion, so far as so-called inland fisheries are concerned. The language of the resolution is as follows:

That the Dominion Government be requested to ask for a ruling from the Privy Council of Great Britain as to the rights of the Provincial Government of British Columbia to refuse to issue a provincial license to any applicant or applicants who have been granted a Dominion cannery license previously.

If this resolution receives favorable consideration, and the matter is carried to the Privy Council, it is felt that a decision will be arrived at in which the rights of each party in interest will be clearly defined.—H. S. Consul George M. Hanson, at Prince Rupert, B. C., in Commerce Reports.

SMART NOVA SCOTIAN FISHING SKIPPER.

The Yarmouth Times says: The schooner Morning Star, Capt. Harry Ross, arrived in Boston recently, with another excellent fare of fresh fish, stocking \$4,036 and the crew sharing \$111 per man. This was the second trip landed in sixteen days, stocking in that time upwards of \$7,000. That Captain Ross is a hustler and a fish killer of repute is evidenced by the fact that his vessel is now high line in the double dory haddock fleet and in four months and three days has stocked \$25,475. Owing to the fishermen's strike now on in Boston the Star, with many other vessels, has been tied up and is being cleaned, painted and generally overhauled. Capt. Ross is a Digby County man and was formerly skipper of the Digby schooner Dorothy M. Smart. The Editor of the Canadian Fisherman was acquainted with Capt. Ross on the "Smart" and "Effie Morrissey" and can testify to the ability and energy of this young fish killer—both trips being "highliners."

Sea Fisheries of the Empire

State Development and Control.

The British Fish Trade Gazette says:



MR. ARTHUR BIGLAND, M.P., a member of the Imperial Resources Development Committee, lectured on Tuesday at a meeting of the Colonial Section of the Royal Society of Arts on "The Empire's Assets and How to Use them." He said that although tremendous quantities of fish are already landed and consumed in the United Kingdom, amounting to about 600,000 tons in 1913, these quantities might be greatly increased by extension of supplies and improved methods of distribution and storage. In his opinion there almost certainly would be a continuance of the high price of meat, and as a remedy he suggested the substitution of a larger proportion of fish than at present in the dietary of our peoples. The seas around our Empire teemed with splendid fish. As a Canadian Bluebook well put it: "To say that Canada possesses the most extensive fisheries in the world is no exaggeration; moreover, it is safe to add that the waters in and around Canada contain the principal commercial food fishes in greater abundance than the waters of any other part of the world." Yet, in 1915, according to the same publication, there were only forty-eight steam fishing vessels, 1,236 sailing and gasoline vessels, 25,105 sail and row boats, and 431 carrying-smacks engaged in the Canadian fisheries. These did not include the figures for Newfoundland, in whose cod fisheries 2,000 schooners and 25,000 boats were engaged. Not the least important aspect of the fisheries question was the large consumption in other countries of cod, herrings, and other fish, pickled and otherwise. For instance, apart from Germany and North European countries, large amounts were taken by Greece, Italy, Spain, Portugal, and Brazil. Under State auspices, and with a comprehensive system of supply and distribution, a huge world-trade could be built up, and care would, of course, be taken to ensure that our Allies received the greatest possible advantage resulting from the increased supplies.

The Fisheries Should be Nationalised.

In the course of discussion Mr. Moreton Frewen said he was perfectly convinced that the fisheries of the Empire should and would be nationalised. There was more in the question of the nationalisation of fisheries than met the eye. In these they had one of those immense Empire assets which, in connection with such a huge scheme of State socialism as was now being projected, they should develop to the fullest extent. They had in the first place to bring before the Board which they hoped would be constituted the fact that this was an industry where the return on the capital expended was exceptionally large. In this country, for example, there was ten millions sterling invested in connection with the fisheries, and upon this the gross annual return was more than ten millions, or 100 per cent. on the capital invested. Official returns showed that in Canada the capital invested was five millions sterling, and the gross yield on that was seven millions sterling a year. He found that it was the same in the United States. He asked them to compare this enormous return with the average yield on capital invested in other undertakings. Capital invested in the British

Isles amounted to £114,000,000,000, and the gross national income from this was reckoned at £2,500,000,000, but if they eliminated certain items such as duty and purchase of raw material, they would find that the true income was at the utmost £1,500,000,000, or 9 per cent.

100 Per Cent Return on Capital Invested.

The return on the capital invested in fisheries, he repeated, was in all cases 100 per cent., and in the United States and Canada considerably more. The State must take the development of the sea resources in hand, for the nation was confronted with one of two alternatives: The people must eat more fish and less meat. The world was confronted to-day by a tremendous shortage of meat. And yet, out of our daily ration of 40 ounces, our consumption of fish was little over a single ounce. He maintained that if this country could get cold storage on thoroughly nationalised lines, and properly take advantage of the mighty harvest of the ocean, we could store, during the months of abundance against the period of gales and winter, such enormous quantities of fish as would keep the consumers of the country plentifully supplied. They could thereby yield the State a profit on the sale of fish—he might fairly put it at a penny a pound—and at the same time bring the consumption up to six or seven ounces per head.

Mr. J. Short, Norwich, said there was a huge harvest in the sea that was never touched, and within a few miles inland from his own city the people had no opportunity of getting fish which were so plentiful. What was wanted was proper refrigerators which would keep the harvest of the sea fresh and cheap.

The Hon. F. W. Young, Agent-General of South Australia, remarked that they should have as little as possible to do with State management of our resources, and the State should have still less to do with the profits arising from it, leaving management to individuals under the guidance of the central body that was instituted to develop the resources referred to.

LEONARD FISHERIES, LIMITED.

The Leonard Fisheries, Limited, has been incorporated, and is now owning and operating the old established fish firms of Leonard Bros., Montreal, St. John, N.B., and Grand River, Que.; Matthews & Scott, Queensport, Canso, and Cheticamp, N.S., and Messrs. A. Wilson & Sons, Halifax, Canso, Ingonish, Petit de Grat N.S.

The Company has purchased the Cold Storage plant at Port Hawkesbury, N.S., formerly belonging to the North Atlantic Fisheries, Limited, and also a number of fishing vessels. The new Company ranks as one of the largest fishing concerns on the continent.

Mr. S. Y. Wilson, Halifax, N.S. President of the Canadian Fisheries Association was in Montreal during the week of April 9th.

The Digby fishing schooners "Dorothy G. Snow" and "Albert J. Lutz" have been sold to British Columbia parties to engage in the halibut fishery. The price paid for these craft was around \$12,000 each. Their purchase means a loss of two of the half dozen Bank schooners fresh fishing out of Atlantic Canadian ports. They will leave for the Pacific via the Panama Canal shortly.

The Lobster and Salmon Embargo

Correspondence from the Minister of Fisheries.
London, March 2, 1917.

The Secretary of the Board of Trade;
Halifax, N.S.

Dear Sir:—

I duly received your cable with regard to the proposed embargo of the British Government upon Lobsters in connection with the general plan for the conservation of tonnage which in the opinion of the Government has been rendered necessary in consequence of the necessity of Great Britain supplying tonnage to other Allied nations and the submarine menace and the necessity of allowing the boats to bring into the United Kingdom so far as possible only the articles that are absolutely necessary for the support of the people at the present time.

On receipt of your cable I at once saw the Prime Minister who furnished me with a copy of the cable which he had received representing that the exporters and packers were alarmed at the proposed prohibition of Lobsters to Britain and pointing out that the embargo would prove disastrous to 15,000 maritime fishermen's families, also suggesting that distress would be relieved if importation was also placing maximum and even if necessary restricting quantities.

Having discussed the matter with Sir Robert, who also by communication and personal interview with members of the Government made your representations known to the Colonial offices. I took the matter up for discussion personally with the Rt. Hon. Walter Long, Colonial Secretary, and the Hon. Sir Albert Stanley, President of the Board of Trade. I urged upon them as strongly as I could the desirability of doing nothing to interfere with the importation of lobsters into Great Britain and pointed out how important an industry it was, what food value lobsters possessed, and that the amount of tonnage required for the annual shipments was not large as stated in your cable that the whole value remained within the Empire.

While admitting that the space occupied by the entire lobster shipment was not very large, the members of the Government to whom I have referred pointed out that this was also true of other commodities the importation of which from other countries had been prohibited but that taken altogether such commodities occupied a very large space which could be better used under existing circumstances for other goods that were more necessary to the well being of the people of the British Isles at the present time.

However, after fully discussing the question on several occasions, the members of the British Government to whom I before referred agreed to recommend that the imports of canned lobsters should be reduced to fifty percent of the imports for 1916, supplies being permitted from Canada and the United States in proportion to the pre-war imports from each of these countries: I have looked up the trade returns and find that the imports of canned lobsters from Canada and the United States are as follows:

	Canada	United States.
1911	37,121 cwts.	5,306 cwts.
1912	28,764 cwts.	5,630 cwts.
1913	33,139 cwts.	2,091 cwts.
1914	32,919 cwts.	1,641 cwts.
1915	38,610 cwts.	4,847 cwts.

1916 50,109 cwts. 2,025 cwts.
so that the imports from the United States have been practically a negligible quantity. Therefore on the basis of the export of 1916 the Government will receive from Canada about 25,000 cwts.

The view was further expressed that there might be a possibility of getting further amounts imported under the arrangement for using empty space in vessels, but at the present time it could not be told how much arrangements worked out and they did not care to say anything definite on this point. I believe, however, it can be worked out in such a way as to provide further space for Canadian Lobsters without interfering with the importation of other articles that are considered necessary here at present. I trust therefore that the result of the restrictions will not prove as great an injury as you evidently feared it would be to the Lobster industry in the Maritime Provinces.

Yours very truly,
J. D. HAZEN.

COPY.

Downing Street,
March, 1917.

Dear Mr. Hazen:—

With reference to our conversation this morning, the present position as regards the importation of canned salmon is as I explained really more favourable to Canada than to the United States. It is intended to license half the amount imported in 1916 and to distribute this between Canada and the United States on the basis of pre-war imports. The imports into the United Kingdom in cwts. were as follows:—

	Canada.	United States.
1911	169,070	226,789
1912	211,616	125,206
1913	275,362	265,817
1914	352,177	510,330
1915	387,171	555,524
1916	479,634	850,745

As the amount to be allowed in during 1917 from Canada and the United States will be 665,380 cwts. and this will be divided between Canada and the United States in proportion to their pre-war importations. Canada will be allowed rather more than half, say roughly 335,000 cwts. The figures would have been much less favourable to Canada if the amount had been distributed on the basis of the 1916 division instead of the pre-war division. I do not think the Foreign Office would have agreed to stop American imports but if there is differentiation I think you will agree that it is not against Canada.

I am moreover suggesting to the Government that an additional quantity might be bought for the troops in order to bring the imports from Canada up to the 1916 figures.

In the case of canned lobsters, imports have been as follows, in cwts.:

	From Canada.	Total
1911	37,121	42,427
1912	28,764	34,394
1913	33,139	35,230
1914	32,919	34,660
1915	38,610	43,457
1916	50,109	52,134

You will see that imports from the United States have been negligible and that Canada will be able to

send us 25,000 cwt. this year as compared with 29,000 cwt. in 1912 and 33,000 in 1913.

There might also be a possibility of getting further amounts imported under the arrangement for utilizing empty space in vessels, but, as we do not know exactly how these arrangements will work out, I am afraid that I cannot say anything definite as to this point.

Sincerely yours,
(Sgd.) WALTER H. LONG.

FIVE FISHERMAN DROWN—LOST LIVES IN GALE WHICH SWEEP NOVA SCOTIA.

HALIFAX, N.S.—Five fishermen lost their lives in a terrific southeast gale which swept Nova Scotia April 9th.

The dead are: Charles Conrod, 39; Duncan Conrod, 20; Frederick Duncan, 28, all of Liverpool, N.S.; Thomas Musey, Yarmouth, N.S.; and George Therian, Digby, N.S. A sloop containing the first three named foundered. The powerful gasoline boat of Musey and Therian came ashore with oars and trawls in position and it was thought at the time the men had been picked up by a passing schooner, but the washing ashore of one of the bodies has shattered this hope.

NEW LIFE FOR B.C. FISHERIES COMPANY.

D. T. Sandison, a long-headed Scotchman who has been in the deep-sea fishing business for twenty years, is in Vancouver, B.C., representing a syndicate of London capitalists who have bought assets of the B.C. Fisheries Company, at Skidegate, Queen Charlotte Island. Among the members of the syndicate are Sir Thomas Lipton, the man who put T in tea; Andrew Weir, whose ships go to all part of the world, and C. Williamson Milne, Crown Court, Old Broad St., London, England, the well known financier. The price paid for the various plants of the Company was \$50,000, but before the money is paid over to the receivers, Scotchman Sandison wants to be sure that the assets are intact, hence he is going up north the first week in April to look things over and if all is in ship-shape, he will return in ten days time and complete the deal, which it is hoped in British Columbia will give new life to the north country and make every one forget the hurrah days of Sir George Doughty in the light of more cautious development of the fisheries. Mr. Sandison is not unknown to the fishermen of B. C. for he has had dealing with them in the past. His people have been in the fish trade in Scotland for generations and he is hard-headed.

GERMANY'S PLAN TO HIDE U-BOAT LOSSES.

The German Admiralty are deeply concerned with the effect that their recent heavy losses in submarines, if known, could not fail to produce upon their U-boat crews, who are no longer dauntless volunteers of the earlier type. No precautions, therefore, are spared in order to prevent these lukewarm pirates from learning the truth about those who have "gone before." That is why under a recent order no U-boat employed on blockading duties, if and when it returns, is allowed to return to its port of departure, but proceeds to another base. In this way the U-boat crews in training or at rest cannot ascertain whether their comrades have come home safely or have met with due retribution.

SHAD, cwts.	5	10	.....	.....	.....	.....
Shad, used fresh, cwts. . . . .	.....	.....	.....	5	.....	.....
SARDINES, brls.	300	540	.....	.....	.....	.....
Sardines, sold fresh and salted, brls. . . . .	.....	.....	.....	300	.....	.....
HALIBUT, cwts.	7,603	46,879	.....	18,505	96,724	.....
Halibut, used fresh, cwts. . . . .	.....	.....	.....	7,603	.....	18,505
SOLES, cwts.	1,242	6,166	1,242	311	1,525	311
FLOUNDERS, cwts.	723	1,021	723	1,672	1,357	1,672
SKATE, cwts.	215	236	215	225	186	225
SMELTS, cwts.	22,224	205,190	22,224	21,393	115,994	21,393
OULACHONS, cwts.	16	96	16	.....	.....	.....
WHITING, cwts.	6	24	6	18	54	18
TOM COD, cwts.	4,019	6,272	4,019	4,918	2,579	4,918
OCTOPUS, cwts.	23	184	23	26	221	26
Grayfish, cwts.	900	315	900	.....	.....	.....
OYSTERS, brls.	42	294	42	335	1,340	335
CLAMS, brls.	2,532	3,110	.....	6,846	13,147	.....
Clams, used fresh, brls. . . . .	.....	.....	.....	2,132	.....	6,531
Clams, canned, cases . . . . .	.....	.....	.....	400	.....	315
SCALLOPS, brls.	200	500	.....	670	1,390	.....
Scallops, shelled, gals. . . . .	.....	.....	.....	400	.....	1,340
CRABS, COCKLES, etc., cwts.	174	1,059	174	263	1,737	268
TOTAL VALUE		580,864			500,759	

THE FISHERIES IN PRINCE EDWARD ISLAND.

At the annual meeting recently of the Prince Edward Island Development Commission an organization instituted in March 1916 for the purpose of devising plans for the development of our natural resources, a valuable report on our Fisheries was submitted by W. F. Tidmarsh, Chairman of a Sub-Committee composed of the largest fishing concerns in the province.

They reported that our fisheries so far as they are developed are in a healthy condition.

The lobster fishery the only branch of the industry fully developed, showed a notable increase in 1916 over 1915. Cannermen and exporters are urged to assist the Federal Government in enforcing the close season. There were too many violations of the law last year.

The Committee asked the lobster fishermen to direct their energies to a greater extent in the future to the catching of cod and other ground fish after the close of the lobster season.

Last year there was a substantial increase in the output of cod, hake and other ground fish.

One of the great needs of our cod fishery is a continuous supply of fresh bait. This can best be done by providing cold storage plants at different centres, for the handling of herring, in the early spring, when they are most plentiful. Some years ago the Federal Government assisted companies composed chiefly of fishermen to build and operate such plants. This move, was not very successful. Plants were abandoned, or devoted to other uses, because the scheme was in advance of the necessities and because of inexperience or disagreement among the owners.

The frozen smelt industry is a very important one on the Island, the exports last year amounting to 5,077 tons.

The Committee advocated the enlargement of the present boat harbours which were constructed by the Federal Government some years ago, and also the establishment of additional harbours of this kind.

The Committee strongly emphasized the need of more technical training for fishermen. The Federal Government, they point out appropriate large sums for

agricultural education. A similar educational effort applied to our fishermen would produce possibly, 100 fish at least, to every one that is produced today. Organized education in Canada is now being extended to nearly all our occupations. It is difficult to understand why the fishermen have been neglected.

The Committee outline what the British Isles, Norway, the Netherlands, Japan and other countries are doing in the time of instructing fishermen by schools, shot cruises, etc.

"Our plan," says the Committee, must be to train the more intelligent young fishermen as instructors and our methods must be of such a nature that the interests of these young fishermen shall be gained. When this is furnished, they will soon find means of adding to their equipment, whatever more is necessary."

The Committee further suggested that the Government circulate illustrated bulletins, provide demonstrations by means of travelling instructions at suitable centres, also short courses suitable for selected leaders from all fishing localities.

Short courses in Nature study, having to do with the fisheries should be taught in all public schools in fishing communities.

The oyster industry also received considerable attention from the Committee, and they recommended among other things that there should be an amendment of the plan under which oyster areas are granted for artificial cultivation, also the retention and utilization of oyster areas planted by the Government for educational purposes.

The utilization of the Fishery Protection Service for obtaining data concerning all edible fish, including a number of kinds that are practically unused at present and concerning the best methods of dealing with the by-products of fish now universally wasted, was also advocated in the meeting.

[P.S.—It is interesting to note that the reforms urged are identical with those proposed by the Canadian Fisheries Association and this magazine. There is an undoubted awakening in our fisheries all over the country.—Editor.]

BOOMING SABLEFISH, ALIAS BLACK COD.

Sablefish, more commonly known as black cod, was formally presented to the elite of available aquatic food supplies of the United States Bureau of Fisheries. Officials of the department, believing that the democracy of high prices has upset the old exclusiveness of the so-called "codfish aristocracy," established by the Pilgrim fathers, have inaugurated a campaign to demonstrate to the people who are protesting against the high cost of living that the sablefish are entitled to the same regard accorded the fish which have been accepted by the housewife for generations. They stand sponsor for the statement that the so-called black cod, free from bone, white in flesh, and requiring little time for cooking, is suitable for the humblest home because of its price and for the millionaire's table for its firmness of texture and delicious flavor.

Although the sablefish was discovered off the coast of Alaska in 1811, until now its excellence has been known to only a few persons. The department believes, however, that the time has come when because of its edible qualities and low price, it should be made known to all. It is found in the deep water off the Pacific coast from San Francisco to Alaska, and is particularly abundant from Oregon northward. It has been caught more or less freely by halibut fishermen for many years, but has been regarded as a nuisance rather than at its true worth, because, "with characteristic American heedlessness of the value of natural resources," it has been neglected by the consumer and there has been no market for it.

Millions of pounds have been returned to the sea annually, while the people who should have been using it have been clamoring for investigations into the reasons for the high cost of living. The sablefish as caught averages about fifteen pounds in weight, although it grows much larger. Because of its firm texture, it is transported easily, and, according to the department, is available for use as far east as New York and New England. The fish can be used in as many ways as can cod. Cod is dry-meated, but the department officials say that the sablefish is one of the richest and fattest of the American fishes.

Mr. Walter Lambert, naval architect of Montreal, and who has been devoting a great deal of attention to the designing of trawlers and auxiliary sailing fishing craft, has severed his connection with Messrs. John Reid and Company, Ltd., and will open an office for himself. Mr. Lambert is a member of the Institute of Naval Architects, the Canadian Fisheries' Association, and is already known to our readers by the designs published in the Canadian Fisherman.

BIGGEST KELP BARGE.

Built at a cost of over \$2,000, probably the largest kelp barge on the Pacific Coast was launched recently from the private ways of the Pacific Products Company, Los Angeles, Cal. The big scow is equipped for coastwise commerce, and has a capacity of 325 tons. The dimensions of the boat is 30 by 80 feet and 8 feet deep.

CANADIAN OWNED?

The Canadian-owned iron screw trawler *Crocus*, 113 tons gross and 62 tons net register, has been sold for about £2,100. She was built at Middlesborough, in 1899, and has compound engines 35 h.p.n.; cylinders

15½ inch and 29 inch by 21 inch stroke; speed 9½ knots. Her dimensions are: Length, 95 feet; breadth, 20.7 feet; depth, 10.7 feet.—British Fishing News.

(There is no steam trawler named *Crocus* mentioned in either Lloyd's Register or the Canadian Shipping List.—Ed. C. F.)

BRINE FOR SHUCKING SCALLOPS.

The custom of soaking scallops in fresh water, which has been practiced for a number of years in certain localities, is regarded by the United States Department of Agriculture as likely to result in a violation of the Federal Food and Drugs Act, and, with the opening of the scallop season, shippers are being warned that in the opinion of the department it is unlawful to sell in interstate commerce, scallops that have been treated in this way. The effect of soaking scallops in fresh water to increase their volume, even when the intention is only to wash the shellfish, and such an increase is held to be adulteration within the meaning of the food and drugs act.

To those shippers who find it is difficult to keep clean scallops that are shucked in a dry basket, the department recommends the use of fresh brine containing 2½ per cent of salt. Two pounds of salt to ten gallons of water will give approximately the proper strength, and small amounts of this liquid can be used in the shucking basket without much danger of soaking the scallops. Brine of a similar strength may also be used to wash the shucked scallops, but the liquid should be changed frequently and should not be used when dirty.

Clean salt water from the ocean may be used instead of the brine if it is possible to obtain water from sources which are free from all risk of contamination by sewerage.

It is also recommended that the scallops, whenever possible, should be washed in clean salt water before they are brought ashore. This will get rid of a great deal of mud. If clean tables and receptacles and a clean, dry place for storing the molluscs in the shell are provided, there will be less difficulty in keeping the scallops clean without the use of water.

If fresh water is used for washing purposes, the scallops must not remain in contact with it for more than two or three minutes. If they are left in the water any longer there is danger of "soaking," that is to say, they will absorb the water and increase in size. This, it is held, affects the quality or strength of the substance in a manner prohibited by the food and drugs act.

In its investigation into the conditions in scallop shucking establishments the department has found that it takes from 30 to 45 minutes for the average shucker to fill a pail. If therefore, the scallops are shucked into pails of fresh water, they almost certainly will remain there sufficiently long for soaking to take place. Even when smaller receptacles are used, if water be present, soaking will probably occur. The effect of this process is heightened when they are washed subsequently in tubs of fresh water. The use of brine as described above is, therefore, recommended as a means of securing cleanliness and attractiveness for the shucked scallops, without violating the provisions of the Federal food and drugs act.

The washed scallops should be carefully and completely drained before shipment, as the presence of free liquid would be regarded as an adulteration.—Eastport Sentinel.



PACIFIC NOTES.

The first of the herring struck in at Port Simpson on March 7, and three seining crews which were operating there secured fair catches. As the run increased, more boats were put into operation, and as much as fifty tons per day were caught and taken to Prince Rupert for freezing. The run has continued through the month of March, and is not yet over.

Mr. W. E. Anderson, of the Quathiaski Canning Co., Limited, Quathiaski Cove, B.C., returned to Vancouver on March 7th after visiting Ottawa, Toronto, Montreal, and various Eastern United States points.

The trawling operations of the S.S. "James Carruthers" out of Prince Rupert are continuing, although it is as yet impossible to say whether or not these operations are a financial success. On March 8th the "Carruthers" brought in 43,000 lbs. of fish, of which only 600 lbs. was halibut, 10,000 lbs. cod, and the balance flat fish of various kinds. This experiment is being watched with great interest by the fishing industry, and if successful there is no doubt that many other boats will be fitted up to operate as steam trawlers.

The Gosse-Millerd Packing Company, which has hitherto been known only in the salmon canning business, has recently erected a small cold storage plant and fish freezing plant at Bella Bella, B.C. This plant is now making ice, and for about a month past has been freezing a quantity of bait. They expect to do quite a business with halibut schooners in bait during the Summer, and they also expect to purchase halibut caught by Indians and local fishermen and freeze the same for the Eastern markets.

During the early part of March the usual shortage of refrigerator cars which exists at Prince Rupert became accentuated, and for practically one week no refrigerator cars were available at all at that port. As a result, a number of schooners which put in to Rupert with trips of halibut, were obliged to go to Seattle in order to dispose of their fish. The Canadian Express Company, which operates over the Grand Trunk Pacific Line, were unable to supply the refrigerator equipment, and were obliged to call on the Great Northern Express Company, who supplied refrigerator cars via Winnipeg, and relieved the shortage, on March 12th.

Mr. F. E. Payson, Manager of the Goletas Fish Company of Vancouver, B.C., has left for Boston and other Eastern Cities.

The Goletas Fish Company, Limited, of Vancouver, B.C., and Shushartie Bay, has changed the name to Western Packers Limited. The new Company will operate under the same management as the former

Goletas Fish Company, and will in addition operate the Butedale Cannery, and cold storage plant, at Butedale, B.C.

The schooner "Knickerbocker", while proceeding South from the Yakutat fishing banks, with a cargo of fish, broke her starboard tail shaft and lost her propeller. The vessel put into Seward, Alaska, and discharged her cargo. A new tail shaft propeller was shipped to Seward and repairs effected at that port.

Capt. W. H. Gillen, formerly of the Schooner "Jessie" will fish this Summer out of Prince Rupert on the Schooner "Sealight".

Capt. Jacob Hansen, late of the Steamer "New England", has taken command of the Steamer "Chicago."

A new company has been formed to operate out of Prince Rupert, to be known as the Deep Sea Fishing Company, the shareholders including Messrs. George Selig, William Selig, Bainter and McNulty. They have acquired the "Haysport No. 1" and the "Haysport No. 2" from the Skeena River Fisheries Limited, and have also built the launch "Kitwinmar". The latter vessel will be operated in the Herring business.

HALIBUT ARRIVALS AT PACIFIC COAST PORTS DURING THE MONTH OF FEBRUARY 1917.

Feb. 2.	Chief Skugaid, 4,000,	The C. F. & C. S. Co., Ltd.
Feb. 3.	Tom & Al, U.S., 23,000,	The C. F. & C. S. Co., Ltd.
Feb. 3.	Washington, U.S., 17,000,	The C. F. & C. S. Co., Ltd.
Feb. 6.	Pacific, U.S., 15,000,	Pacific Fisheries Company.
Feb. 7.	America, U.S., 20,000,	The C. F. & C. S. Co., Ltd.
Feb. 7.	Gilford, 6,000,	The C. F. & C. S. Co., Ltd.
Feb. 9.	Geo. E. Foster, 7,000,	The C. F. & C. S. Co., Ltd.
Feb. 9.	Grier Starrett, 13,000,	The C. F. & C. S. Co., Ltd.
Feb. 10.	Carruthers, Jas., 5,000,	The C. F. & C. S. Co., Ltd.
Feb. 13.	Malola, U.S., 16,000,	The C. F. & C. S. Co., Ltd.
Feb. 15.	Sumner, U.S., 16,000,	Atlin Fisheries Ltd.
Feb. 15.	Agnes B., 10,000,	Atlin Fisheries Ltd.
Feb. 15.	Trio, U.S., 12,000,	Royal Fish Company.
Feb. 16.	Director, U.S., 7,000,	Atlin Fisheries Limited.
Feb. 18.	Republic, U.S., 30,000,	The C. F. & C. S. Co., Ltd.

- Feb. 18. Rolfe, U.S., 11,000, The C. F. & C. S. Co., Ltd.
 Feb. 18. W. R. Lord, 15,000, The C. F. & C. S. Co., Ltd.
 Feb. 18. Chief Skugaid, 20,000, The C. F. & C. S. Co., Ltd.
 Feb. 19. Carruthers, Jas., 10,000, The C. F. & C. S. Co., Ltd.
 Feb. 20. Puritan, U.S., 20,000, Booth Fisheries Company.
 Feb. 20. Olympic, U.S., 15,000, Pacific Fisheries Co.
 Feb. 20. Panama, U.S., 30,000, Atlin Fisheries Ltd.
 Feb. 21. Kodiak, U.S., 30,000, The C. F. & C. S. Co., Ltd.
 Feb. 21. Constance, U.S., 26,000, The C. F. & C. S. Co., Ltd.
 Feb. 23. Commonwealth, U.S., 13,000, Booth Fisheries Company.
 Feb. 23. Nellie, U.S., 8,000, Booth Fisheries Company.
 Feb. 23. Tuladi, 5,000, The C. F. & C. S. Co., Ltd.
 Feb. 23. P. Doreen, 10,000, The C. F. & C. S. Co., Ltd.
 Feb. 23. Margalice, 5,000, Royal Fish Company.
 Feb. 23. Lillian M., 5,000, Atlin Fisheries Limited.
 Feb. 24. Arctic, U.S., 15,000, The C. F. & C. S. Co., Ltd.
 Feb. 24. Atlantic, U.S., 15,000, The C. F. & C. S. Co., Ltd.
 Feb. 24. Wireless, U.S., 5,000, Royal Fish Company.
 Feb. 26. E. Nielson, U.S., 10,000, The C. F. & C. S. Co., Ltd.
 Feb. 26. Alvilda, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Feb. 26. America, U.S., 20,000, The C. F. & C. S. Co., Ltd.
 Feb. 26. Eagle, U.S., 26,000, The C. F. & C. S. Co., Ltd.
 Feb. 27. Tom & Al, U.S., 45,000, The C. F. & C. S. Co., Ltd.
 Feb. 27. M. T. 3, 8,000, Royal Fish Co.
 Feb. 28. Nornen, 5,000, Atlin Fisheries Limited.
 Feb. 28. Loyal, U.S., 14,000, The C. F. & C. S. Co., Ltd.

Vessels not specified 'U.S.' are of Canadian Register.

AT VANCOUVER, B.C.:

- Feb. 3. Celestial Empire, 60,000, The Canadian Fishing Co., Ltd.
 Feb. 5. Borealis, 40,000, The Canadian Fishing Co., Ltd.
 Feb. 5. Kingsway, 35,000, The Canadian Fishing Co., Ltd.
 Feb. 10. Pescawha, 25,000, The Canadian Fishing Co., Ltd.
 Feb. 24. Carlotta G. Cox, 50,000, The Canadian Fishing Co., Ltd.
 Feb. 27. Celestial Empire, 100,000, The Canadian Fishing Co., Ltd.
 Feb. 28. Flamingo, 60,000, The Canadian Fishing Co., Ltd.

AT KETCHIKAN, ALASKA:

- Feb. 1. Prospector, 10,000, New England Fish Company.

- Feb. 1. Knickerbocker, 35,000, New England Fish Company.
 Feb. 10. Tordenskjold, 13,000, Ripley Fish Company.
 Feb. 10. Seattle, 11,000, Riley Fish Company.
 Feb. 12. Omaney, 11,000, San Juan Fishing & Pkg. Co.,
 Feb. 14. Liberty, 30,000, San Juan Fishing & Pkg. Co.
 Feb. 14. Senator, 7,000, San Juan Fishing & Pkg. Co.
 Feb. 14. Active, 6,000, Ripley Fish Company.
 Feb. 15. J. P. Todd, 11,000, Washington Fish & O. Co.
 Feb. 20. Yakutat, 20,000, San Juan Fishing & Pkg. Co.
 Feb. 22. Tyee, 25,000, New England Fish Company.
 Feb. 23. Prospector, 25,000, New England Fish Company.
 Feb. 23. Knickerbocker, 25,000, New England Fish Company.

HALIBUT ARRIVALS AT PACIFIC COAST PORTS MARCH 1ST TO MARCH 31ST INCLUSIVE.

At Prince Rupert, B.C.:

- Mar. 1.—Loyal, U.S., 14,000, The C. F. & C. S. Co., Limited.
 Mar. 1.—Grier Starrett, 8,000, The C. F. & C. S. Co., Limited.
 Mar. 1.—Jennie, U.S., 9,000, The C. F. & C. S. Co., Limited.
 Mar. 1.—Pauline, U.S., 14,000, The C. F. & C. S. Co., Limited.
 Mar. 1.—Omaney, U.S., 55,000, The C. F. & C. S. Co., Limited.
 Mar. 1.—Carruthers, Jas., 20,000, The C. F. & C. S. Co., Limited.
 Mar. 1.—Chief Zibassa, 17,000, The C. F. & C. S. Co., Limited.
 Mar. 1.—Orient, U.S., 15,000, Atlin Fisheries Limited.
 Mar. 1.—Tordenskjold, U.S., 25,000, Atlin Fisheries Limited.
 Mar. 1.—Eidsvold, U.S., 16,000, Atlin Fisheries Ltd.
 Mar. 1.—Nautilus, U.S., 7,000, Atlin Fisheries Ltd.
 Mar. 1.—Seattle, U.S., 45,000, Booth Fisheries Co.
 Mar. 1.—Washington, U.S., 25,000, Pacific Fisheries Company.
 Mar. 1.—Pacific, U.S., 28,000, Pacific Fisheries Co.
 Mar. 1.—Ed. Rodel, 5,000, Royal Fish Co.
 Mar. 3.—Liberty, U.S., 35,000, The C. F. & C. S. Co., Limited.
 Mar. 3.—Panama, U.S., 17,000, The C. F. & C. S. Co., Limited.
 Mar. 4.—Bryan, U.S., 10,000, Booth Fisheries Co.
 Mar. 4.—Andrew Kelly, 40,000, The C. F. & C. S. Co., Limited.
 Mar. 4.—Agnes, B., 8,000, The C. F. & C. S. Co., Ltd.
 Mar. 4.—Glacier, U.S., 13,000, The C. F. & C. S. Co., Limited.
 Mar. 4.—Mars, U.S., 10,000, The C. F. & C. S. Co., Limited.
 Mar. 4.—Senator, U.S., 20,000, Booth Fisheries Co.
 Mar. 4.—Thelma, U.S., 14,000, Atlin Fisheries Ltd.
 Mar. 4.—Viking, U.S., 10,000, Atlin Fisheries, Ltd.
 Mar. 6.—Sitka, U.S., 36,000, Pacific Fisheries Co.

Mar. 6 Magnolia U.S., 8,000, The C. F. & C. S. Co., Limited.
 Mar. 6 Teddy, J., U.S., 15,000, The C. F. & C. S. Co., Limited.
 Mar. 6 Shamrock, U.S., 20,000, Atlin Fisheries Ltd.
 Mar. 6 Kennebec, U.S., 7,000, Atlin Fisheries Ltd.
 Mar. 7 Roffe, U.S., 10,000, The C. F. & C. S. Co., Limited.
 Mar. 9 Director, U.S., 16,000 Pacific Fisheries Co.
 Mar. 9 Volanteer, U.S., 17,000, The C. F. & C. S. Co., Limited.
 Mar. 9 Manhattan, U.S., 100,000, Atlin Fisheries, Limited.
 Mar. 12 Amunsden, U.S., 15,000, The C. F. & C. S. Co., Limited.
 Mar. 12 Pioneer, U.S., 20,000, The C. F. & C. S. Co., Limited.
 Mar. 12 Commonwealth, U.S., 30,000, Booth Fisheries Company.
 Mar. 12 Arctic, U.S., 15,000, Booth Fisheries Co.
 Mar. 12—Active, U.S., 6,000, Booth Fisheries Co.
 Mar. 12—Jas. Carruthers, 20,000, The C. F. & C. S. Co., Limited.
 Mar. 13—Kodiak, U.S., 20,000, The C. F. & C. S. Co., Limited.
 Mar. 13—Olympic, U.S., 20,000, Booth Fisheries Co.
 Mar. 13—Gjoa, U.S., 12,000, Booth Fisheries Co.
 Mar. 13—Corona, U.S., 10,000, Pacific Fisheries Co.
 Mar. 13—Borealist, 10,000, Atlin Fisheries Limited.
 Mar. 13—Nornen, 15,000, Atlin Fisheries Limited.
 Mar. 14 Fairbanks, U.S., 16,000, Booth Fisheries Company.
 Mar. 14—J. P. Todd, U.S., 9,000, Booth Fisheries Co.
 Mar. 14—Cora, U.S., 8,000, Pacific Fisheries Co.
 Mar. 14—E. Nielson, U.S., 6,000 Pacific Fisheries Co.
 Mar. 14—Onah, U.S., 10,000, The C. F. & C. S. Co., Limited.
 Mar. 14—Margalice, 8,000 The C. F. & C. S. Co., Ltd.
 Mar. 16—Alten, U.S., 55,000, The C. F. & C. S. Co., Limited.
 Mar. 16—Tordenskjold, U.S., 15,000, Pacific Fisheries Company.
 Mar. 16—Alvilda, U.S., 9,000, Pacific Fisheries Co.
 Mar. 16—D. C. F. 1, 6,000, The C. F. & C. S. Co., Ltd.
 Mar. 16—Nautilus, 6,000, The C. F. & C. S. Co., Ltd.
 Mar. 19—Atlantic, U.S., 20,000, Booth Fisheries Co.
 Mar. 19—Eidsvold, U.S., 7,000, Booth Fisheries Co.
 Mar. 19—Liberty, U.S., 55,000, Pacific Fisheries Co.
 Mar. 19—Tom & Al, U.S., 55,000, The C. F. & C. S. Co., Limited.
 Mar. 19—Panama, U.S., 40,000, Atlin Fisheries Limited.
 Mar. 19—Agnes B., 5,000 Atlin Fisheries Limited.
 Mar. 19—Rosespit, 15,000, Atlin Fisheries Limited.
 Mar. 19—Tuladi, 15,000, Atlin Fisheries Limited.
 Mar. 20—America, U.S., 10,000, The C. F. & C. S. Co., Limited.
 Mar. 21—Chief Skugaid, 20,000, The C. F. & C. S. Co., Limited.
 Mar. 21—Geo. E. Foster, 10,000, The C. F. & C. S. Co., Limited.
 Mar. 22—Grier Starrett, 6,000, The C. F. & C. S. Co., Limited.
 Mar. 22—Eagle, U.S., 24,000, Booth Fisheries Co.
 Mar. 23—Vesta, U.S., 20,000, The C. F. & C. S. Co., Limited.
 Mar. 24—Andrew Kelly, 40,000, The C. F. & C. S. Co., Limited.

Mar. 26—Flamingo, U.S., 8,000, The C. F. & C. S. Co., Limited.
 Mar. 27—Bryan, U.S., 5,000, The C. F. & C. S. Co., Limited.
 Mar. 27—Shamrock, U.S., 5,000, The C. F. & C. S. Co., Limited.
 Mar. 30—Joe Baker, 5,000, Royal Fish Company.
 Mar. 31—Nornen, 10,000, The C. F. & C. S. Co., Ltd. Vessels not specified "U.S." are of Canadian Registry.
At Vancouver, B.C.:
 Mar. 1.—Borealis, 50,000, The Canadian Fishing Co., Limited.
 Mar. 3.—Kingsway, 50,000, The Canadian Fishing Co., Limited.
 Mar. 20.—Celestial Empire, 50,000, The Canadian Fishing Co., Limited.
 Mar. 21.—Flamingo, 55,000, The Canadian Fishing Co., Limited.
 Mar. 24.—Iskum, 15,000, The Canadian Fishing Co., Limited.
 26.—Kingsway, 55,000, The Canadian Fishing Co., Limited.
 Mar. 30.—Carlotta G. Cox, 25,000, The Canadian Fishing Co., Limited.

At Ketchikan Alaska:

Mar. 12.—Dolphin, 12,000, New England Fish Co.
 Mar. 12.—Lister, 10,000, New England Fish Co.
 Mar. 12.—Hi Gill, 12,000, New England Fish Co.
 Mar. 12.—Daisy, 11,000, New England Fish Co.
 Mar. 12.—Rolfe, 14,000, New England Fish Co.
 Mar. 13.—H. & R., 6,000, New England Fish Co.
 Mar. 13.—Roald, 12,000, New England Fish Co.
 Mar. 13.—Venus, 25,000, New England Fish Co.
 Mar. 15.—Prospector, 15,000, New England Fish Co.
 Mar. 17.—E. Nilsen, 8,000, New England Fish Co.
 Mar. 17.—Kingfisher, 6,000, New England Fish Co.
 Mar. 20—Lincoln, 5,000, New England Fish Co.
 Mar. 20.—Pauline, 13,000, New England Fish Co.
 Mar. 20.—Tyee, 30,000, New England Fish Co.
 Mar. 20.—Loyal, 13,000, New England Fish Co.
 Mar. 20.—Hellenic, 12,000, New England Fish Co.
 Mar. 21—Orient, 32,000, New England Fish Co.
 Mar. 22.—J. P. Todd, 5,000, New England Fish Co.
 Mar. 22.—Star, 15,000, New England Fish Co.
 Mar. 22.—Senator, 17,000, New England Fish Co.
 Mar. 22.—Eureka, 5,000, New England Fish Co.
 Mar. 24.—Omaney, 50,000, New England Fish Co.
 Mar. 26.—Manhattan, 80,000, New England Fish Co.
 Mar. 27.—Aurora, 5,000, New England Fish Co.

BOOTH FISHERIES CO. BUYS BRITISH COLUMBIA CANNERY.

The Booth Fisheries company on March 12 took over the Scotch-Canadian cannery property at Steveston, B. C., and will direct the operation of the plant from Seattle. The property includes a large four-line sanitary cannery, with full equipment of American can company machinery, located at the mouth of the Fraser river, which has been a producer of some consequence in the past.

Operations will be conducted under the name of Booth Fisheries Company of Canada, Ltd., a Canadian subsidiary of the American corporation. Oscar Bergseth, formerly assistant purchasing agent of the Northwestern Fisheries Company at Seattle, has been appointed superintendent, and is now at the plant making preparations for the season's work. — Pacific

ESTABLISHED 1736

Gourock Ropework Export Co.

LIMITED (OF SCOTLAND)

MANUFACTURERS OF

The Celebrated "Gourock" Brand of Herring and Mackerel Nets

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CHATHAM - ONTARIO

We Manufacture Fish Boats; Gasoline Engines, two and four cycle, both Marine and Stationary; also Stake Drivers and Pullers; Ice Crushers, etc, for Fishermen.

Our Output is first class; made from the best material obtainable; put together by experienced mechanics; and sold at reasonable prices.

THE New Brunswick Cold Storage Co., Limited ST. JOHN, N.B., CANADA

750,000 CUBIC FEET.

STRICTLY PUBLIC WAREHOUSING. NO TRADING IN LINES HANDLED.

SWITCHING TO ALL RAILWAYS. THE ONLY COLD STORAGE WITH SIDINGS LOCATED AT A CANADIAN WINTER PORT.

BETTER FACILITIES FOR ACCUMULATING LOCAL GOODS FOR CARLOT WESTERN SHIPMENT OR WESTERN GOODS FOR EXPORT FURTHERANCE THAN ANY OTHER HOUSE.

WIRE US YOUR PROPOSITIONS. PLEASE. RATES ALWAYS AVAILABLE.



ONTARIO Department of Game and Fisheries

The attention of the fishermen is invited to the following provisions of the Dominion Special Fishery Regulations for the Province of Ontario and of the Ontario Game and Fisheries Act.

Fishing by means other than angling or trolling except under the authority of a lease, license or permit issued by this Department is prohibited.

Non-residents, that is persons domiciled in the Province for a period of less than six months, are not allowed to angle or troll without an angler's permit.

No one shall fish for or take large mouthed or small mouthed black bass, maskinonge, speckled trout, brown trout, rainbow or other Pacific trouts, otherwise than by angling.

No one shall fish for large mouthed or small mouthed black bass, maskinonge, salmon, speckled trout, brown trout, rainbow or other Pacific trouts through the ice.

The sale or export of small or large mouthed black bass, of maskinonge and of speckled trout, brown trout, rainbow or other Pacific trouts is prohibited.

The sale or export of pickerel (dore) less than fifteen inches in length, measuring from the point of the nose to the centre of the posterior margin of the tail, is prohibited.

The taking of whitefish or salmon trout less than two pounds in weight is prohibited.

The use of trap nets is prohibited.

Fishing with gill nets in Lake Erie, from December 15th to March 15th, both days inclusive, is prohibited.

No one shall set or place nets other than hoop nets, dip or roll nets, in any river or creek or within five hundred yards of the entrance thereto. This prohibition shall not apply to carp fishing.

CLOSE SEASONS (Commercial Fish.)

Pickerel.—In water other than the Great Lakes, Georgian Bay, North Channel and connecting waters—April 15th to June 15th.

Whitefish and Salmon Trout.—In waters where commercial fishing with gill nets is not permitted—October 5th to November 5th, both days inclusive.

In the Bay of Quinte—November 1st to November 30th, both days inclusive.

In waters other than the Bay of Quinte, Great Lakes, Georgian Bay, North Channel and connecting waters, where commercial fishing with gill nets is permitted—October 5th to November 30th, both days inclusive.

LIMIT OF CATCH (Commercial Fish.)

(By Angling or Trolling.)

Pickerel.—Twelve per day.

Salmon Trout.—Big and Little Rideau Lakes, three per day. Other waters except Great Lakes, Georgian Bay, North Channel and connecting waters, five per day.

A. SHERIFF,

Deputy Minister of Game and Fisheries.

Department of Game and Fisheries.

Toronto, Feb. 1st., 1916.

Exceptional Angling Opportunities

are offered by the Province of Quebec, which is the only one that leases exclusive hunting and fishing territories over large areas of forest, lakes and rivers, both to Clubs and private individuals, with the privilege of erecting camps thereon.

Membership may be obtained, if desired, in many existing clubs, with camp privileges already provided, and often with the right of erecting private summer homes on suitable sites on the club territory.

On all unleased Crown Lands and Waters, angling and hunting are absolutely free to residents of the Province, and the only charge to non-residents is the cost of the non-resident fishing or hunting license.

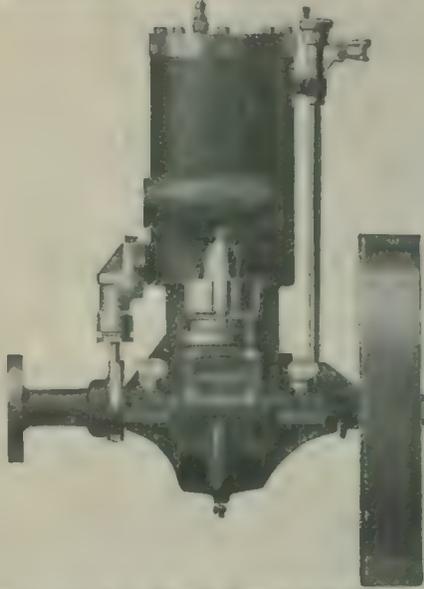
To the Wholesale Fish Trade

The attention of dealers who receive their fresh fish from Portland and other foreign sources is directed to the exceptional opportunities of obtaining their supply from the Baie des Chaleurs and the North Shore of the St. Lawrence, to their own advantage and that of their customers, and to the benefit of the fishermen of the Province of Quebec.

For all Information apply to—

The Minister
of Colonization, Mines and
Fisheries
Of the Province of Quebec

THE ROBERTS FISHERMAN \$150.00



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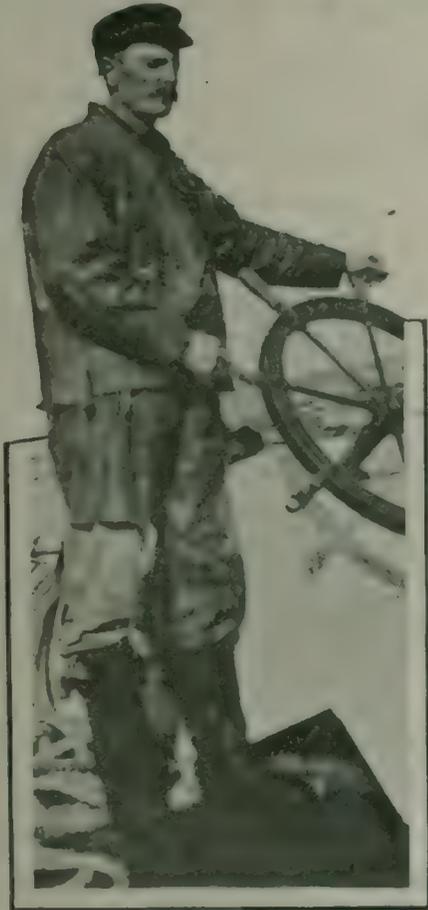
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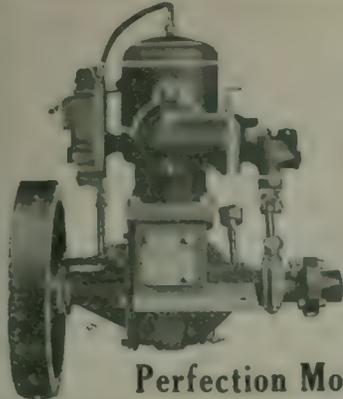
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SEATTLE SALMON CANNING TRADE.

SEATTLE, Wash, April 6.—The "Canning Trade" says: The war preparations have had an extremely stimulating influence on the local canned salmon situation. Brokers have had many inquiries as to what they are in a position to do in the way of supplying canned salmon as an army and navy ration. At present, of course, they cannot do anything worth mentioning. What little salmon is available would cut no figure in rationing the nation's fighting men. Nor is the salmon to be found anywhere in the United States, for the bulk of it has gone out of the country, mostly to England. In years past it has frequently happened that when packers were out of fish jobbers and distributors had large supplies. This is not the situation here today. There is no doubt but that prices all the way from ten to fifteen cents, possibly more, could be obtained for canned salmon for prompt delivery, were same available. Just like many other commodities, there is no market on canned salmon. Price is not the important thing. In fact, it cuts very little ice.

In the face of the present demand and the possibility that the United States Government will be in the market for canned salmon out of the new pack, canners and brokers generally are very bullish in their ideas and not inclined to close contracts, even on the basis of prevailing prices. In fact, the situation is very uncertain, but looks good to most packers or to anybody who has fish to sell or who expects to have a supply. As matters now stand, the sentiment of the trade here is that prices cannot be lower, and that a good stiff

demand from the Government will keep values right up at a good level throughout the year.

Gray Fish.—The ear situation is not improving at all, notwithstanding that railroad officials had stated that the situation would show improvement by this time.

Largely as an experiment, the Booth Fisheries Company is planning to pack gray fish at its Anacortes (Wash.) cannery. Should the experiment prove as successful as the officers of the company anticipate, it is announced that the company will put up a plant exclusively for the canning of this fish.

The packing of gray fish is something new in Puget Sound. The fish abounds in great quantities. Heretofore, however, packers have not considered the fish a commercial possibility. The United States Bureau of Fisheries, however, interested itself in this fish. A number of tests were made. Some of the fish were canned and carefully tested for food value, taste, texture, appearance, etc. The Government came out strong for this fish. A summary of its finding was published in the Seattle market report of The Canning Trade. Briefly, the Government found that the food value was very high as compared with other fish and that really the product was very delectable.

The first real attempt to can this fish in commercial quantities will be made by the Booth Fisheries Company, which is prepared to give the product a fair test under favorable conditions. The canning will be done in connection with the company's mild curing plant at Anacortes, which will be managed this year by William P. McCracken.

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THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV

MONTREAL, MAY, 1917

No. 5

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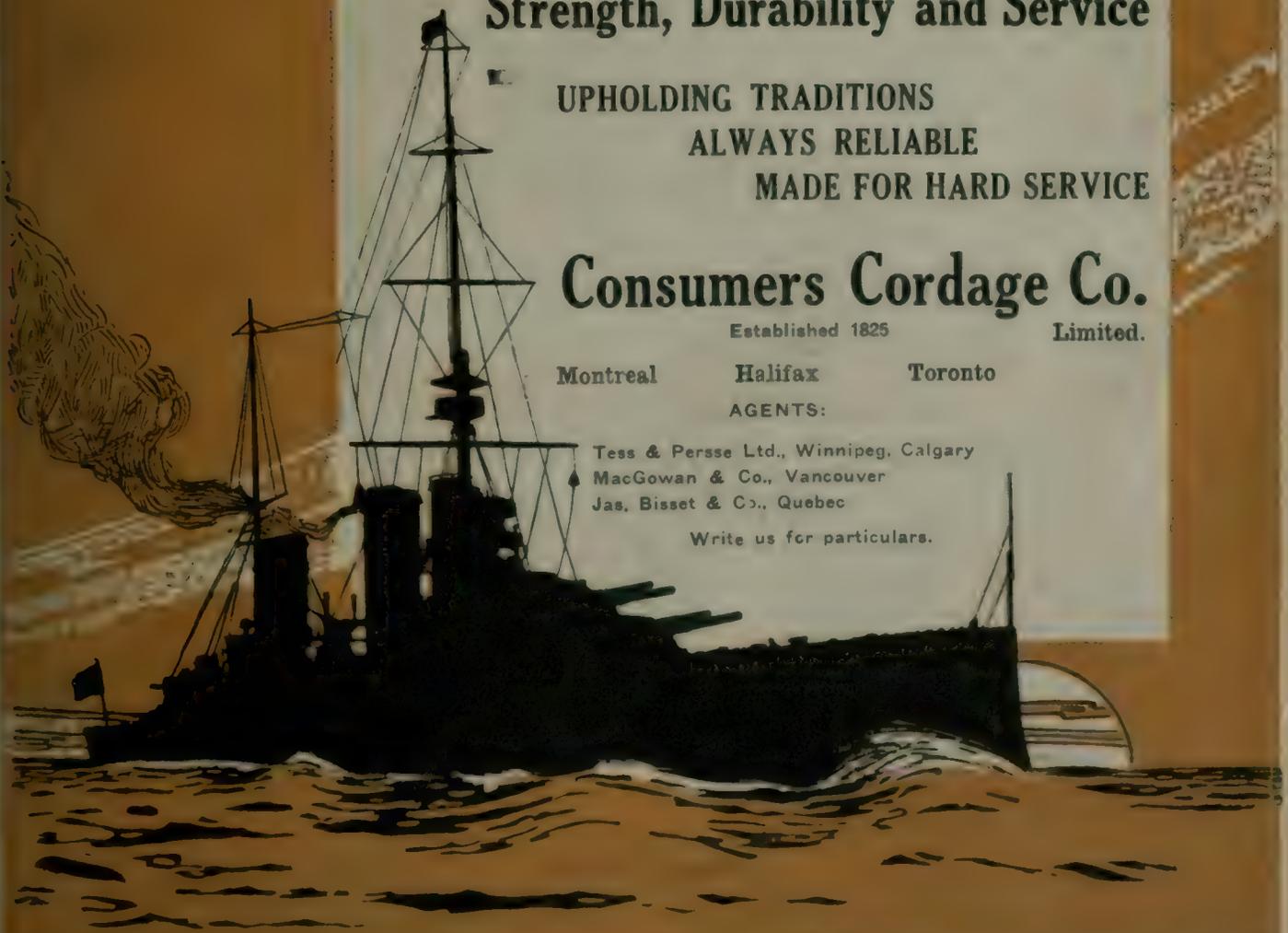
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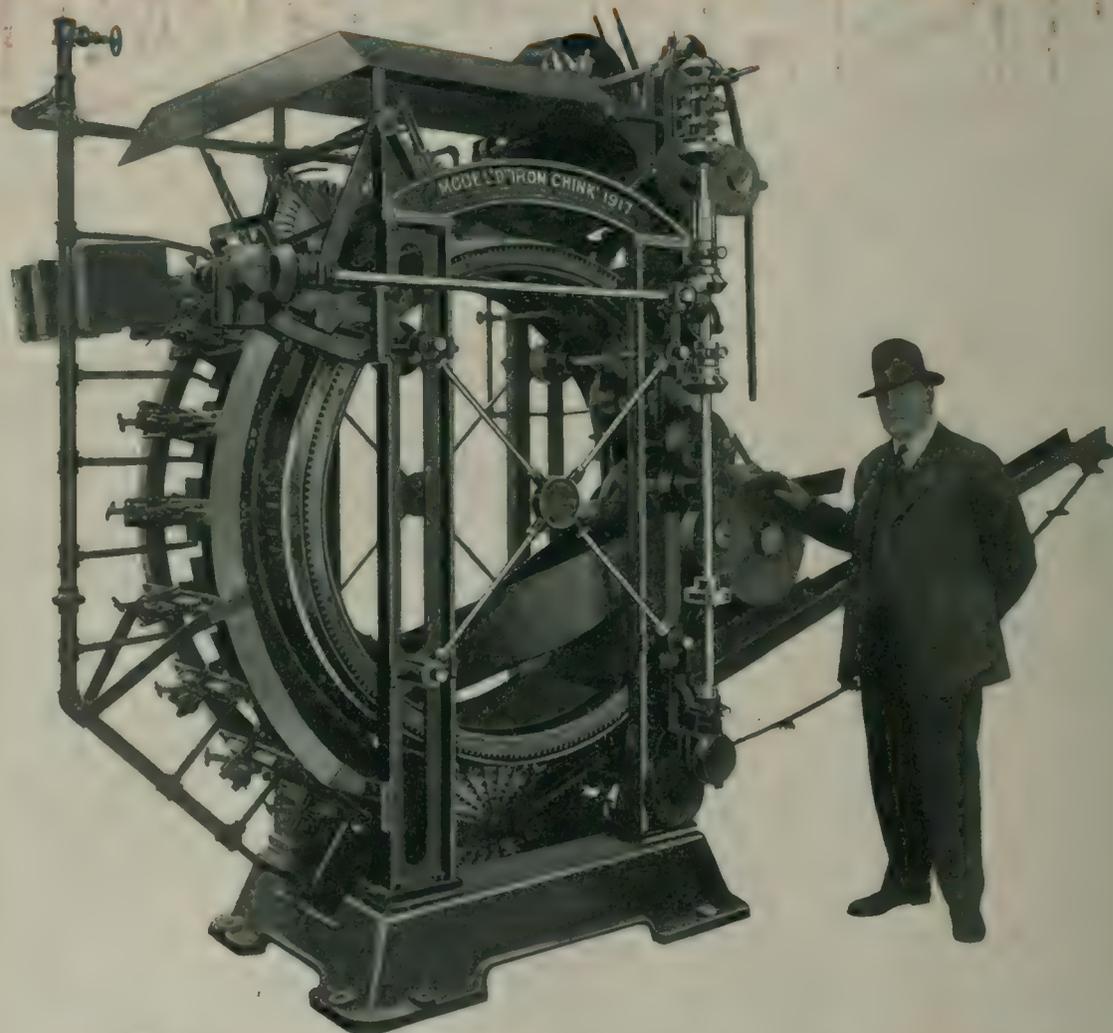
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These machines have proven themselves great labor and fish savers and a packing plant is not considered complete without one.

The above illustration shows our latest improved model—one that is far superior to any we have heretofore manufactured.

We are now taking orders for 1918 delivery. Full information, prices, terms, etc., furnished on application.

Smith Cannery Machines Company

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Office of the Minister of Marine and Fisheries. Ottawa.

To the Fishermen of Canada:—

Owing to our rapidly increasing home demand for fish, the quantities required for our soldiers overseas and for the domestic needs of the Old Country, the landings of fish in Canada are not equal to the demand.

As there is an abundance of fish in our waters, what is necessary is that the industry should be prosecuted with all the increased energy possible. This involves not only an opportunity to the fishermen, but a clear cut patriotic duty. Indeed, at this time, there is no more effective service that anyone who cannot actually undertake military duties, can render in furthering the interests of the war than to increase the food supply. Increased production on the land is needed, and is being effected, but for the land crops we must wait until they are ready. The fish are there now for the catching, and by each fisherman doing his part to increase the production, an adequate supply to meet all requirements will be produced.

Let no fishermen treat this as an impersonal matter. If each one leaves it for the other to exercise increased effort, nothing in this direction will be done. If, on the other hand, each will loyally accept this as a duty resting upon himself individually, the end in view will be achieved.

The ranks of the fishermen, like those of other callings, have been seriously reduced by enlistments, but I am confident that the country may rely on those who have remained to more than make up for the deficiency by persistent increased effort.



Acting Minister.

May 1st, 1917.

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TORONTO

To the Members of the C. F. A. and the Fishing Industry of Canada.

The question which should be uppermost in the minds of the members of the Canadian Fisheries Association is: What can we as individuals and as an Association do to win the war?

With this question in view the executive of the Association has entered on a six months campaign of education through the official organ **The Canadian Fisherman**, hoping to stimulate production and distribution so as to thereby relieve the strain on other food staples and also to provide for a larger surplus for the export to the United Kingdom, where there is an unlimited demand for all edible fish which we can spare.

The producer can assist this movement by adopting the most modern methods in the capture and care of this production which in many cases would mean greater volume and a higher grade of quality.

The distributor can also assist materially by using the most modern and scientific methods of handling and preserving the fish they distribute thereby preventing a considerable waste which now obtains, but should be eliminated; also it would mean a more satisfactory service to the consumer at no increased cost.

The development of the fisheries of Canada has been considerable during the past thirty-five or forty years, and more especially during the last ten years, but it has not by any means reached its limit.

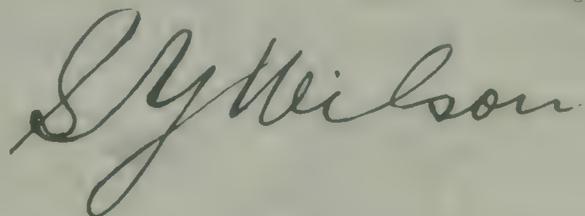
The problems that have already been met and solved will no doubt lead to a further development, but we anticipate, in fact, know that the future will present many difficulties that must be mastered if this great national natural resource is made to flourish and grow as it should, and will, if every member does his duty and keeps abreast of the times by a study of all the latest and best methods pertaining to his particular branch of the industry.

The obsolete methods of the past will not do for the future. Each succeeding year sees a greater demand for goods that are up to the standard, whereas it is more difficult to dispose of goods that are indifferent and lack uniformity.

During the educational campaign in **The Canadian Fisherman** there will be many articles and papers along the line of practical and technical training which I am sure it will well repay any one interested to read, mark, and carefully digest.

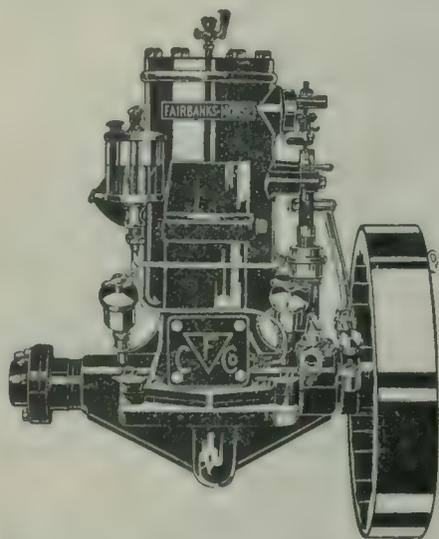
Our production last year is estimated at something like \$35,000,000 for all Canada. Our slogan should be \$50,000,000 for the next year.

Can we do it? Yes! If everyone interested in the industry puts his mind and energy unreservedly to it.



President, Canadian Fisheries Association.

Halifax, N.S., April 28, 1917.



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THE SCIENCE OF THE FISH CULTURE
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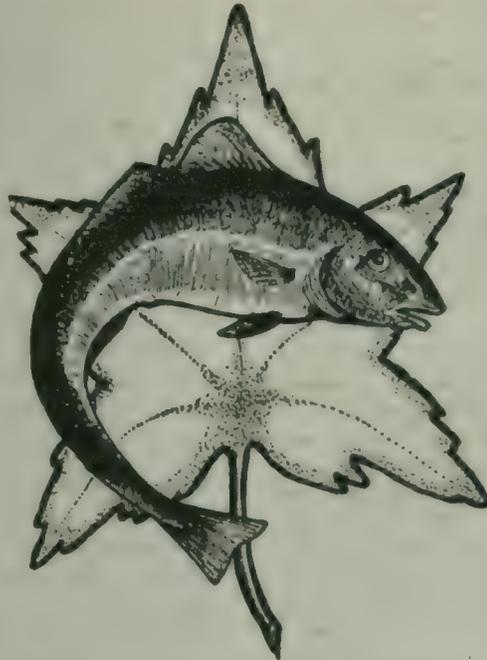
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Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, MAY, 1917

No. 5

INCREASE PRODUCTION OF FISH.

We are facing a critical period in our food supplies, and we cannot blind ourselves to the fact. True, we are not feeling the pinch as yet, but the day is coming when we will if we do not prepare now to meet it with increased production. The war is not yet won by the Allies, nor is there any prospect of it being ended this year. There is two years' fight left in the Huns yet, and the falling down of Russia will prolong the conflict.

Food experts are prophesying food shortage. It exists in several cases at present. Meat is becoming increasingly dear and scarce. Potatoes are also high, and far from plentiful. Both are, with bread, the staple foods of the Anglo-Saxon races, and bread has gone up, too. To produce all three takes time, labour and capital. They all depend upon the land.

There is one great food resource which we have that requires no tilling, seeding or preliminary investment to harvest. That is our fisheries. God put the fish into the seas, rivers and lakes. They are there yet, and can be easily harvested for the use of mankind.

Fish is the only substitute for meat. Canadians are recognizing this fact, and though not a fish eating people, are beginning to see that, with meat prices soaring, fish must take its place. The demand for fish in Canada is growing daily. A similar demand is coming from the United States, who, as our Allies, must be given a chance to take our surplus. A still more insistent demand for Canadian fish comes from Great Britain, who, unable to fish in her own waters and lacking fishermen, calls to Canada to supply the deficiency. Three cargoes of frozen fish can be shipped

from Canada in the time taken by a cargo of frozen meat from the Argentine and with less danger. The cost is also cheaper.

It is up to the fishermen and fish producers of Canada to "do their bit" now. Let every man who can fish at all get out on the water and harvest the finny food. Let the boat and vessel fishermen of both oceans and the inland waters keep at work fishing steadily without "knocking off" for rests and "spells ashore." Our fishermen, like other people, after a hard spell at sea, like a run ashore. Let them cut down the shore time. Keep the boats at sea. Land your catch and get out to sea again without wasting valuable time. Remember the boys in the trenches are getting no "lay-offs." The men in the Navy are getting but little shore leave. We're fighting an enemy who never slacks up, and who keeps a weather eye lifting for slacking up on our part.

Every day you waste means a loss in production. Bad weather is the only thing that should keep you from fishing. A day in port on a ten dory vessel, a fish tug, a boat fisherman, etc., means a loss of fish from 100 to 15,000 pounds—enough to provide a meal for at least 150 to 20,000 people.

Let us re-print part of an appeal to the British fishermen issued recently by the British Government. The same applies to us:

An Appeal to Fishermen.

FISHERMEN,—How fishermen came to the rescue of their country, how they kept in check the under-water attacks of the enemy, and all that they have done in the mine-sweepers and patrols, that is a tale that cannot be told till the war is over.

If the country is going to win the war, the country must be fed. Next to fighting for his country, a fisherman cannot do it better service than by fishing for it and bringing in food for its population.

On behalf of the Government, I ask you to increase your efforts; to follow up as far as possible those fisheries which produce the largest bulk of food for the people; to alter your fishing ways and customs, when necessary, according to the needs of the time; to fish all you know how.

Do not misunderstand me. I wish to drive no man to sea. A proper fisherman deserves his time off—his occasional trip ashore, or his night or two in—as much as any other man whose labour is hard and trying, provided that he does not by his absence cause others, who are willing, to stay in from sea. But, however hard we work, we usually find we can do still a little more if we make an effort. It is that extra effort I now ask you to make. Every landing of fish, however small, is a contribution to the food of the country. I ask you, therefore, as far as you can, to postpone holidays ashore—to fish hard, to fish for fish and fish for your country, too.

I ask it, feeling sure that the fishermen who remain fishing will respond to their country's need no less than those who are on Naval Service.

A COMMISSION WANTED TO INVESTIGATE B. C. FISHING REGULATIONS.

From British Columbia comes the news that the proposed changes in the federal fisheries regulations whereby the boat-rating on the northern rivers will be done away with and motor-boats permitted, beginning with next year, do not meet with the approval of the whole fishing industry.

The large majority of the packers in British Columbia think that these regulations will not only disturb and disarrange the business of canning salmon, but will also necessitate the outlay on the part of the canners of large sums of money with which to equip the fishermen with motors. In the main, the packers think that the enforcement of the proposed regulations will tend to decrease the supply of fish as well as shake confidence in the fishing industry as an investment.

While the packers will not admit that the proposed regulations are in the interest of the conservation of the fish and the fishing industry, yet they are prepared to say that even if these regulations are wise, which has yet to be proven, the third year of the war is no time to revolutionize the administration of the federal fisheries on the Pacific. In common with other basic industries in Canada, the fishing industry has had to meet and cope with many and varied difficulties consequent on the war. It has had to pay war prices for all materials that go into the making of preserved fish products. Freights have gone up. Labor is scarce and costly. What will happen after the war is over no one can say. Why complicate that problem by instituting new and drastic regulations

which do not meet with the approval of those who are vitally interested in the conservation of the fish and the permanency of the industry?

Strange though it may seem to the man who is not acquainted with the fisheries problems in British Columbia, yet it is a fact that the packers maintain that all they desire is a square deal and that they are emphatically not getting that square deal if the proposed regulations are put into execution. Thus it is that the official mind and the mind of the packers come into conflict. On the one hand you have the packers saying that the proposed regulations are not in the best interest of the industry and on the other, you have the official hand, as represented by the federal fisheries department, declaring that the proposed regulations are in the best interests of the industry and of the country. With the issue so clearly drawn, with each side so vigorous in its point of view, and with a great national asset at stake, is it not reasonable to assume that there may be truth on each side and that perhaps fundamental truth may be found in the middle way? How to get both parties to the dispute on that middle way is the problem to engage all who are fair-minded and realize how important it is to have Canada's natural resources developed on sane and proper lines.

We give ground to no one in our admiration for the work that the officials of the federal department of fisheries have done in protecting and encouraging the fisheries of British Columbia. Without exception, all the officials of that department, from the lowest to the highest, are imbued with their responsibility to conserve this national resource not only for to-day but for posterity. They are disinterested servants of the people of Canada and do their duty without fear or favor. Men like Deputy Minister DesBarats, and Superintendent Found, are fisheries experts, experienced and skilled in all modern methods of administration and intimately conversant with every phase of the fisheries problems of Canada. Their worth to Canada is incalculable. They have made the fisheries department of Canada one of the great public benefactions of the country and a model for other countries. But in the same breath we say that in dealing with a national and basic industry, the facts possessed by the members of that industry, which may not be within the view of the official mind, must be known and appreciated before any drastic regulations, which the industry says are detrimental to the development of the industry, should be imposed. That seems so simple as to appear as a truism.

The fishing industry of British Columbia as represented by the packers declare that the fisheries department at Ottawa has proposed regulations without first obtaining all the facts, the knowledge of which underlies all statesmanlike action, relative to the fisheries. They are prepared to furnish some of those facts and they ask for an opportunity of gathering other facts, and cross-examining the sources of the in-

formation received by the department that has led it to propound regulations that militate against the orderly progress of the industry, which, after all is said and done, it is fair to assume that they, with their large capital investments, have a right to see is made permanent and not too frequently subjected to vexations and unsettling governmental action.

In a word the packers of British Columbia ask that a commission of business men be appointed to investigate the British Columbia fisheries problems before the proposed regulations for 1918 are enforced. In the light of the statement of the case made, **The Canadian Fisherman** is of the opinion that the appointment of such a commission would be in the best interests of the industry and of the country. All Canada is interested in the fisheries of British Columbia, for they form a national asset, and a Royal Commission of influential business men taking evidence on oath and submitting a report to the Minister of Fisheries would do what is urgently desired, namely, adduce all the facts, make recommendations and lay the groundwork for future consistent development in the interest of all.

We anticipate the argument that such a commission would delay the enforcement of the proposed regulations. That would not be harmful, for a difference of a few months could do no great damage to the fisheries under rules and regulations that have these many years been productive of good. If the need for hasty enforcement of the proposed regulations is urged then there at once appears reason for a thorough investigation into the problem, for hasty regulation may be ill-advised and dictated to meet only a local situation rather than to survey the whole field.

It may also be urged that Royal Commissions never get very far. That all depends upon the commissioners as history will prove. The Federal Fisheries Commission appointed in 1905 to make an inquiry into the state of the industry on the British Columbia coast was composed of business men and resulted in stabilizing the industry for ten years, to the common advantage of all concerned. As an aid to the department and as an educational influence the work of another such Commission should be productive of good.

By all means let a Commission be appointed to look into the state of the fishing industry on the British Columbia coast and let the fisheries department stay its hand on its new regulations till all parties to the dispute have been heard and the evidence digested by business men as well as by departmental and industrial experts.

PISCATORIAL PARAGRAPHS.

Mr. F. E. Payson, of the Western Packers, Ltd., Vancouver, has just returned after making an extensive tour of Canada and the Eastern States. On his trip, Mr. Payson met the various fish people, and gave us a look-in, in Montreal.

A good move for aiding the sale of fish has been started by the D. Hatton Company of Montreal, who have had 150 display cases made according to the plan suggested by the Marine & Fisheries Department last winter, and which was published in the **CANADIAN FISHERMAN**. These cases are in the shape of a glass covered show case on legs capable of holding 75 to 100 lbs. of fresh fish on crushed ice. The Company loan these to their customers, and hope by their use to encourage the consumption and sale of fish, which in the past has been discredited by unsanitary methods and poor display. Mr. J. A. Paulhus, senior partner of the D. Hatton Company, is Chairman of the Publicity Committee of the Canadian Fisheries Association, and believes in living up to his title, and boosting the sale of fish.

A card from Mr. H. C. Walby, late of Prince Rupert, announces his return from Norway. He is now in business in New York.

Mr. Walter Lambert, Naval Architect, of Montreal, and a designer of fishing craft, has received the important appointment of Superintendent of Steel Shipbuilding under Col. W. I. Gear, Director of Steel Shipbuilding, Imperial Munitions Board. Mr. Lambert has closed his office temporarily, but will take up his work again at the close of the war.

The Lake Erie fishermen have struck tough luck this spring. The heavy spring gales played havoc with the gill-net fleet, and destroyed hundreds of yards of twine. Nets have been torn from their buoys and cast up on a lee shore; dragged across the steamer channels and fouled with clinkers, and one gang was raised with no less than 25 tons of drowned ducks in it. The birds were brought to Port Stanley and put through the fertilizer plant there. The herring is becoming scarce, and disease has struck the blue pike. The tug men, according to reports, are feeling blue over the season's outlook. The heavy weather and lake ice has hindered the pound net men in driving their stakes. The Lake Superior fishermen at the western end of the lake have been held up by ice, and only started fishing on May 15th.

The Ontario National Resources Commission has been formed to exploit and increase production in Ontario's resources. An effort will be made to increase the consumption of Ontario fish among the people of the Province.

There will be six of these big issues on Increase Fish Production. This one features British Columbia. The other provinces will be features in turn during the six months.

Mr. T. Craigie, Fort William; Mr. Chas. Finlay, Port Stanley; Mr. W. Crewe, Merlin; Mr. F. T. James, Toronto—representing the Lake fisheries—attended a meeting of the Ontario Resources Commission in Toronto on May 14th.

The Canadian Fisheries Association is booming these days. New branches have been formed; new members are coming in, and the organization is keeping tab of events and giving a helping hand where it will do the most good. The Increase Production Campaign is being run under its auspices, and with the help of its members.

THE MOTOR IN FISHING CRAFT.

One of the greatest aids for increasing production is the oil, gasoline or kerosene engine. Since their invention the fishing fleets of the world have been revolutionized, and the production of the fish greatly increased. Just what the motor has done, and what it is doing may be itemized as follows:—

(1)—It has lightened the fisherman's labor by taking the place of oars.

(2)—It has saved valuable time at sea by taking the place of sail and rendered the fishermen independent of the wind.

(3)—It has enabled the fishermen to make longer journeys off-shore to the fishing grounds, and therefore increased his sphere of operations and his opportunities for catching fish.

(4)—It has increased his catch, inasmuch as he can get to the fishing grounds quicker, remain fishing on them longer, carry a greater load, and get back to port in less time than by the sail and oar method.

(5)—It gives the fishermen more reliability in his work. It gives the fish dealer a steadier supply.

(6)—In the larger sailing schooners, as an auxiliary, it saves towage bills; enables the vessel to be manoeuvred in narrow channels; brings her into market quicker with the fish fresher; gives the dealers a chance to figure on her supply and time of arrival; less risk for dory fishermen in squally weather on the Banks, as they can be picked up quicker, and finally, it may save the ship and crew in clawing off a lee-shore.

In Canada, according to the last statistics, there were 9,302 motor boats in the fisheries; 225 steam vessels; 1,236 sailing and motor vessels of the larger type; 431 carrying smacks, and 29,842 boats using oars and sails—a great field for motor development. In the previous year, there were 8,700 motor boats, which shows that within a year 602 motor boats were added to the fleet. The increase in motor boats within two years was 3,391—an enormous development. The motor engine in the fishing industry has come to stay, and its universal adoption will result in the development of the fisheries.

LEONARD FISHERIES, LTD., NOW OPERATING.

An important advance in the development of Canada's Fishing Industry on the Atlantic coast is the consolidating of several old established Canadian fish producers into the Leonard Fisheries, Ltd.—a million dollar corporation which commenced active operations under that name on May 1st.

The old established firms of Leonard Bros., of St. John, N.B., Montreal and Grand River, P.Q.; A. Wilson & Sons, of Halifax, N.S., and Matthews & Scott, of Queensport, N.S., form the new corporation, and the Leonard Fisheries, Ltd., is now operating their plants at St. John, N.B.; Grand River, Canso, Port Hawkesbury, North Sydney, Queensport, Eastern Harbor and Halifax, N.S., with head office in Montreal. The firm have purchased the \$250,000 cold storage plant at Port Hawkesbury, formerly operated by the North Atlantic Fisheries, Ltd., and this will be used as a receiving cold storage for fish in conjunction with their distributing cold storage at the Montreal sales office.

The corporation intend developing the Atlantic fisheries on modern and up-to-date lines, and in addition to utilizing boats and schooners for producing fish, intend to operate steam trawlers to maintain steady supplies just as soon as they can be purchased or built.

The best efforts of the directors will be put forth to improve the handling, curing, packing and distribution of fish for the Canadian market, and every facility for improving these items will be utilized.

The officers of the company represent men who are practical in every particular, and who have been brought up in the fish business. They are: Walter F. Leonard, St. John, N.B., President; D. J. Bryne, Montreal, Managing Director; S. Y. Wilson, Halifax; R. T. Matthews, Port Hawkesbury, and W. P. Scott, Queensport, Directors. Mr. Byrne is also on the Directorate.

With officials of their calibre and experience, the future of the Leonard Fisheries, Ltd., is in able hands, and is assured of success. They have our best wishes.

CANADIAN FISHERIES ASSOCIATION ACTIVITIES.

The Transportation Committee of the C. F. A. met members of the Express Traffic Association in Montreal on Wednesday, May 16th, and discussed the question of standard sized fish boxes from Maritime points. The C. F. A. Committee felt that it was not possible at the present time to reduce the weights of the boxes below 250 lbs. nett weight, as the extra cost would have to be added on to the consumer, and such was not desired. However, the fish men promised to assist in gradually reducing the weights, and urged that the I. C. R. put on an Express Refrigerator Car service from eastern points daily. A conference between the railroad companies and the C. F. A. to discuss service and refrigerator cars will be held shortly.

OBITUARY.

Mr. Alfred Sheriff, Deputy Minister of Game & Fisheries for the Province of Ontario, passed away on May 14th at his residence in Toronto, after a long and painful illness. Mr. Sheriff was a native of the Channel Islands, and at the time of his death was only 47 years of age. He leaves a widow and four children.

Coming to Canada many years ago, Mr. Sheriff was, for a time, engaged in newspaper work, and on the staff of the Toronto Mail and Empire. On entering the Civil Service, he became Secretary to Hon. Dr. Rheaume, former Minister of Public Works in Ontario, and latterly Deputy Minister of Game & Fisheries for the Province.

Mr. Sheriff's work brought him in touch with the commercial fishermen of the Lakes, and his sympathetic interest in their affairs, and his ready understanding of their difficulties made him a very popular official. His administration of Ontario's fisheries was conducted in the most intelligent and capable manner, and his relations with the fishermen and the fisheries officers were most cordial. He will be greatly missed.

We extend our sincerest sympathies to Mr. F. E. Payson, of the Western Packers, Ltd., Vancouver, who lost a help-mate and a good "pal" when his wife, Evelyn L. Payson, passed away in the Homoeopathic Hospital, Boston, Mass., on April 3rd, following an operation. The late Mrs. Payson was a native of Cambridge, Mass., and married Mr. Payson 20 years ago.

CANADIAN FISHERMAN

MONTREAL, MAY 21, 1917

TO THE READER:-

Write your name and address plainly in the blank below, tear out the page, fold in it a dollar bill and forward both to us. In return we will send you THE CANADIAN FISHERMAN for one year.

In this way you will get much valuable information concerning Canada's Commercial Fisheries, which, next to agriculture is her largest source of food and wealth.

You will also thereby be assisting in the development of this resource, because this issue of the CANADIAN FISHERMAN is the first of a series of six special issues that are being published in connection with a special effort which the Canadian Fisheries Association is making during 1917 to

First: Encourage the fisherman to produce as much fish as possible immediately so as to increase the country's food supply.

Second: Make Canada's food fishes better known and more appreciated by her own people, so that in ordinary times the industry will not have to depend so much upon foreign markets.

(Signed), F. W. WALLACE,
Editor of The Canadian Fisherman.
and
Secy. Canadian Fisheries Association

To F. W. WALLACE,

Date.....

48 St. Alexander St., Montreal.

Enclosed you will find the sum of One Dollar for which send me The Canadian Fisherman for one year from date.

Name.....

Address.....

Navigation for Fishermen

Written Specially for Fishermen and the Requirements
of Fishing Craft.

No. 1. The Compass

By FREDERICK WILLIAM WALLACE.



THE science of navigation is of the utmost importance to the fishing industry—especially in the deep sea fishing off our coasts where the fishing grounds are out of sight of land. Without a knowledge of navigation, the fisherman in command of a vessel, if he has nerve enough to take command, is as useless as the Dutchman's anchor.

In Canada, we are up against a dearth of men capable of skippering off-shore fishing craft. We have hundreds of smart young fishermen, good fish killers and experienced seamen, but having little or no knowledge of the navigational science. This lack of knowledge prevents them from taking command. They are afraid to sail out of sight of land and get lost, and they have no confidence in their ability to take a vessel out to the fishing grounds and bring her back again. Could these young men be given a chance to learn elementary navigation by a system of navigation schools established by our Government at certain localities around our coasts, we could have more men for skippers and better fishermen.

The fishing skipper of today must be an expert in everything that pertains to his profession. He should have a first class knowledge of marine biology—that is, of fish life, their spawning seasons, their food, their feeding grounds, their habits, and their value as food fish. He should have an intimate knowledge of the fishing grounds, the composition of the bottom, the depths of water on them, currents, tides, and water temperature. The care and handling of fish, proper icing and salting, and the value of the by-products such as livers, roes, tongues, sounds, heads and offal—all of which are worth money if properly utilized—are subjects upon which he should be an expert. And of just as great importance is a knowledge of navigation, for without it, he cannot find the fishing grounds or handle the ship properly in the many situations which crop up at sea.

The writer has known many smart fishing skippers who have wasted valuable time through poor navigation. They could fetch an off-shore Bank alright, if conditions were favorable, but if a blow came on and they were hove-to for any length of time, they would lose the grounds altogether and have to run in and sight the land again in order to make a new departure. For coasting, where they knew the land-marks, they couldn't be beaten, but when off-shore and with only the lead to give them an idea of their whereabouts, if they lost soundings, they were literally "all at sea".



THEN again, in heavy breezes, or when the barometer portended bad weather, they would stand in for a harbor to escape a "dusting." Probably a dense snowstorm would shut down before they made the land. In that case, the skipper, none too sure of his position and his navigational abilities, would "lay her head off-shore" and take the breeze outside. He may be hove-to for days and have drifted a hundred miles. When it faired up again, his decks may have been swept, dories smashed, gear gone, or it may take him so long to beat back to the fishing grounds that the bait was rotten, water tanks empty, grub running low, and it was time to get home. The result is a "broker" trip and no money for fishermen or owners.

A poor knowledge of navigation keeps many a smart fishing skipper fishing only in waters that he is acquainted with. Many a man can fish successfully in Hecate Straits or on Browns', Roseway, Sambro, and Canso Bank, but who would be afraid to tackle the trip to the Gulf of Alaska grounds or in the Gulf of St. Lawrence or the Labrador. That, to him, would be getting too far from home. Yet, if he only had the knowledge, it is just as easy to take a ship from Vancouver or Prince Rupert to Cape St. Elias or the Shumagin Island grounds, or on the Atlantic, from Digby, Halifax or Canso to the north shore of Anticosti or the Labrador, as it is to make a local run of a hundred miles.

All this keeps the supply of fish down. The man who loses the fishing berth in a breeze loses a lot of fish. The vessel beating about trying to make a Bank after being hove-to outside when she might have been in a handy port, loses valuable fishing days getting back to the grounds. The man who can only fish in waters he is acquainted with could make more money and catch more fish if he could travel further to new grounds. It works in a hundred ways which needs no further explanation. Every fisherman knows the value of navigation and a good knowledge of it.

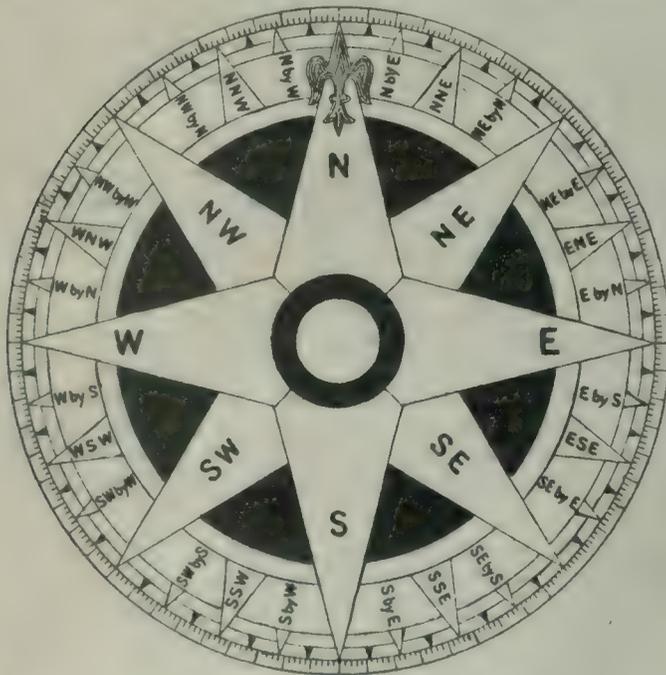
The first thing a young fisherman must know is the compass. Without it, no sailor or fisherman could get anywhere, yet there are plenty of men taking a wheel today and steering a trick who have only the faintest knowledge of its functions and make-up. The writer has known men take a wheel and who could steer "through the eye of a needle", who didn't even know all the points of the compass card. They saw a certain black speck on the compass card pointing at the lubber's mark, and they knew how to turn the wheel to keep it there, but if they lifted their eyes from the binnacle for any length of time, or the ship gave a wide yaw, they lost the course and would have

the ship steering anywhere but on the right point. Such men steered best by the wind or with a star inside the fore-rigging, but their compass steering was decidedly precarious.

The writer does not claim to be an expert on navigation, and these articles are not for the sailor who knows all about it. This is written for the fisherman who is anxious to improve his knowledge, and there are many, and who has never had a chance to get the ground-work. All the books on navigation today are written by scientists who will persist in writing in words not easily understood by the man with a limited education, or else by sea captains who are anxious to show their command of scientific and astronomical terms, and as a result they talk right over the heads of their students. One would need a dictionary to translate their meanings.



EVERY fishing craft has a compass. In the large steam vessels it is contained inside a brass or copper stand called a BINNACLE which is lighted at night by either two oil lamps fixed at each side of the binnacle hood, or by an electric light fixed underneath the compass card. Some steam fishing vessels have no binnacle stand, but have the compass placed up in the ceiling of the wheel-



house. On schooner fishermen, and other sailing craft of the larger type, the compass is placed inside the cabin house abreast of the wheel, and there is a hole cut in the planking through which the helmsman views the card. The compass card is lighted at night by means of a lamp inside the cabin. Many fishing schooners, notably those of the Lunenburg fleet, have the compass contained in a wooden binnacle placed on top of the cabin house—usually on the starboard side of the cabin gangway and abreast the wheel. In all fishing schooners the compass is placed in the starboard binnacle as a general rule. In smaller craft, sloops, motor-boats, and dories, the compass is contained in a plain wooden box and may be placed wherever it is handiest for the helmsman to see.

Compasses may be of two kinds—DRY or LIQUID. The dry card is only useful for navigators when it is of large size—otherwise it swings too much with the motion of the vessel. The liquid compass is the best

of the small sized compasses used aboard fishing craft. In this compass, the card is suspended in liquid and its motion is slower. The larger the compass, the better. A small compass is a poor thing to steer by and one would need eye-glasses to see the points.

It is not my intention to confuse the reader with the whole scientific make-up of the compass. That knowledge is alright for the master of a liner, but for the fisherman it is sufficient for him to know that the NORTH POINT of the compass card points to the MAGNETIC NORTH—not the TRUE NORTH. Keep that fact in mind.



THE compass card is divided into POINTS. Starting from the NORTH POINT on the card and going round to the north point again, either way, there are THIRTY-TWO POINTS each of which have a name. Commencing with NORTH and following the easterly part of the card, we have EIGHT points between NORTH and EAST, namely:

NORTH	Written N.	
NORTH by EAST	" N. x E.	1 point
NORTH NORTH EAST	" N.N.E.	2 points
NORTH EAST by NORTH	" N.E. x N.	3 points
NORTH EAST	" N.E.	4 points
NORTH EAST by EAST	" N.E. x E.	5 points
EAST NORTH EAST	" E.N.E.	6 points
EAST by NORTH	" E. x N.	7 points
EAST	" E.	8 points

Looking at the compass card you will notice that these eight points are exactly one quarter of the whole circle of the compass. The other three quarters are composed of eight points in each also and they are named in a similar manner. Thus we continue around the circle:

EAST by SOUTH	Written E. x S.
EAST SOUTH EAST	" E.S.E.
SOUTH EAST by EAST	" S.E. x E.
SOUTH EAST	" S.E.
SOUTH EAST by SOUTH	" S.E. x S.
SOUTH SOUTH EAST	" S.S.E.
SOUTH by EAST	" S. x E.
SOUTH	" S.

This completes one-half of the compass points—sixteen points in all. The whole thirty-two points of the compass are as follows:

NORTH	0 points	0 Degrees.
NORTH by EAST	1 point	11¼ "
NORTH NORTH EAST	2 points	22½ "
NORTH EAST by NORTH	3 points	33¾ "
NORTH EAST	4 points	45 "
NORTH EAST by EAST	5 points	56¼ "
EAST NORTH EAST	6 points	67½ "
EAST by NORTH	7 points	78¾ "
EAST	8 points	90 "
EAST by SOUTH	9 points	
EAST SOUTH EAST	10 points	
SOUTH EAST by EAST	11 points	
SOUTH EAST	12 points	
SOUTH EAST by SOUTH	13 points	
SOUTH SOUTH EAST	14 points	
SOUTH by EAST	15 points	
SOUTH	16 points	180 "
SOUTH by WEST	17 points	
SOUTH SOUTH WEST	18 points	
SOUTH WEST by SOUTH	19 points	
SOUTH WEST	20 points	
SOUTH WEST by WEST	21 points	
WEST SOUTH WEST	22 points	
WEST by SOUTH	23 points	

WEST.	24 points	270 Degrees.
WEST by NORTH....	25 points	
WEST NORTH WEST	26 points	
NORTH WEST by WEST .	27 points	
NORTH WEST..	28 points	
NORTH WEST by NORTH .	29 points	
NORTH NORTH WEST ..	30 points	
NORTH by WEST	31 points	
NORTH	32 points	360



THE whole of the THIRTY-TWO POINTS of the compass are given in this table and they should be learnt off by heart. Don't gabble it off like a parrot, but study the compass card illustrated here, or the compass on your vessel, and commence with the principal points first such as NORTH, EAST, SOUTH and WEST. Then memorize one quarter of the compass, then another; and finally the whole card, until you know them all and can "box the compass" either way and from any point. There is nothing difficult in it, and you will find after mastering the first eight points that all the others are easy.

You will notice that the table also gives degrees. In addition to points, the compass is also divided into degrees—that whole circle making 360 degrees. One point is equal to $11\frac{1}{4}$ degrees; four points 45 degrees; eight points 90 degrees—otherwise a right angle—and so on until the whole circle is traversed up to 360 degrees.

While it is not necessary for steering on fishing vessels, yet it is well to know the degrees in laying off courses and taking bearings, and each quarter of the compass should be memorized with the degree for every point. There are only eight points in every quarter and $11\frac{1}{4}$ degrees to each point; two points $22\frac{1}{2}$ degrees; four points 45 degrees; eight points 90 degrees. The points between these are easily memorized.

In large steamers, steering is usually by degrees instead of points, and the courses are usually given in degrees such as "North 47 degrees East." On a fishing vessel this course would be given as "North East one quarter East" which brings us into another division of the compass.



YOU can readily understand that were the sailor to steer on courses of the thirty-two points only, the steering would be rather broad. The skipper, who, on a vessel out on Quero Bank, says: "Our port lays to the west'ard. Steer west!" is liable to fetch up on the Nova Scotia coast anywhere within fifty miles of the home port. In order to steer finer courses, we can head the ship to a quarter of a point if necessary.

All fair sized steering compasses are marked with the full thirty-two points and the quarter points. That is each point is divided into four quarter points marked on the compass card by an arrow head or a nick. The compass illustrated in this article shows the half points only, but the quarter points will be found on fair sized compass cards and we illustrate a section of one herewith. By these quarter points we are enabled to steer finer courses, and taking the first point from North to North by East, we have the quarter points:

- NORTH $\frac{1}{4}$ EAST
- NORTH $\frac{1}{2}$ EAST
- NORTH $\frac{3}{4}$ EAST

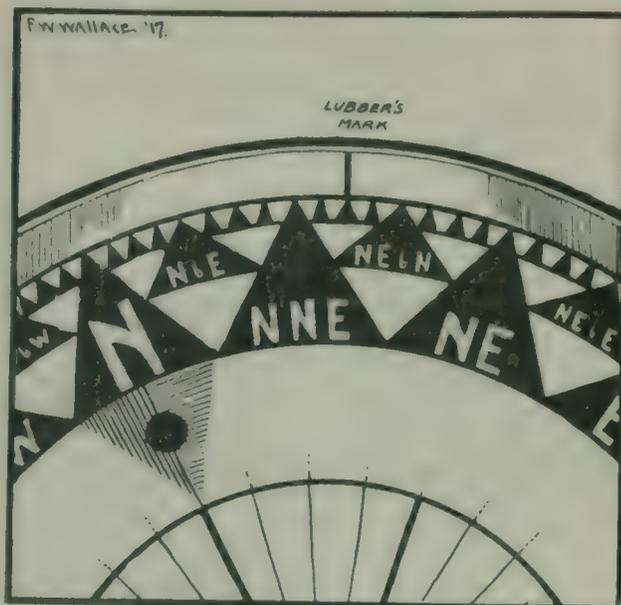
then comes, of course NORTH by EAST. In rotation, the others follows:

- NORTH by EAST $\frac{1}{4}$ EAST
- NORTH by EAST $\frac{1}{2}$ EAST
- NORTH by EAST $\frac{3}{4}$ EAST

and then the point NORTH NORTH EAST and so on.

Whenever possible call the quarter point by the last name of the point. Thus, S.W. $\frac{1}{2}$ W. instead of S.W. by W. $\frac{1}{2}$ S. or N.W. by W. $\frac{1}{4}$ W. rather than W.N.W. $\frac{3}{4}$ N. Both mean the same thing and indicate the fractional point, but it doesn't sound right to a sailor. You will notice that "Nor'west by west three quarters west!" sounds better than "West nor'west a quarter north!" In naming some of the quarter points, just remember that little rule. Of course this cannot be done at all times as for example the N.E., N.W., S.E. and S.W. points. A half point north of N.E. is N.E. $\frac{1}{2}$ N. and so on.

This article covers the actual compass fully enough for the fisherman's purpose. The main thing is to



Drawing showing quarter points. Compass pointing N.N.E. $\frac{1}{2}$ E.

memorize the points and be able to box the compass, and name the quarter points intelligently. A little study and observation of the compass card, and the whole thing is easily mastered. Remember! The compass North points to the Magnetic North. There are thirty-two points. Each point is divided into four quarter points. There are $11\frac{1}{4}$ degrees in each point; 45 degrees in four points; 90 degrees in eight points or one quarter of the compass circle, and 360 degrees in the whole circle of 32 points.

(Another article will be published next month).

WEIGHTS OF FILLED SALMON CASES.

	Cans.	Weight.
Case of No. 2 size cans,	24	48 lbs.
Case of No. 1 size cans, talls,	48	70 "
Case of No. 1 size cans, flats,	48	68 "
Case of No. 1 size cans, oval,	48	70 "

Export shipping measurement of Salmon Talls are $10\frac{1}{4}$ x 19 x 20. Cubic measurement, 1 foot 6 inches.

House of Commons

Ottawa

To the Fishermen of Canada:—

The demand for increased production of food is becoming more urgent day by day. It is the opportunity of a lifetime for the Canadian fishermen. It is not only an opportunity to make money, for prices are good, but one to strike a blow for the cause we all have at heart. No class of our population has made greater sacrifices in the present war. There is scarcely a harbour or a hamlet on the coast of the Maritime Provinces, but has its representatives in the trenches. This is only an additional reason, if one were necessary, why those who stay at home to man the fishing fleet should strain every nerve in order that the food supply should be kept up.

The great importance of this phase of the war was emphasized a few days ago at Washington by Hon. Mr. Balfour, the British Foreign Secretary. He pointed out that one of the main dangers to the allied cause is the probable failure of the food supply. In this matter Britain is not only concerned about food for her own soldiers and her civilian population, but for the Allies as well. She has agreed to share her last loaf with her Allies. Our young and vigorous men here in Canada, with red blood in their veins, will want to follow their comrades to the front, but there will still be men left to man the fishing fleet, and it may well be, that the man who day by day, as the result of the special energy that he puts into his task, adds an extra barrel of mackerel or an extra quintal of cod to the common stock, is doing as much to win the war as the man who is wielding the bayonet in the trenches in Flanders.

Everybody knows that most of the European fishermen have been put out of business. Of

the three thousand trawlers and thousands of other smaller crafts operating in the North Sea and adjacent waters before the war, there are few indeed left. They have become U-boat hunters and mine sweepers. Their crews in the meantime have become jolly tars, and their skippers are wearing the King's uniform.

The men who man the "little grey ships" have done splendid work. They have braved the darkness and the ice-cold winds and storms during the last three winters. They have captured and sunk those hyenas of the deep by the score, and I doubt not that when the history of this struggle comes to be written they will be found to be the heroes of the war.

Be that as it may, this condition of affairs furnishes another strong reason for special effort on the part of Canadian fishermen. Let us hope that a determined effort will be made to add at least from 25 to 50% to last year's catch; and, while the farmers and munition workers all over this continent are being successfully appealed to for an increased output, let it not be said that the Canadian fishermen have fallen behind in the hour of their country's need.

Today, people are asking themselves everywhere if we who remain safely at home are worthy of the sacrifices that are being made for us. Men have died in France, in Flanders, at Gallipoli, on the Tigris, on the high seas—died by thousands and tens of thousands. They have staked their lives and their hopes in millions. What for? Surely not merely that we who are left should escape what they have endured. We should be unworthy to be called citizens of the country for which these men died, unless their example made us willing to spend and be spent in the common cause.



M.P. for Guysboro, N.S.

April 26th, 1917.



The B. C. Salmon Canning Outlook



THE East is East and the West is West, and never more so than when one discusses the fishing industry. Yet if the twain are ever to meet, and everyone agrees that they should meet, it is necessary that the strong hand of publicity be called in to enlighten the East regarding the problems of the West. Happily that hand is present in the Canadian Fisheries Association and its official organ, the CANADIAN FISHERMAN, whose merits Mr. J. J. Harpell, President of the Industrial and Educational Press, Limited, has recently been exemplifying with such success on this coast. From now on, it is hoped that the industry on the Pacific coast will be put and kept in touch with the brethren in the fraternity in the rest of Canada.

Not all is rosy with the fishing industry in British Columbia for the war has had its effect here as elsewhere, in making labor scarce and materials high in price and hard to get at any price. The new scale of wages to the Halibut fishermen has greatly increased the cost of this fish and added to the risk that the producers must ever run in deep-sea fishing, where adverse weather conditions play so important a part in making good catches. And, whether the weather is fair or foul, the expense of keeping large steamers in operation goes on without let or hindrance. If the cold storage men could get all the fish they wanted at all the times they want it, their would be a happy life. But when a big schooner is out for three weeks and returns with only 20,000 lbs., as did one of the New England's fleet the other day, then there is woe and lamentation. The high price of 17¾ cents a pound for halibut at Prince Rupert in the first week in April is an index of what the independent halibut fishermen make out of their fishing, and what the big producers have to pay for fish in the open market when they have to buy to make up the supply to fill their orders from the east. Some producers say that the fishermen make all the real profit in the deep-sea business.



AND the salmon canners are not without their troubles also and chiefly over the possibility of there not being a sufficient supply this year to satisfy the demand and keep the canneries going at profitable capacity. There is much doubt whether the big year on the Fraser will materialize this year, as is due. This doubt has caused the canners to buy with caution, so that if the big run really does come, they now find themselves unable to get guarantees of further supplies before September, which will be too late. The effect of this situation will bear most heavily upon the smaller canners for they

are not financially able to risk tying up large sums in supplies of canning material when they have no certainty that they will be able to use them, and especially when canning material is perishable. The larger canners are giving much thought to this question and never before in B. C. has there been so much uncertainty in the business.

The matter of supply is always a consideration with the canners, not only for the present season but also for years to come. It is upon the certainty of the supply of salmon that the permanency of the industry depends and to the securing of that permanency, every canner devotes much time and care. Thus it is that there has arisen a demand for the imposition of an embargo on raw salmon going into foreign points for the canners claim that they could use all the salmon caught in the B.C. waters in their own canneries and cold storages. This would give them on the Fraser and in the waters of Vancouver Island additional supplies of salmon and add to the fish production of B.C. Such an embargo is opposed by the fishermen of the Fraser for they claim, and their claim is true, that the foreign buyer is prepared to pay higher prices for the cheaper grades of salmon than is the B.C. canner, although the B.C. cold storage man offers close competition to the foreign buyer of raw salmon.

The foreign buyer represents foreign packers who by using traps and seines, which are not allowed on the Fraser, in their own waters get the bulk of their pack at prices per fish that are much lower than any prices paid in B.C. They can then afford for the smaller part of their pack, to maintain buyers in B.C. waters who will pay higher prices than the B.C. canners can profitably pay. This is so, also because the foreign packers have highly protected markets for all their pack which are practically closed to the B.C. packers. The request for this embargo was not listened to by Ottawa though the demand for it still persists and may come up again in another way later in the season, for as the cheaper grades of fish do not run in any numbers till late in August or early in September it is thought that more mature consideration may be given to it before that time.



THE supply of salmon on the Fraser is viewed also from a larger angle by men like Mr. H. Bell-Irving of the A.B.C. Packing Co. He believes that the supply is so threatened with depletion that the only hope for the river is to close it to all fishing during 1918, 1919 and 1920. There is no doubt that a serious condition does exist, as was pointed out by the federal commission appointed in

1905. It may be that the broad policy advocated by Mr. H. Bell-Irving is the proper course to pursue. This year may add weight to his arguments already so forcefully presented at Ottawa, but so far, Ottawa is not persuaded.

It is an axiom that if the salmon are allowed to get to the spawning grounds, and those grounds are freed from obstructions, and the fish unmolested while spawning, the natural increase of the fish would keep up the supply and perhaps justify more extensive fishing. Ottawa has paid much attention to this task but to the thinking of many canners not enough. This is a fruitful field for the government to work in, in co-operation with the canners, and it is even suggested that greater efforts be made at once to clear all the spawning streams of obstruction even if it should cost money. The canners are prepared to share the expense with the department. This is proper conservation and should be considered.

The high cost of production is the practical matter that is giving the canners concern at this time just as the season is about to begin. Tin-plate never was so high before and never has there been such difficulty in making sure of shipments. This difficulty is augmented by the fact that the U.S. is now at war in line with the Allies and of necessity steel will be more than ever in demand for making munitions. While the price of tin, which is obtained from the United Kingdom, enters somewhat in the price of tin-plate, yet the determining element is the price of steel billets. If the demand for steel billets is great for the purposes of the war, then their price soars so far as the tin-plate makers are concerned.

There is at present a movement on foot in the U.S. whereby it is expected that the government will make it incumbent on the steel producers to see to it that the supply of steel billets is kept up to the tin-plate producers, for it is pointed out, with great show of force, that the canning industry not only as it is represented by the salmon canners but also by the vegetable and meat canners, is a necessary adjunct to the military organization, as food stuffs can be more readily handled in tins than in any other way.

 THIS is all very well so far as the future is concerned but what interests the salmon canner on the Pacific coast is the fact he has to pay to-day \$10 for what cost him at the beginning of the year around \$5.75, when contracts are usually made, and even at that price, he must be content with the statement that no shipments will be guaranteed till September. Happily, however, most of the canners figured on their supplies earlier in the season and have no need to go into the market and buy tin-plate to-day. There are cases of new canners who failed to buy at the proper moment and who have been forced to delay operations on the Fraser this year because they could not get deliveries of tin-plate. The situation is in no way due to the makers of tin-plate but is solely caused by the unprecedented demand for tin-plate owing to the war.

What is true of tin-plate is true also of other supplies needed by the fishermen. Nets that cost \$175 last year cost \$300 this year and the supply even at that price does not meet the demand. Some of the canners find that the nets that they ordered last year are still in England and they are not sure that they will reach this coast before the fish begin to run.

It is estimated that on the average the cost of pro-

duction this year will be fifty per cent. over last year. Besides that the recruiting efforts have been so successful in B.C., that the problem of labor and fishermen is acute. Most of the able-bodied white, native-born and British-born fishermen have enlisted and are either overseas or in training. The result will be that fishing will have to be done by inexperienced and therefore inefficient fishermen, which will mean additional cost to the packers.

The bright side of the shield, however, is that the demand for canned salmon keeps up and the prices rule high. The buyers of canned salmon buy at their own risk f.o.b. the cannery wharf, for the most part, and their troubles are to get space in ships to ship their purchases to their destination. Space that cost 50 shillings before the war now costs 200 shillings and is to be had only after much waiting. Most of the B.C. packers have already sold all their pack, yet to be put up, that they desire to sell, believing it good policy to take a fair price now and let the buyer have any increase that may arise later in the season.

While there is no doubt that the fishing industry is one in which a good manufacturer's profit can be made if good business judgment is exercised and it is viewed in terms of four-year cycles, yet the uncertainty of the runs of fish, the peculiar labor conditions existing and the excessive cost of all materials that go into the making of canned fish, render the industry one fraught with many obstacles that only expert knowledge and good luck can surmount.



BESIDES that, the industry this year is worked up over the changes made by the Department of Fisheries at Ottawa and by the proposed policy of the Department for the year 1918. These changes, in the opinion of the salmon canning industry as a whole, revolutionize the fishing business. They will, it is said, necessitate many and expensive readjustments of administration and operation and yield little or no compensation to the canners. In their opinion, the time for their enforcement is inopportune in this the third year of the war, when every resource at the disposal of the industry is devoted to the problem of increased fish for food production, even in the face of conditions that, were it not for the war, might warrant more cautious operation.

Furthermore, it is urged that the proposed new regulations are based on insufficient evidence and do not take into account the large sums of money invested in the industry on this coast but rather cater to a tendency that will render the industry unstable as an investment and likely deplete the supplies of fish through over-fishing.

While objection is made to the announced policy of the Department in granting yearly one additional license for a cannery on the northern streams if the supply of fish warrants it, on the ground that there are already enough and more canneries to take care of all the fish caught and that few canneries in B.C. are run to capacity, yet the main opposition arises over the proposed new and, to the canners, disturbing regulations, that will be put in force at the beginning of the year 1918.



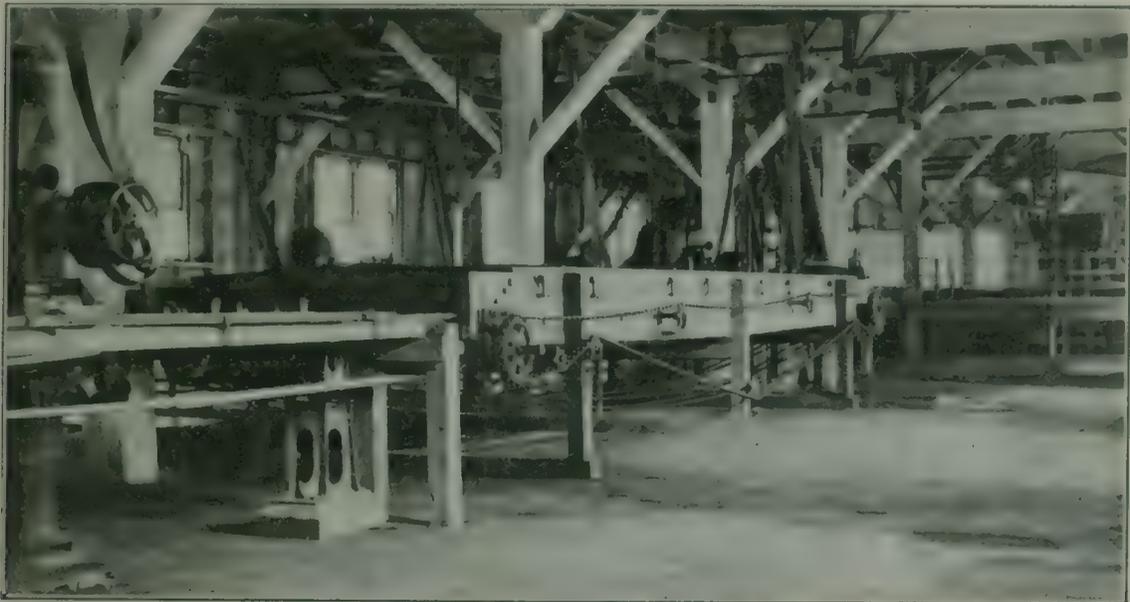
ONE of these proposed regulations is: First, the abolition of all attached boat licenses on the northern streams of British Columbia making them like the Fraser River where the fishermen are all independent of the canneries. The

rule has been on the northern streams to have a certain number of boats with fishermen attached to each cannery, while of course, there were a number of independent white fishermen, yearly increasing, who could sell their catches to anybody who wanted them.

And the second of the proposed regulations is that permission is to be given for the use of gasoline boats in fishing operations on the northern streams.

The result of the first regulation, relating to unattached boat licenses, will be to make the fishermen free to contract with any cannery they wish, for their season's work and catch. That is to say, the Labor Market will be open and the services of the fishermen will have to be bidden for. In time no doubt this condition would work itself out in a satisfactory way, but at the beginning it would undoubtedly cause inconvenience, and uncertainty to all. It would probably come about that the large canneries would get the best fishermen and the small canneries the inferior

of inshore deep-sea fishing has been found to progress with the use of motor-boats. While canners think that this tendency is bound to be felt and in fact is being felt now to a greater or less extent in British Columbia, yet they believe that this year or next year, the third or the fourth year of the war, is no time to introduce this comparative innovation in a wholesale manner. It is believed that to make a complete change from the old sailing boat or row boat to the motor-boat would not be economical. It has been suggested that perhaps the spirit behind the regulation might be met by stipulating that not more than ten per cent. of the fishing licenses should be allowed to operate with motor-boats to begin with and an increase of ten per cent. be allowed each succeeding year. It is believed that the change to motor boats should not be sudden but rather gradual and thus give the older canneries which are equipped wholly with row and sail-boats, a chance to sell some of their boats to the newer can-



Interior of a B.C. Salmon Cannery.

fishermen, for the capacity of the fishermen differs very greatly. Then, again, the old order by which the canners advanced money, boats and nets would continue, but it is likely that the advancement would have to be larger than formerly in order to hold the fishermen to their agreement in the face of competition.

This regulation is an effort on the part of the Department to render assistance to the independent white fishermen for whom no one can do too much, and in this work and aim the canners are in sympathy with the Department. It will also put the larger canners on a par with the smaller ones so far as fishermen are concerned in the open market and the only advantage one will have over the other will be in the ability of one to outbid the other.

As to the regulation referring to the use of motor-boats on the northern streams, this is said to be, and it undoubtedly is, a fundamental tendency of the fishing industry throughout the world, where the development

of inshore deep-sea fishing has been found to progress with the use of motor-boats. While canners think that this tendency is bound to be felt and in fact is being felt now to a greater or less extent in British Columbia, yet they believe that this year or next year, the third or the fourth year of the war, is no time to introduce this comparative innovation in a wholesale manner. It is believed that to make a complete change from the old sailing boat or row boat to the motor-boat would not be economical. It has been suggested that perhaps the spirit behind the regulation might be met by stipulating that not more than ten per cent. of the fishing licenses should be allowed to operate with motor-boats to begin with and an increase of ten per cent. be allowed each succeeding year. It is believed that the change to motor boats should not be sudden but rather gradual and thus give the older canneries which are equipped wholly with row and sail-boats, a chance to sell some of their boats to the newer can-



THEN, again, the cost of equipping nearly a thousand fishermen with gasoline boats, all of which would have to be new and costing from two hundred and fifty dollars to five hundred dollars, a piece, would be very great and is not warranted by the conditions of the fishing trade at the moment. The Department says that there is no need for the canners to equip the fishermen with motor boats, but the history of the Fraser River tells the story that where one cannery provides any number of motor-boats for the fishermen it employs, then all the canneries must provide them, because the fishermen demand it, and in the salmon fishing industry, what the fishermen want, because they are the ones who bring the supply to the canneries, they generally get. So this regulation will result in the canneries of the

north having to expend several hundred thousand dollars in buying motor-boats to be used by their fishermen, an expenditure which will press very hard upon many of the canneries and is not in the nature of good business, because extensions to plant should invariably be made out of profits. The canners contemplate such expenditure with much disapproval and anxiety and the credit agencies are not enthusiastic over the prospect.

Perhaps the strongest argument that is urged against motor-boat fishing on the northern streams is that the fisherman can catch twice as many fish by using a motor-boat as he can by using a row boat and that therefore motor-boats will mean over-fishing, and over-fishing inevitably means depletion of the supply. This is a problem that the department is as vitally interested in perhaps as the canner, but there is no doubt from the canner's standpoint that if the supply is de-

pendent business men, and one representative from the canners, and one representative from the fishermen, might result in recommendations being made that would attain the objects the Department has in view and at the same time safeguard the industry in its operations as well as take precautions to prevent the depletion of the supply of salmon. The canners of British Columbia say that they are willing to abide by the decision of such a commission for they claim that when all the facts are adduced that their contention will be proven. They say that all they ask is a fair deal, which they claim they are not receiving at the hands of the department in the light of the proposed new regulations for the year 1918.

One of the regulations made by the advisory board at Ottawa in January was that salmon canners should sell Chum Salmon for bait to halibut fishermen when called on to do so at the same price that the Chum



Filed Salmon Cans in the Cooling Room of a B. C. Cannery.

pleted then the salmon canning industry of British Columbia is wholly destroyed.

It will be seen that there are differences of opinion regarding the wisdom of putting into force these regulations relating to the northern streams, and while one must be willing to admit that the Department is conscientious in all it does, yet it is open to question whether the department sees the situation as it appears and appeals to the cannery men who have to consider methods of operation and financial expenditure. The question with the canners is: Where is the money to come from with which to buy motor-boats to supply the fishermen? This is a question which does not concern the fishery department but is vital to the canner. In this regard, as well as in others, it seems reasonable to suggest that perhaps a thorough investigation into the whole state of the fishing industry in British Columbia by an independent commission of three in-

Salmon were worth to the canners. On April the 11th this regulation was changed by order from Ottawa whereby it is made optional on the part of the canners to sell Chum Salmon to Halibut fishermen for bait. This was one of the regulations that met with the disapproval of the British Columbia Salmon Canners, and while it was given out as part of the policy of the Department of Fisheries early in the year it seems now that the criticism offered it has caused the department to reconsider its decision and mitigate the offending regulation. This would seem to indicate that when that particular regulation was put into force that the Department had not all the necessary information in its possession relative to the effect of the regulation upon the salmon canning industry. Certainly it seems strange that the department would cause the canners to assist in the use of a good food fish for bait to catch other food fish when the canners

needed all the Chum Salmon they could get for canning purposes. It appeared at first glance to be a direct discrimination against the salmon canners and in favor of the halibut fishermen, a discrimination that in the interest of equality of treatment could not be maintained.



IN the light of this episode, it is reasonable to assume that perhaps when the Department has more closely considered the proposed regulations for 1918, and has received further information, particularly as to how they will effect the salmon canning industry, will see fit to change them or withhold them altogether. If the Department can be persuaded to change one regulation it may be possible to persuade it to change others, particularly when the regulations most grievously complained against, are such as threaten to revolutionize the whole salmon canning industry of British Columbia, in the opinion of the canners who are most vitally interested in a financial way, and who are not the least of those concerned about the conservation of the salmon supply, upon which their whole business depends.

The Fisheries as a Profession

By MARGARET McLAREN.

Poets have sung of the ocean wave until some persons doubtless think of the vast expanses of water as a vehicle by which thought is carried toward the artistic effect of silvery moonlight or ominous storm clouds upon the rolling deep.

But the ocean, since earliest times has provided the means of subsistence as well as adventure to the different races of men who fared forth upon its broad bosom in hopeful and sanguine search of either. I say sanguine, because none but he whose heart is brave with that good red blood which is indeed "The wine of life", would dare the risks assumed by them whose chosen calling is the sea-faring life.

"He goes to sea", was once, to the writer, a passport to all the romantic stories conjured by the traveller in foreign lands, or of tales of soul racking and hardily endured ship wrecks.

The annals of the fisheries of Canada and Newfoundland hold many such stories, but the fishermen, unwilling to pose as heroes will laugh derisively at the "Nosey" searcher after details and say, "Aw that's nothing", when you speak of some known danger endured.

Going as far back as history carries us, we see that four hundred years ago, the adventurous fishermen of the past, crossed from different parts of Europe to the wild and formidable coasts of Newfoundland, in such tiny vessels as were then in use.

There they dwelt and came and went without assistance from anybody and made the precarious living of the fishers of long ago. The locality of Canso is one of the most ancient fishing stations in Canada, and there is authentic proof that even as early as the eleventh century, Welsh fishermen came to these waters for the abundant catches to be obtained.

One historian states that the Indians possessed nets made of fibrous roots and the sinews of animals with which they fished in the sea, using the boat called by the historian a proa in which they went about all over the ocean, fearlessly.

Regarding the inducements offered to the colonists hundreds of years ago, a perusal of the archives shows that the fisheries were cited as one of the principal ways of earning a living in the new land.

For a long time the fishermen worked their way and to a great extent it is still the case, unaided. By their brave industry and perseverance they have accomplished what the early colonial mind would have doubtless seemed a fairy dream, because it is such a far cry from the primitive appliances of early days and the tiny vessels, to the gears, and machinery used in the modern handling of fish and the valuable tonnage owned in the industry. But the fishermen of the past and present, own the same stout hearts.

Now, let us see what the profession of a fisherman has to offer to the young manhood of Canada and Newfoundland. We will contrast the profession of law as an example. The boy who becomes a lawyer, is sometimes considered as on a better social plane than his brother who has gone into training as an "Aquaticist", as a very affected clown in a circus once called a fisherman.

To obtain the privilege to spend his life in a stuffy office and depend on law breakers, whether corporations or criminals, for his "Salary", he has to qualify by long and expensive years at college, and unless luck and Providence are both on his side he will never have much coin. He can't even get either "elbow room or the great whiffs or God's own air" that are free to the fisherman.

Outside of a pecuniary consideration, when it rains a few drops he dodges home through the smoky streets jostled by all and sundry, and usually has a little cough, because of his sedentary life, to which his parents because of the wish to make him superior (save the mark) have condemned him.

See the other lad. He can face the danger with a song in his heart and his lusty voice roars out untrammelled by the confines of City walls. The associations of his daily life make him self reliant and dependable, and living among his comrades makes him human, and therefore nearer the image of the Creator than those whose social code is like an iron band, And —altho' some would not think so he has more to spend than a great many of professional men, and is consequently of greater value in a commercial sense to his country. Therefore the fisherman should look upon his occupation as a trade or profession of which he may be proud. Many Cityites know nothing whatever about the fishermen or their work. Recently, after the usual performance in a Halifax theatre, a "Fishery Film", showing scenes at the "Banks" was put on. Great interest was manifested by those present, and some young men remarked that "That was the life". So it is. It is a great pity that more is not done to place before the youth of Canada that there is room for them in its fisheries, and no over crowding as in other professions.

Statistics show that since the year 1857 the fisheries of Canada and Newfoundland have increased wonderfully. The greatest increase is noticeable during the last five years.

In conclusion the writer would say that the Canadian Fisheries have been developed to their present magnitude by Canadian effort, the slogan should be "Canadian fisheries for Canadians," and rigid care should prevent the infringement of our rights in that regard.

A Naval Reserve of Canadian Fishermen

By FREDERICK WILLIAM WALLACE.



THE present war has shown the value of trained fishermen in the naval operations of the British Fleet. Trained and untrained, since the outbreak of the war in Aug., 1914, the fishermen of Great Britain have played an enormous part in keeping the Hun at bay and foiling his schemes on the sea and under the sea. Almost automatically, these men and their vessels slipped into their places as part of the great auxiliary fleet assisting the main fighting flotilla in maintaining the glory of the Empire's flag and guarding the ships that sail under it.

Rudyard Kipling, Alfred Noyes and other noted writers and poets have been permitted to see and hear a little of what the fishermen have accomplished in the War, and what they are doing. Both have sounded their praises in song and story, and both have ventured the opinion that without her fishermen and fishing fleet, Britain would have been in hard straits today.

In their steam trawlers they are steering through the German-mine fields with wire hawsers between them sweeping the deadly undersea bombs to the surface and exploding them; they are keeping ceaseless patrol in the waters of the North Sea, the English Channel, Eastern Atlantic and Mediterranean, with guns mounted ready for the unwary submarine of the enemy; with nets and other devices they are hunting the U-boats and putting many out of business, and as tenders, convoys, and guard-boats, they are doing their bit in a manner beyond praise.

When the call came for men for the Navy, the British fishermen rolled up in thousands. The battle-cruisers, the dreadnaughts, scouts and torpedo-boat-destroyers claimed many; the transports, hospital ships and auxiliary cruisers took others, but where they did their best work was in their own ships—the steam trawlers, herring drifters and fish carriers. When their ships were tricked out in Navy grey with the white ensign flying from the mizzen on jack-staff, Fishermen Jack shed his blue "gensy", his "fearnaught" pants, and his "dopper" for the regulation rig of the man-o-war's man. Under their own skippers, now uniformed and rated as skippers "Royal Naval Reserve Trawler Section", they took hold of the work to be done, and "carried on" like the bully brave hearts that they were.

There were skippers who never wore a white starched collar in their lives before, and to whom anything in the shape of a uniform was a badge of servility, who, in tight places and not to be out-done by the regular Navy men, accomplished deeds which were almost startling in cold blooded coolness and brazen nerve. Where the skippers went, the fishermen crews went also, and it is recorded that they did things that caused the Navy men to characterize them as a "crowd o' bloody terrors".

Of course they are the right stuff and the best sailormen in the world. You can't beat fishermen for handling small craft in any kind of weather. It's part of their profession, and if they never got credit for their seamanship before, they're getting it now.

Here in Canada, we have in our fisheries, as fine a breed of sailormen that one could find anywhere. The Atlantic men are the more numerous and are the genuine off-shore type. There are probably fifty thousand fishermen in Canada on the salt water, and ten thousand on the Inland Lakes, and of this sixty thousand seafaring men, scarcely a thousand have been enlisted in the Navy and none of them ever received a Naval training.

As long ago as 1911, the writer came out strongly in Toronto "Saturday Night" and other papers, advocating that a Naval Reserve of our fishermen be organized in Canada. The Canadian Naval Bill was before the public then and various orators were backing it up and telling the people that our fishermen would be falling all over themselves to enlist in a Canadian Navy. The writer pointed out, at that time, that the fishermen of Canada would not enlist for permanent naval service. Life on a man-o-war did not appeal to their independent notions and existence, and the pay was not high enough to induce them to leave their free and remunerative vocations. Recruiting for the "Rainbow" and the "Niobe" was started and was a dismal failure, and a complete blank as far as the fishermen were concerned.

It was then that the writer suggested the better alternative of a Naval Reserve. A training period of four to six weeks per annum was proposed and at the seasons when fishing was slack at various centers. We suggested that a few of Great Britain's obsolete cruisers, gun-boats or torpedo-boat destroyers be procured by the Canadian Government and anchored in centrally located ports. One could be stationed at St. John, N. B., another at Halifax, N.S., others at Quebec, Kingston, Toronto or Port Arthur (for the lake fishermen), Vancouver or Esquimalt, and Prince Rupert. These vessels need never leave their moorings. They are for training purposes only and in them the fisherman reservist could be trained in gunnery, signalling, naval drill, navigation, etc.

As the fisherman, by virtue of his calling, is an expert seaman, it is not essential that he be sent to sea on a man-o-war for training. The technicalities of naval work can be imparted to him on a moored school-ship. He doesn't have to be taught seamanship or how to handle a boat steering, sailing, etc., though, of course, his knowledge of these subjects can be improved.

In the training of the fisherman reservist, the course followed should be along the lines for which he is most adapted, and that is as a small boat sailor. The present war has shown the value of the small craft in naval affairs, and it is in patrol work, mine-sweeping, mine-laying, and submarine catching that the fisherman is most valuable. It would be a mistake to train him for work on a battle-ship. In that, his peculiar individuality and abilities would be lost.

In order to stimulate interest in the movement, a retaining allowance should be granted all fishermen joining the Reserve and putting in the drills and he

should be paid for the time he is drilling. Officers should be selected from among the many bright young skippers to be found in the fishing fleets and let them be given the intermediate Reserve ratings of Skipper and Mate with opportunities to qualify for commissions. The appointment of yachtsmen and landsmen to officer's ratings over fishermen will not be relished and will make the service unpopular. The fisherman has a great contempt for "yachters" and "dude officers" and would much prefer to obey the orders of men who have experienced the ways of the sea much as he himself has experienced it.



NEWFOUNDLAND has beaten Canada out in the Naval Reserve scheme. A Naval Reserve of her fishermen has been in existence there for many years and the gun-boat "Calypso" was used for training them. Since war broke out, the Island Colony has contributed over two thousand men

both of them will give much thought and consideration to the problem.

Shortly before the war, Canada passed an Order-in-Council whereby the Royal Naval Canadian Volunteer Reserve was formed with authority to raise 12 Companies of 100 men in each. One company was raised in Vancouver and helped to man the "Rainbow" when the war broke out, but the others did not materialize. Since then, the R.N.C.V.R. constitutes the Canadian Naval Services and some overseas drafts for the Imperial Navy, but the enlistments for it were not drawn from the fisherman class.

In our scheme for a Naval Reserve of our fishermen, we are looking to the future. Plans should be prepared now for execution immediately after the war. At the present time our fishermen are necessary for the production of food and it would be a mistake to divert them into naval work. There may come a time when



A Record "Deck" of Pacific Halibut. Some of the Trip of 320,000 lbs. Landed by the SS. "Flamingo" in August, 1912.

to the British naval forces. Canada, with three or four times the number of eligible fishermen, has contributed practically none, though many of our fishermen joined the military branches.

At the recent Imperial War Conference in London, one of the resolutions passed reads: "It is recommended that the Admiralty be requested to work out, immediately after the war, the most effective scheme of Imperial naval defence, for consideration of the Governments concerned at a conference to be held with representatives of the Admiralty regarding the future security of the Empire."

Sir Robert Borden and the Hon. J. D. Hazen, Minister of Marine and Fisheries of Canada were present at this conference and we have no doubt but what

the naval end will be of paramount importance, and it would then be a splendid thing, if occasion arose, for Canada to be able, in an instant, to have a trained naval force of many thousand men; for the best and most suitable of our fishing boats and tugs to be instantly turned over into war-craft, and our harbors defended and coast patrolled. The proper personnel; the trained seamen we always have with us, are the fishermen. As the journal of the fisherman and the fishing industry of Canada, let us voice the hope that the Hon. Mr. Hazen, in his administration, will inaugurate a Naval Reserve. By doing so we will be acting up to the doctrine of Preparedness, which after all, is the surest guarantee of peace.

Office of the Superintendent of Fisheries Ottawa

Mr. Editor:—

Let me wish you the largest possible measure of success in the campaign upon which you are entering with the support of the Canadian Fisheries Association. It will, I am confident, give eminent satisfaction to everyone who has the welfare of the fisheries at heart.

For reasons that are so obvious as not to need citation, Canada as a whole, has in the past had no adequate realization of what an asset she has in her fisheries. This condition necessarily reflected itself in the conduct of the industry, and there has, consequently, been in years gone by, especially on the Atlantic coast, a serious lack of progression in the fisheries and of that pride in the industry that those engaging in it have such good reason to entertain.

While there has been rapid development of the demand for fish in Canada during the past few years, there never was such an opportune time as the present to make the use of fish general. It would be a national pity if this opportunity were lost. Butcher's meat is now so expensive as to be beyond the reach of many, at least for daily use. Moreover, we should not forget that the less that is consumed here, the more there will be to send across to the soldiers. At such a time as this, it is of immeasurable national importance to be able to turn to our seas and inland waters, and there find excellent food in such abundant quantities as to much more than meet all requirements.

One sometimes hears it said, that fish is not very sustaining, and therefore may not be relied upon with safety to the health to replace meat to any great extent. This is far from the fact. Pound for pound it is as nourishing as butcher's meat. Analysis has demonstrated this beyond room for question. Therefore, there need be no hesitation in increasing the personal consumption of fish as much as desired. In Great Britain, in normal times the consumption of fish averages over fifty-eight pounds per head per annum, including children and infants. This is about twice as much per capita as in Canada, and the consumption of fish was increasing in Great Britain year by year.

The experiment of supplying fish to our soldiers overseas worked so well that it is being continued in increasing proportions, not because it is cheaper, but because they desire it. This has created a considerably increased demand, and added to this, come large orders from Great Britain to meet the civilian demands there owing to the shortage of the landings by British fishermen on account of the war. These conditions have combined to change the problem in Canada from one of finding remunerative markets for our fish, to one of producing sufficient quantities to meet demands.

This problem is vexed by the fact that enlistments from the ranks of the fishermen have seriously reduced their number, and owing to the inducements in the merchant service, some fishing vessels have been converted into traders. According to the fishing bounty claims, there were approximately three thousand and fewer fishermen on the Atlantic coast in 1916 than in 1915.

How in the face of these conditions, is production going to be increased and increased sufficiently? There seems only one way, but it is a perfectly feasible one, viz.—by increased individual effort. It is not suggested that the fishermen are not industrious, or are not now working hard, but this is a time when each of us, whatever our calling may be, must be prepared to exert the last possible effort to do what may lie in our power to further the principles for which we are fighting, and to help to bring the war to a successful finish, even if we cannot ourselves join the fighting ranks.

An individual fisherman may ask himself, what the use of additional effort by him would be, as the little he could do by an extra couple of hours a day would not count for much. But let him remember that, on the Atlantic coast alone he is but one of about fifty thousand, and if each worked two hours per day more it would be equivalent to a daily increase in fishing of about 100,000 hours. Let this be continued for the summer months, and the problem that is before us will be solved.

There is another point to which I should like to call attention, viz., the desirability of the more general use throughout the country

of canned fish. While, even with existing transportation facilities, there may be times when it is difficult to procure fresh or fresh frozen fish, perfectly fresh fish in cans, with all their juices retained, is always available. It should not be forgotten that the fish are delivered at the canneries fresh and firm from the water, and are placed in the cans within a few hours after being caught. They are thoroughly cooked and sterilized, so that they are always in convenient condition for use. They can be served in so many attractive and appetizing ways that it is surprising that their use is not much more general, particularly in a country like ours, where the distances are so great and the weather conditions at times so extreme.

I understand that your first number will deal specifically with the British Columbia fisheries. The salmon and halibut fisheries of that province have so overshadowed others that few people, excepting those directly interested, know little or anything about the others. Hence, there has been practically no demand for them. I trust that you will succeed in bringing to the attention, particularly of our western provinces, which should be receiving liberal

supplies of these fish, the fact that in catching halibut other excellent varieties are captured, such as black cod,—which when kippered is not surpassed, in the judgment of many, including the writer, by even finnan haddie,—grey cod, and different kinds of flounders, etc., all of which can be had in abundance and at moderate prices.

In concluding, let me draw attention to what it means to a maritime country in the day of trial, to have available a large body of skilled fishermen. When the history of this war is fully written, it will be realized much more generally than it is now, or ever has been, what it has meant to Great Britain to have a large, fearless fishing population. The paths of the sea would not have been as safe even as they have been had it not been for the ready way in which the fishermen devoted themselves, and the owners their well equipped vessels, to that most perilous work of ridding the ocean of the seeds of "frightfulness" sown by Germany.

Yours truly,

WM. A. FOUND

SUPERINTENDENT OF FISHERIES.

April 30th, 1917.

Prince Rupert Branch Canadian Fisheries Association



A BRANCH of the Canadian Fisheries Association has been formed in Prince Rupert which has become the leading fishing centre on the Pacific coast. It is a marvel that such a branch had not been organized before in view of the importance of the fishing industry to this port. The branch owes its origin to the visit of Mr. J. J. Harpell, representing the Canadian Fisheries Association, to the city. A few scattered members of the Association resided here, but with the visit of Mr. Harpell, who is enthusiastic over the work that the Association can do it was decided that a branch should be duly opened.

At a meeting in the city hall on the evening of April 13th there gathered on short notice quite a representative body to hear the objects and aims of the organization explained by Mr. Harpell. Ald. Montgomery, the chairman of the City Council Fisheries Committee, presided and introduced the visitor. There were also present T. H. Johnson, General Manager of the Canadian Fish and Cold Storage Company, here; Ald. O. H. Nelson, who is a member of the Dominion Fisheries Advisory Committee for the Pacific coast; Ald. Dybhavn an active fish buyer in the city; Judge Carss; J. F. Mathieson of the Canadian Fish and Cold Storage staff; C. E. Bainter and C. H. Thomas, both of them interested in the operation of halibut boats

operating out of here; and William Shrubsall, a fish curer and packer.

Mr. Johnson explained the good work that was being done by the organization and advocated the formation in this city of such a body that might from time to time be of great benefit to the industry in many ways. He was followed by Mr. Harpell, who went more fully into the importance of the organization in Prince Rupert of a branch. The Association was doing much to foster the industry throughout Canada. Its good offices were always available in urging anything before representative bodies looking to the advancement of the fishing industry. It also aimed at advancing the business by the encouraging by publicity and every other means of the use of fish in Canada. It was aiding in the encouragement of everything looking to the spread of technical knowledge relative to the subject.

There was a very fine discussion of the subject following the address when all present took part and favored organizing. Accordingly the Prince Rupert branch came into existence with the following officers for the ensuing year:

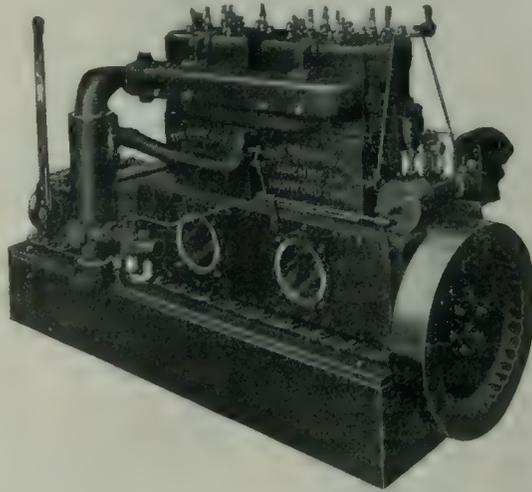
Chairman, Mr. T. H. Johnson; Vice-Chairman, Ald. John Dybhavn; Secretary-Treasurer, Ald. O. H. Nelson; Committee, J. F. Mathieson, C. E. Bainter, Judge A. Carss and C. H. Thomas.

The Gray-Prior Four--Cycle Model D-4

New Four-Cylinder Machine Which Is Notable for Its Unusual Length of Stroke A 36 H. P. Outfit Which Combines Medium Weight with Unusual Strength

The Gray & Prior Machine Co., of Hartford, Conn., for many years manufacturer of the well-known Hartford two-cycle motor, has now entered the four-cycle field with the four-cylinder motor shown in the accompanying illustration. This motor, which develops 36 h.p., is chiefly remarkable for the length of its stroke, this being 8 inches to a cylinder bore of $4\frac{1}{2}$ inches, but there are many other features which give it distinction. The D-4, as it is called, is a moderate speed engine built for heavy and continuous service and suitable for fishing craft. In stating that it is particularly adapted to this service, the manufacturing company calls attention to its consistent and economical operation, the enormous strength and high factor of safety of all its parts, and the liberal use of heavily case-hardened and heat-treated alloyed steel parts.

In general design the motor combines reasonable lightness with great strength, unusually large bearing surfaces and few parts. Accessibility has been the foremost consideration in its design, and every moving part may be readily removed for inspection or adjustment without taking the whole motor to pieces. The crankcase, for instance, is constructed in two separate castings, the upper half having large plates on each side to make it easy to reach the various parts without removing the cylinder from the base. The center line of the crankshaft is arranged above



the top of the base, thus making the main and the crankpin bearings easily accessible for adjustment. The flywheel is held in place with six steel studs that extend through its hub into a disc which is an integral part of the crankshaft. This method of fastening is declared to render the flywheel readily removable while proof against its working loose in service. The cylinders are of the L type and are cast in pairs with detachable heads. This method of construction not only presents a neat appearance, but simplifies the removal of the pistons and connecting

rods for cleaning or adjustment.

The valves are placed on the port side and all valve chambers and passages are thoroughly water-jacketed and enclosed. The valves of $2\frac{1}{4}$ -inch diameter and are constructed with cast iron heads electrically welded to steel stems. Adjustments for clearance are easily effected by means of screw and lock nut in the push rod.

Other interesting features include machined steel case-hardened gears, force-feed lubrication, two independent ignition systems, double pump equipment, air compressor, governor, water-jacketed manifold, etc.

The camshaft and cams are made from high-grade steel. The cams are a driving fit on the shaft and are held in place by means of Woodruff keys and taper pins. The shaft, cams, and bearings are housed in a tubular-shaped casting and are flooded in a bath of oil.

A New Form of Milk for the Fishermen's Cook



RECENTLY milk in powder form has come into use quite largely for the requirements of fishermen and fishing vessels, and has proven to be in many ways a welcome addition to the fisherman's supplies. It is probable that as this product becomes better known it will be used by almost every cook on fishing vessels and fishing-boats throughout the country.

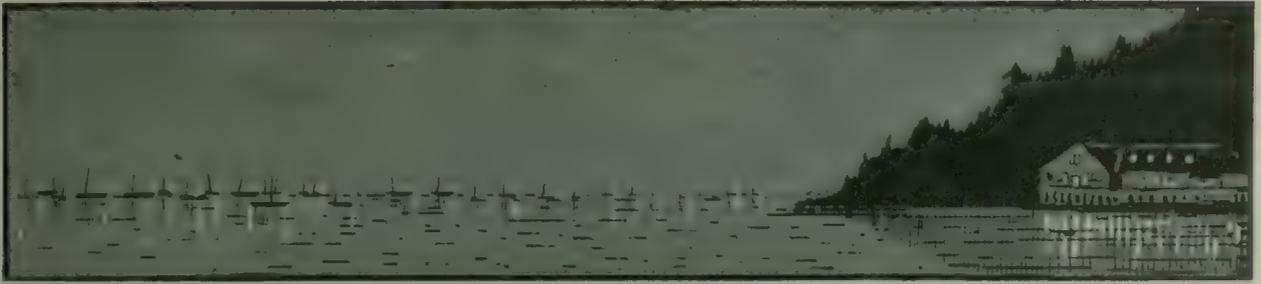
The product most largely used is a separated milk powder, made by a process recently perfected, which makes perfectly soluble powder for tea, coffee, etc. It is usually mixed with water, and is used as ordinary liquid milk. Manufacturers, however, do not recommend it so much for this purpose as for use in every kind of cooking where milk is ordinarily used. For cooking the milk powder is mixed in dry with the other ingredients. Where the recipe calls for milk,

water is used in its place, the milk having been already supplied by the water which has been used.

Intense cold does not in any way injure the powdered milk, as the amount of moisture in it is so small that freezing has no effect upon it at all. Likewise, it is impervious to heat of any kind. Another great advantage of this product is that it will keep for a long time after the can has been opened. This product is no longer an experiment, but a proven success, and is warranted to contain no adulteration, preservative or chemical of any kind. It contains nothing except the solids of milk, from which the water has been removed.

It will pay any fishing vessel outfitter and cook to investigate this product, as by it all the difficulties of supplying milk can be overcome, as it is most satisfactory and can be furnished at a low cost to the men in a very convenient form.

Samples and information regarding this product can be secured from the Canadian Milk Products, Limited, 10 William Street, Toronto, manufacturers of "Klim,"



Canada's Pacific Fisheries



BRITISH Columbia leads all the other provinces of Canada in the value of the fish caught by her fishermen. She has done this for years, as in the valuable salmon and halibut fishery the province is pre-eminent. The returns for the fiscal year ending March 31st, 1917, show that the value of British Columbia's fisheries amounted to \$14,538,320, of Canada's total fishery landings of \$35,860,708. Two-fifths of Canada's fishery catch comes from British Columbia.

The figures do not constitute a record, as in 1913, the catch totalled \$14,455,480, but it is a substantial advance over last year by \$3,023,234. The rise in value comes, not from the quantity of fish landed, but from the higher prices paid for the fish. The landings of halibut fell off considerably by 19,000 cwts. The landings of salmon remained about the same as in the previous year, but with a considerable rise in value. Of course, with regard to the latter, both years were "off years" in the four year salmon cycle, and the big salmon run is due this summer.

less abundance. Her greatest asset, however, is her proximity to the great fishing grounds of the North Pacific—that vast area open to her fishermen which extends outside of the three mile territorial limit from latitude fifty-five degrees north to the icy limits of the Bering Sea.

Within this area, open only to our fishermen outside the three mile limit, and barred to us as the inshore salmon fishery is concerned, we have the great halibut banks of the Gulf of Alaska, with quantities of black and grey cod, red cod, skate, soles, flounders, and dogfish to be caught on the hooks and in the trawl, and in the Bering Sea are the grounds of the grey cod. An idea of the extent of these fishing grounds will be had by referring to the chart illustrating this article.

Sometimes included in fishery resources are the seal, walrus, and whale fisheries, and the kelp and sea-weed harvests. In all of these, British Columbia is richly endowed.



Sockeye Salmon.

Fishery Resources.



THE waters of, and adjacent to British Columbia and Yukon Territory, are extremely prolific in fishery resources. Edible fish are to be captured in abundance, but up to the present, the fishermen of the Pacific provinces have confined themselves to the capture of practically three species—salmon, halibut and herring. Other kinds which abound in Pacific waters include grey cod, black cod, oolachans, shad, flounders, smelts, trout, sturgeon, tom-cod, soles, skate, octopus, shrimps, whiting, perch, red cod, dog-fish, rat-fish, oysters, crabs, clams, and other shell fish.

In almost four hundred miles of coast-line north and south, or seven thousand miles of sea washed shores, British Columbia is richer in fishery wealth than any other province. Within that area, nearly all of the species enumerated above are to be found in more or

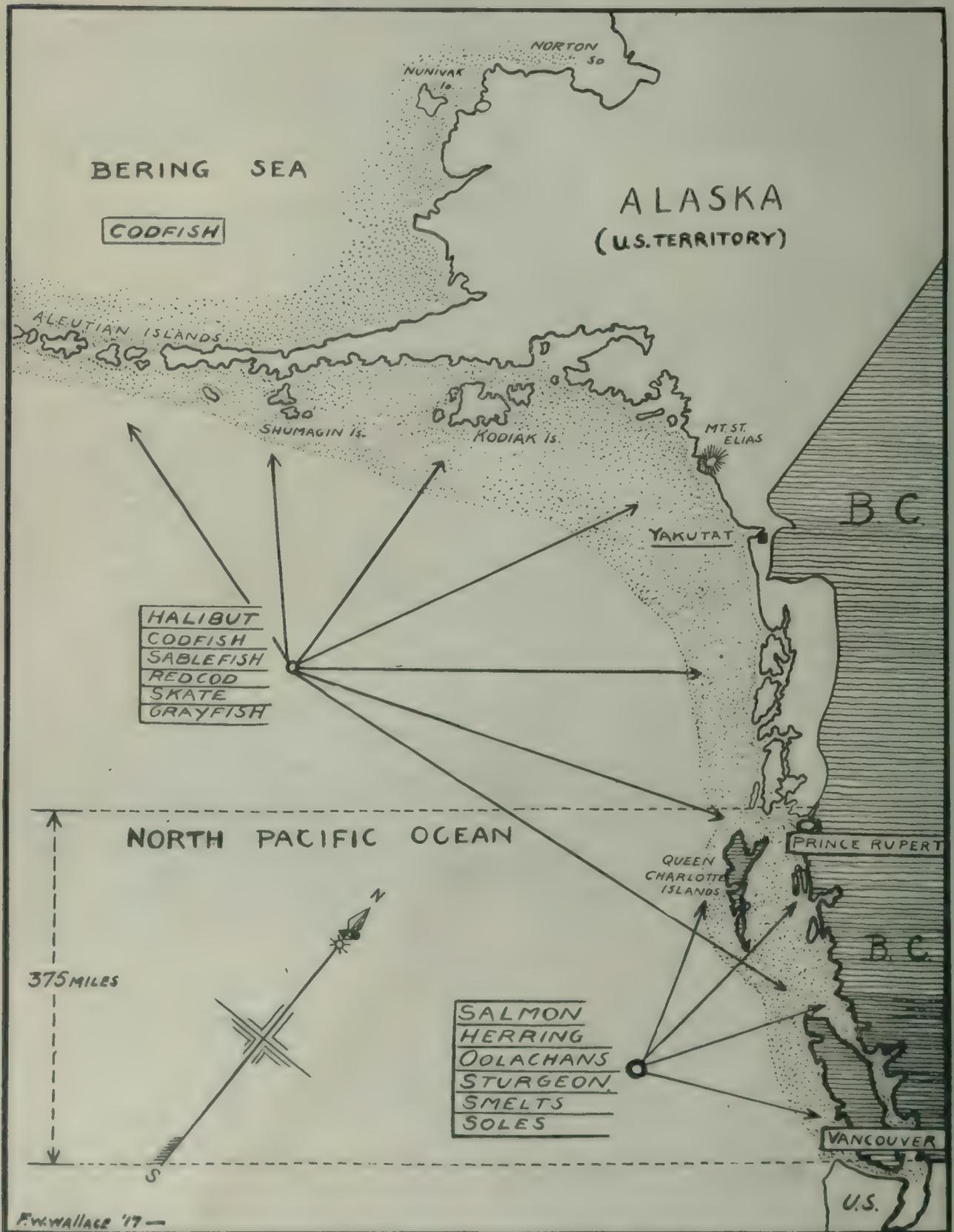
The Salmon Fishery.



THE salmon fishery is British Columbia's greatest asset, and it has made the Province famous throughout the world. On the Fraser River, Skeena River, Rivers Inlet, Naas River, and on the numerous inlets and channels of the broken and indented coast line, which are the habitat of the various salmon species in their seasons, are to be found the salmon canneries—some ninety in all, and representing a permanent investment of over three million dollars in property, buildings and machinery.

Practically a third of the British Columbia salmon canneries are located upon the Fraser River—famous for the enormous runs of sock-eye salmon—and with street car distance from Vancouver. The others are scattered to the northward up the four hundred miles of coast and many of them are located in picturesque fiords and amid the surroundings of silent waters,

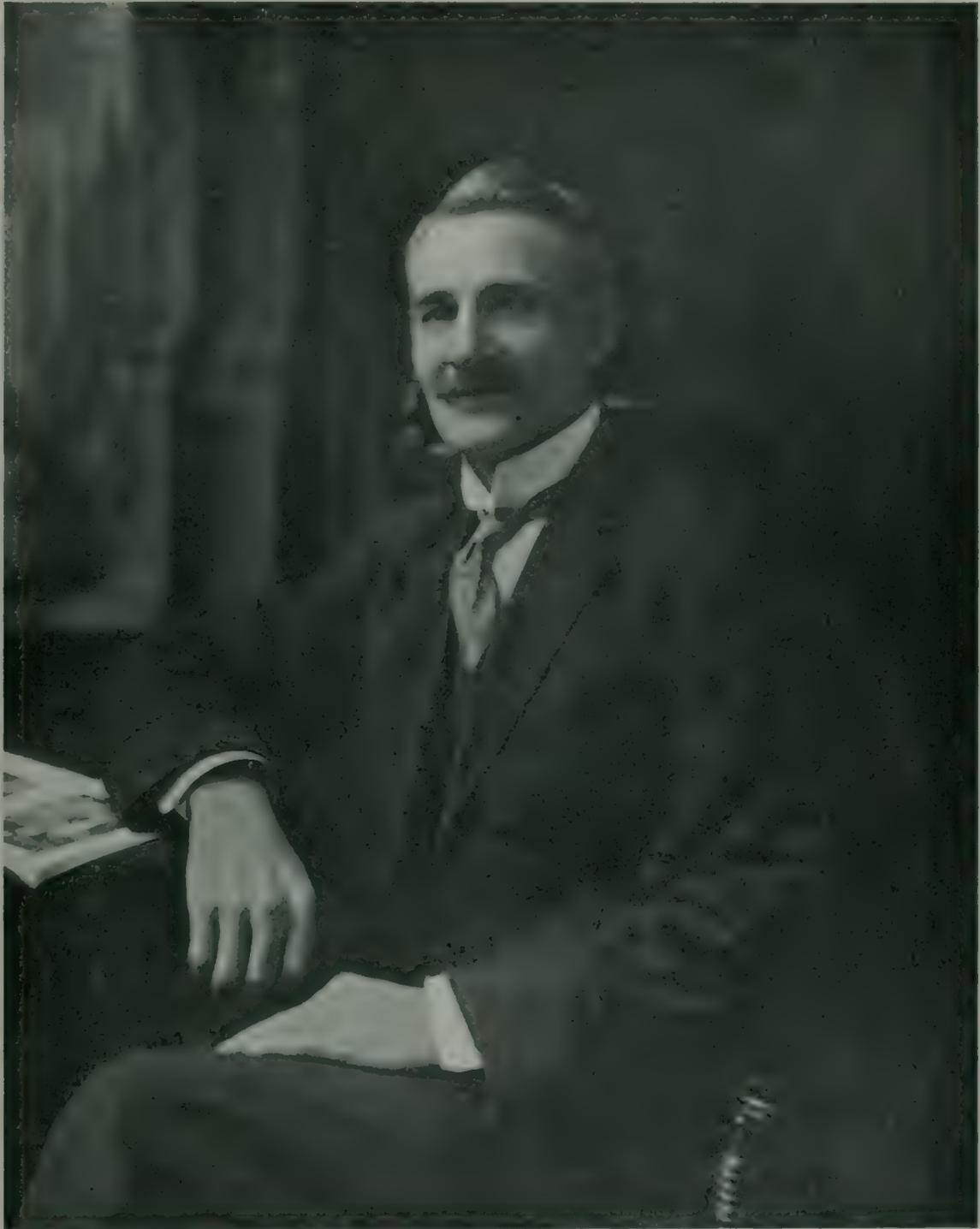
CHART OF THE FISHING GROUNDS OF THE NORTH PACIFIC



The shaded areas represent the fishing grounds open to British Columbia fishermen, with the species which are to be found on them.



HON. J. D. HAZEN, K.C., L.L.D., M.P.
Minister of Naval Service and Fisheries and Hon. President of The Canadian
Fisheries Association



SAMUEL Y. WILSON, Esq. Halifax, N.S.
Elected President Canadian Fisheries Association, January, 1917

primeval forests and towering, snow-clad peaks.

The Pacific salmon, its various species and the method of canning them, is ably described in the foregoing by Mr. John P. Babcock, Commissioner of Fisheries for British Columbia.

"We have in our waters the five known species of the genus *oncorhynchus*, termed the Pacific salmon. They are distinct from the salmon of the Atlantic, which are the genus *salmo*. Indeed, the word salmon does not by right belong to any fish found in the Pacific, it having first been applied to a genus found in Europe. The settlement of the Atlantic Coast of America was made by a people familiar with the European form, who at once recognized this fish as running in the rivers of their newly-acquired territory. They naturally and by right gave it the name salmon, for it is identical with the European form. With the advent of people from the Atlantic States to the Pacific Coast, they found running in all the main rivers a fish similar in form and colour, and of apparently similar habits, and they naturally called them salmon. Structurally these fish are but slightly different, but their life history is totally dissimilar, and they are distinctly and positively placed. The greatest difference is presented in the fact that all the species found in Pacific waters die shortly after spawning once. This is true of both sexes. This remarkable characteristic, when first brought to the attention of some Atlantic and European authorities, was discredited, as they did not then generally know that the Pacific salmon was different from and not identical with the *salmo salar*, which does not die after spawning, and generally returns to salt water after depositing its ova. While our Pacific fish are not salmon in a scientific sense, they are now the salmon of the world, because of their abundance and their fine canning qualities, which permit them to be offered in the markets of the civilized world.

"Taken in the order of their commercial importance in the Province, they are known as:—(1) The Sockeye or Blueback (*Oncorhynchus nerka*); (2) the Spring or Quinnet (*O. tshawytscha*); (3) the Coho or Silver (*O. kisutch*); (4) the Dog (*O. keta*); (5) the Humpback or chum (*O. gorbuscha*).

The Sockeye.

"(1.) The Sockeye weighs from 3 to 10 pounds, though specimens of 17 pounds in weight are recorded. The anal fin is long, and has about 14 developed rays. There are 14 branchiostegals. The gillrakers are more numerous than in any other salmon, 32 to 40. The young fry of this species can always be distinguished by the great number of the gill-rakers. The scales of the adult usually average 130 to 140 in the lateral line. The tail is narrow and widely forked. The adults in salt water are free from spots; the backs are a clear blue, and below the lateral line they are immaculate. They are in form and colour considered the most beautiful of their family.

"The bluish backs and silvery sides, which so distinguish them in salt water, give place in the headwaters, at spawning time, to a deep carmine, while the head and tails become a deep olive green, the male and female being equally highly coloured in the specimens found in the extreme headwaters of the Province. The head of the male undergoes less distortion in our waters than any of this genus. Specimens which enter the rivers towards the last of the season's run, and which do not ascend to the headwaters of the main streams, but which spawn in the lower reaches near-

er the sea, do not become nearly so highly coloured at the spawning period, many of the females not showing much, if any, red. The flesh of the sockeye is of a deep and unfading red. They enter the Fraser River as early as April. They are not taken until July 1st. The main run in the Fraser is looked for toward the latter part of July. The run is at its height during the first ten days of August.

"The sockeye run in all our Mainland rivers, and in some of the rivers of the west coast of Vancouver Island, and in the Nimkish River, near the head of the east coast of that Island. In the rivers of the north-west Mainland coast they run a month earlier than in the Fraser.

"The abundance of sockeye in the Fraser varies greatly with given years; there are years known as 'the big years' and as 'the poor years.' Their movement appears to be greatest every fourth year, and the run is the poorest in the year immediately following. The causes which may have led up to this most remarkable feature have given rise to much speculation, and many theories have been advanced to account for them, but none are sufficiently satisfactory to be generally accepted. This periodicity in the run of sockeye, which is so pronounced in the Fraser, has no marked counterpart in any other river in the Province or on the Coast.

"The spawning period of the sockeye extends from August, in the headwaters, to as late as October and November in the waters nearest the sea. They usually spawn in lake-fed or in lake-feeding streams, the first of their run seeking the extreme headwaters. Very little is known of the life of the young or the length of time they live in fresh waters before seeking salt water. Nothing is known of their feeding grounds in salt water, as they are never found in the bays and inlets, which distinguish our coast, and where the spring and coho are so common. It is thought that their feeding ground must be in the open sea. There is a smaller specimen of the sockeye found in many of our interior waters that appears to be a permanently small form, which is known to writers as 'The Little Red Fish,' 'Kennerly's Salmon,' or 'The Evermann form of the Sockeye,' and which in some lakes of the Province can be shown not to be anadromous. This form of the sockeye is often mistaken by observers as a trout. It has no commercial value, and does not 'take a fly' or any other device commonly used by anglers for taking trout. The Indians of Seton and Anderson Lakes cure great numbers of these small salmon by smoking them. They give them the name of 'Oneesh.'

The Spring Salmon.

"(2.) The Spring or Quinnet Salmon (*O. tshawytscha*) ranks second in importance in the waters of the Province. This species is known in Alaska as the King or Tyee salmon; in British Columbia as the Chinook, the King or Quinnet; in California as the Sacramento or Quinnet salmon. It was the first and for many years the only salmon used for canning. The spring salmon attains, in our waters, an average weight of from 18 to 30 pounds. Specimens weighing from 60 to 100 pounds have been reported. It has 16 rays in the anal fin, from 15 to 19 branchiostegals, and 23 gill-rakers. The number of scales in the lateral line run from 135 to 155. The tail is forked, and, like the back and dorsal fin, is commonly covered with round black spots. The head is rather pointed and of a metallic lustre. The back is of a dark green or bluish colour; below the lateral line it is silvery. At spawning it be-

comes almost black, with little or no red. On the spawning grounds of the Province they are often spoken of as 'black salmon.' In this respect these fish in our waters are different to those in the waters to the south, where the spawning fish are of a dull red. The spring salmon are the most powerful swimmers which seek our rivers, usually going to the extreme head of the watershed, which they enter. They seem to prefer the most rapid moving streams, and apparently avoid the lake-fed tributaries. The colour of their flesh in our waters is from deep red to a very light pink, at times almost white. Owing to the uncertainty of its colour, it is less generally used for canning, and all specimens are examined by the cannery before accepting them from fishermen. It is stated that the 'early run' fish are the most reliable in colour. It has also been stated that these pale pink

ing larger than any other of the genera. In colour these fish are very silvery, greenish above, with a few black spots on the head and fins. These fish run in August and September in the rivers on the north-west coast, and in September and October in the Fraser. Like the sockeye, they travel in compact schools. They do not seek the extreme headwaters, and frequent both the streams and lakes to spawn.

Dog Salmon.

"(4.) The Dog Salmon (*O. keta*) run in most of the rivers and Coast streams late in the fall. They average from 10 to 12 pounds in weight; much larger specimens are not unusual in most of our waters. They have 14 anal rays, 14 branchiostegals, 24 gill-rakers and about 150 scales in lateral line. In Provincial waters they spawn close to the sea, ascending almost every one of even the minor Coast streams.



Salmon on the floor of Cannery.

or white-meated salmon are not any less rich in flavour or oil than the red-meated ones but as the English market demands a red-meated salmon, and refuses to accept anything else, they are rejected by the packers.

"The spring fish enters the Fraser early in the spring, and the run continues more or less intermittent until July. There is no pronounced run in the fall.

"In recent years considerable quantities of spring salmon have been mild cured for the German market. In 1908 this trade amounted to 795,000 pounds, valued at \$79,500.

The Coho.

"(3.) The Coho (*O. kisutch*), or Silver or Fall Salmon, is found in all of the waters of the Province, and of late years has become a considerable factor in the canned product. This species on an average weighs from 3 to 8 pounds. Heavier specimens are not uncommon. It has 13 or 14 developed rays in the anal fin, 13 branchiostegals, 23 gill-rakers, and there are about 127 scales in the lateral line, the scales be-

In the sea they are dark silvery in colour, the fins being black. At the spawning period they become dusky, with lateral lines of black, with more or less grey and red colouring along the sides. The heads of the males undergo the most marked distortion, and the teeth in front become large and dog-like, hence the popular name. Until within the last four years, these fish have not been considered of any value. Now they are captured in great numbers by the Japanese, who dry-salt them for export to the Orient, many thousands of tons being exported annually. They are never canned in the Province.

The Humpback.

"(5.) The Humpback Salmon (*O. gorbuscha*) is the smallest of the species found in our waters, averaging from 3 to 6 pounds. It has 15 rays in the anal fin, 28 gill-rakers, and 12 branchiostegals. The scales are 180 to 240 in the lateral line. In colour it is bluish much smaller than in any other salmon, there being 180 to 240 in the lateral line. In colour it is bluish

above and silvery below. The back and tail are covered with oblong black spots. In the fall the males of this species are so greatly distorted as to give them their popular name. These fish run in abundance only every other year, coming in with the last of the sock-eye run. They are but little valued, though a considerable use has sprung up during the last few years. With the development of the markets for cheap fishery products, a demand has come for all of our salmon

of the hatchery and the methods of incubation and disposal of the fry; the degree of protection necessary, and the proper limits of a close season are not to be determined wholly by experience elsewhere, but by local observation and systematic investigation extending over a series of years. This the Provincial Government, by the establishment of a Fisheries Department, and the appointment of a Fisheries Commission, has undertaken to determine, and with every



Coho Salmon.

products, with the result that the fishing season is being extended to cover the runs of all five of the salmon species found in our waters. This lengthening of the season is of marked benefit to our regular fishermen, and with the development of our other fisheries, it is confidently believed that these hardy men may find ready employment during the entire year."

Local Conditions.

Concerning the habits of the salmon in British Columbia waters, there is a wide field for investigation, and

promise of success. The efforts of Mr. Babcock in the direction of acquiring useful data are demonstrated in his annual reports bearing on many matters of practical interest, and in the erection of a hatchery, most modern in its equipment and of great capacity, near Seton Lake, in the Lillooet District.

Salmon Canning.

The methods used in handling and packing salmon have been greatly improved—to such an extent, in fact, that after the fish is taken from the net it is



Spring Salmon.

though a good deal has been accomplished there is still much to be learned.

The facts as to the conditions governing and affecting spawning; the time of their going to sea; the effects, injurious or otherwise, of dumping the offal of the canneries into the river; the economic results

practically untouched by hand during the process of cleaning, cutting up and canning. The canneries are now equipped with ingenious machines, which perform the work with a rapidity and precision unattainable in the old days, when Indians and Chinese were employed. The salmon are taken from the boats by a

conveyor which delivers them on a table convenient to a machine called the "Iron Chink," which does the work of many Chinamen, and from whom it derives its name. The Chink is fitted with an intricate arrangement of knives and cutters which slice off the heads, tails and fins, scales and splits the fish and removes the entrails. Another conveyor takes the fish to the cutter, where it is divided into convenient pieces to fit the cans. During these processes the fish is sprayed continuously with water, so that it is thoroughly cleaned. The fish is then packed in the cans, which are soldered as they pass along a belt to the test tanks. These are large tanks in which the cans are submerged so as to detect any defect in sealing. Should bubbles rise the defective cans are set aside. Next the cans are placed in a retort, where they are subjected to a high degree of heat, which thoroughly cooks the fish. After the cooking the cans are conveyed to the labelling and packing rooms,

wonderful scene at the mouth of the Fraser River during the sock-eye run to note the myriad lights of the fishing boats drifting in the estuary. From the shore it seems as though one were looking at a veritable town afloat. The nets are also set during the day if the water is sufficiently muddy to hide the twine.

After drifting for a certain time, the nets are hauled aboard the boat over a stern roller, and the gilled salmon extricated, clubbed and hove into a pen in the bottom. After the night's haul, the fishermen may pull or sail into the cannery with their fish or discharge into a cannery tender. In the latter case, the fishermen remain on the fishing grounds until the week-end close time or bad weather forces them to come to port.

Another method of fishing is by means of trolling lines from row and motor boats. Spring and Coho salmon are caught in great numbers by trolling in the channels. Trollers set either baited hooks or spoons on lines suspended from four or more rods fixed to the hull



A Fraser River Cannery Wharf.

where they are made ready for shipping. In every stage from its capture to its final cooking, the fish is carefully kept from contamination, every possible precaution being taken to ensure cleanliness.

Method of Capture.

 THE bulk of the salmon taken in British Columbia is caught by means of gill-nets set from small row and sail boats in the estuaries, inlets and rivers. The nets, of varying length, may be either "set nets" or "drift nets." The former are anchored so as to remain in a certain location by being made fast to stakes or anchors, while in drift net fishing, one end of the net is buoyed, and the fishermen pay the rest of the "twine" out across tide or current and drift to the last end. The nets used are made of flax, cotton or linen twine, tan-barked, with cork or wooden floats along the head rope and leads along the foot.

The drift net fishing is usually carried on at night, when the darkness hides the entangling meshes from the sight of the salmon heading upstream, and it is a

of the boat. Rowing or motoring ahead, the trolls are towed astern and hauled in when a salmon has taken the hook.

Salmon trap nets, which are the principal means of catching salmon in U.S. waters, are not general in British Columbia, though there are a few on Vancouver Island, and they were only allowed in order that our fishermen may be placed on an equality with the American fishermen on the Straits of San Juan de Fuca, who, by their use, were catching enormous quantities of the salmon heading for British Columbia waters. The salmon trap is an expensive structure, consisting of stakes driven into the bottom and leading out from the shore. The spaces between the stakes are walled in by wire or net webbing, and the whole trap is designed so as to turn the schooling fish coming in from sea, into several chambers, and finally into the "pot" and "spiller." The latter chamber is so arranged that it can be brailled up by windlass or derrick, and the trapped fish dumped into a scow or on the deck of a tender. The salmon

trap is similar in design and purpose to the pound nets of the Great Lakes, and the herring weirs of the Atlantic coast.

Yet another appliance is used for catching the salmon—the fish wheel. This is an Indian invention, we believe, and the one illustrated herewith is located on the Yukon River, Canada. The current turns the wheel which is equipped with two or more scoops. The fish caught in these revolving scoops are simply thrown into a pan or net placed in the right position to receive them. Other Indian methods of fishing salmon are by means of hand-gaffs and dip-nets.

The purse seine is also used in the salmon fishery of the Pacific. These are set from gas boats from a platform built on the stern of the craft. On sighting the schooling fish, the seiner heads towards them, launches her dory or seine boat with a man in it to hold the end of the net, and then, paying out the "twine" from the platform aft, encircles the fish by coming around to the seine boat again. The seine is pursed up by means of brail running along the bottom, and the net is hauled in

small boats in all weathers—gives them an occupation which does not appeal to the white man, though there are a number of the latter in the fishery as well.

In the trollers and seiners, cannery tenders, traps and shore workers, the white men are to be found. As workers in the canneries, Indians (men and women), and Chinamen are employed. The Indian is also a fisherman.

Value of the Salmon Fishery.



WITHIN the last five years, the salmon pack of British Columbia has averaged between 1,000,000 and 1,100,000 cases annually. This pack is only exceeded by that of Alaska. The pack is made up largely of sockeye, pink and chum, with coho, spring or chinook, in lesser proportion.

In the prosecution of the salmon fishery and the canning industry an enormous quantity of supplies is necessary. Many of the canneries are in isolated places, and when the season opens everything necessary for the prosecution of the fishery has to be freighted to them. The canneries often constitute settlements in them-



A Fishing Wheel on the Yukon.

—Photo, Janet M. Cumming.

by power or hand and the fish in the bunt are dipped out by dip-net.

Another method of catching the salmon in Canada is worthy of mention. A Grand Trunk Pacific train was stalled on the banks of the Skeena, and a keen disciple of Isaak Walton among the passengers noticed the salmon heading up the river close to the shore. With a window pole and a clothes-net, such as are found in the sleeping berths, he hied to the water's edge, and landed three or four fine salmon in a few minutes. The salmon were served up in the dining car later.

Salmon Fishermen.

The fishermen engaged in the salmon fishery of British Columbia are cosmopolitan, and include Britishers, Americans, Scandinavians, Chinese, Japanese and native Indians—briefly summarized in three classes as whites, orientals and Indians. The Japanese are extremely numerous in the gill-net fishery, and the arduous nature of the life—on the water day and night in

themselves, with cottages, shacks, bunk-houses, boarding houses, and stores for the employees who migrate there for the season.

The heaviest supply item is tin-plate for manufacturing cans, if the cans are made at the cannery, or the cans themselves. Then comes the boxes for packing the cans and the incidentals in connection with the cans themselves, as solder, acids, labels and paste. When one figures that a million or more cases and forty-eight million cans are used in a season's pack, some idea of the quantity of wood, tin, nails and incidentals required may be gathered.

The cannery owners usually supply the gear for catching the fish. This includes boats and nets, rope, canvas, and the hundred and one things for floating craft; gasolene and kerosene for propulsion of boats, tenders, and lighting. Coal for the boilers of the cannery; food-stuffs, gasolene engines, rubber boots, oiled clothing, clothing for men, women and children, tar,

paint, tools, labor-saving machinery, stationery and office equipment, tobacco, crockery, cooking utensils, etc. These are all items purchased heavily for the carrying on of the work. Other heavy items are freight charges, insurance and storage.

It can be readily seen that with such heavy outlays, a great deal of capital must be invested in the salmon fishery before profitable returns are made. Even though the fish are so prolific and easily caught, it is not all found money, and the successful prosecution of the salmon canning industry calls for much in good judgment, reduction of operating costs without the sacrifice of efficiency, and the ability to take charge of spasmodic runs of fish with labour and material always ready.

The Halibut Fishery.



SECOND in importance to the salmon is the Pacific halibut fishery. The catch of halibut by British Columbia fishermen amounted to around 200,000 cwts. last year. Two years

proper lie within the hundred fathom limit of the coast from the Straits of San Juan de Fuca to Dixon Entrance — almost four hundred miles of latitude. Within this area and including the territorial waters inside the three-mile-limit, halibut are found in more or less abundance at certain seasons. The heavy fishing of recent years, however, has caused a depletion in these inshore grounds, and while big trips are still taken from these waters, yet there is undoubted evidence that the yield is falling off yearly, and that the grounds must be given a chance to become restocked.

The halibut banks adjacent to the Province, and where the bulk of the halibut is caught nowadays is in the Gulf of Alaska, from Dixon Entrance to the Aleutian Islands. This area is open to our fishermen outside the three-mile-limit — Alaska being United States territory—and huge fares are taken there by British Columbia fishermen. As in the inshore grounds, the catch is falling off yearly, and the hali-



Cannery Tender Picking up Salmon from Boats.

previously, the catch was 223,000 cwts., and the latest statistics show a decrease, though the value of the fish has risen considerably.

The decrease in the catch of halibut is giving rise to fears that the extremely heavy fishing of the banks by both Canadian and American halibuters is depleting the supply. Proposals to conserve this valuable flat-fish by closed seasons or restricted fishery are important questions for both Canada and the United States, and before long something must be done.

The centres of the halibut fishery are Prince Rupert, Vancouver and Steveston. At these ports are located the plants of the Canadian Fish & Cold Storage Co., Ltd.; the Canadian Fishing Co., Ltd.; New England Fish Co., Ltd.; R. C. Packers' Association; Western Packers, Ltd., and others.

Halibut Fishing Grounds.

The halibut fishing grounds of British Columbia

but will have to be protected in some way to prevent extinction.

Method of Capture.



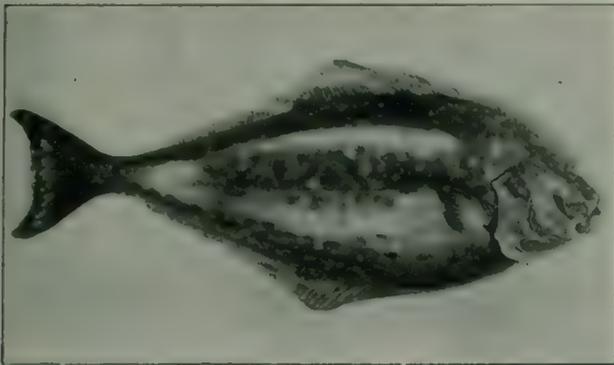
THE halibut fishery is practically a hook and line operation, though a few are caught by the steam otter trawler now operating out of Prince Rupert. The vessels employed range from small gasoline boats carrying four to ten men and using long lines and dories, to large auxiliary schooners and steamers operating entirely with long lines or dories, or both.

The dory fishing is by means of trawls, and was introduced on the coast by Atlantic halibut fishermen. The trawls, as used in the dory halibuters, consist of 7 "lines" or "shots" of a heavy tarred cotton trawl of 28 lb. line, all bent together and called a "skate." Each shot or line is 50 fathoms in length, and the whole skate is 350 fathoms. Unlike Atlantic haddock or cod

trawls, halibut gear is not coiled down in tubs, but is lashed up on a square piece of canvas with tying ropes seized into each corner. The resemblance of this canvas jacket to a skate-fish probably accounts for the name.

On this ground line, and bent into beckets hitched into it at intervals of from 8 to 12 feet, are 14 lb. snoods or gangens, to which heavy halibut hooks—either Mustad's No. 6283, Arthur James, or others—are seized—the whole rigging making up a skate of halibut gear.

Arriving on the fishing ground, the fishermen—two to a dory—bait up from eight to ten of these skates with herring or shack bait—the latter may be pieces of dogfish, cod, etc.—and swinging out their dories, proceed to set the skates of baited gear on the bank.



Halibut.

An anchor with a buoy and line attached is thrown over first, and to the ring or crown of the anchor is bent the first end of the skate. One fisherman rows the dory, while the other heaves out the baited gear, skate after skate, until the whole has been set. Another anchor and buoy is made fast to the last end.

After being on the bottom for an hour or so, the fishermen haul up the last anchor and proceed to get the gear in. In the bow of the dory, a lignum vitae roller is placed in the gunwale, and the bow man pulls the line in over it. His dory-mate, immediately aft of him, gaffs the fish as they come up on the hooks; clubs them if necessary, and hauls them into the boat. He also coils the gear down as it is hauled in. The fish are laid in a square net with iron cringles worked in at each corner, and when all the gear has been hauled and the dory has come alongside the parent vessel, a tackle is hooked into the four corners of the net and the fish are thus hoisted aboard.

A small hand-winch, known as a gurdy, which fits over the bow gunwales of the dory, is also used for heaving up trawl, and is very necessary for breaking out the anchor, or disengaging the trawl when snarled up on hard bottom.

The dory is a type of boat peculiar to the fisheries only. It is an Eastern product evolved by the New England and Nova Scotia fishermen, and while simple of construction, and ugly in appearance, is a wonderful sea boat when properly managed. The dory used in the Pacific halibut fisheries is larger and heavier in construction than the Atlantic type, and is strong enough to be hoisted bodily aboard with men and gear in them.

The dory halibut fishing vessels of British Columbia range from the small power boat carrying three or four dories and ten men, to the big steamers, of the British

trawler type, carrying twelve dories and a crew of thirty-five. The smaller craft fish in the inside channels of the coast, and the inshore banks, while the larger craft make the long voyages to the Gulf of Alaska—often steaming from Vancouver as far west as the Kodiak and Shumagin Islands.

Another method, which dispenses with dories altogether, is long lining. This is an Old Country manner of fishing, and was successfully introduced on the Pacific Coast by the Canadian Fish & Cold Storage Co., Ltd., of Prince Rupert, who imported the gear and the crews to operate it from Grimsby, England. The long-lining, as practised by them, is worked from steamers of the British trawler type. The gear is rigged of three stranded Italian hemp, 7-8ths circumference, tan barked, with gangens of 14lb. tarred cotton, one fathom long, bent into beckets hitched into the ground line at 8 or 9 foot intervals. The hooks are seized on and are the same as in the dory gear. Eight lines of 37 fathoms each usually make a long line skate.

When ready to set the baited gear, the skates are all placed aft on the quarter of the steamer. With the vessel steaming slow or dead slow ahead, the fishermen heave the first buoy over, and while the buoy line is running out, the first end of the baited gear is made fast to the buoy anchor. The buoy used is usually a keg or cork float with a twelve foot spar through it, and a colored flag attached. The bottom of the spar is weighted to keep it floating upright. The anchors are a trifle heavier than the usual halibut trawl anchors.

When the first skate has been bent on, the anchor is hove over the stern of the steamer, and one of the fishermen heaves the trawl overboard by means of a heaving stick—pausing when some 50 to 100 fathoms have been paid out to allow the trawl to be tautened up. After five skates have been set in the manner describ-



Motor Dory Halibuter.

ed, another buoy and anchor are bent on to the end line of the fifth skate and the first end of the sixth is also attached. These five buoyed and anchored skates are known as a "shank." From six to eight of these shanks may be set, which means from thirty to forty skates of gear. The gear may be set in shanks running in one continuous line, or in separate shanks parallel or at angles to each other—the setting depend-

ing on the size of the bank, the run of the fish, and the depth of water.

In hauling the gear, the anchor and buoys are brought aboard and the first end of the skate is led over a roller placed on either the port or starboard rail on the main-deck forward, and thence to a steam gurdy winch located in the centre of the deck and just abaft the fore mast. The fishermen take up their stations—one tending the line at the winch, one at the roller on the rail, two with gaffs to gaff the fish as soon as they appear at the surface, and others clearing the fish from the hooks, coiling down the trawl and re-baiting again ready for the next set.

The skipper or mate are in the wheel-house watching the trawl coming and working the ship's engines to ensure that the vessel does not strain on the gear or get too far over it. The engines and the wheel are worked almost continually in tending trawl.

ly a long liner. Otter trawl gear consists of a huge bag net, cone shaped, the mouth of which is kept open by what are known as "otter boards." The whole gear is lowered into the water by steel wire warps attached to the boards, and towed astern of the vessel. The net is dragged over the bottom for a certain length of time, and then hauled up by steam winch. A strop is placed around the cone, or "cod end" of the net, and the whole hove aboard by a derrick. The cod-end containing the fish is opened and the catch falls on deck. Among the many species of fish caught are a number of halibut.

Market for Halibut.

IN addition to the home market in Canada, great quantities of British Columbia halibut goes to the Eastern United States, in a fresh and frozen state. Of late years, quite a trade in frozen B.C. halibut has been built up in Great



Steam Dory Halibuter.

Long lining has the advantage of dispensing with dories altogether, and working with less of a crew. It can also be worked in rough weather when it would be impossible to put dories over. The dory boats, however, can cover a bank better, and both systems have their merits. This has been recognized and a number of the big steam halibuters out of Vancouver and Seattle have been fitted with both long lines and dory gear. The long line gear has also been fitted on small motor craft in the Coast fisheries.

Illustrated herewith are types of the vessels employed in the halibut fishery of British Columbia. Some are converted British steam trawlers; others are American fishing steamers built on the Atlantic coast, and others are altered Atlantic bank fishing schooners. The motor halibuter is a purely Pacific Coast type evolved for the fishery there.

A new method of catching halibut is on the Coast, though not fitted primarily for that purpose, is steam otter trawling. This is being carried on from the trawler "James Carruthers" of Prince Rupert, former-

ly a long liner. The war, and the scarcity of fish in Great Britain, has given quite an impetus to this business and the British people have, to a great extent, overcome their prejudice to frozen or glazed fish. The Canadian soldiers in England have been receiving rations of frozen halibut for over a year now. So much publicity has been given the Pacific halibut in England of late, that several Imperialistic schemes are being mooted whereby this fishery is proposed to become a Government monopoly. Such however, we do not think will ever mature.

The Pacific Cod Fishery.



FOLLOWING the halibut, we give third place to the Pacific cod, as we believe, in the future, that this fishery will become one of the most valuable and important in British Columbia. The present year has seen quite a boom in the use and marketing of the Pacific black cod, and large shipments of this fish have been sent overseas to Great Britain.

There are two species of cod in Pacific waters—grey and black. The former is similar to the codfish of Atlantic fame, and the latter, though somewhat the same in build, is of darker colour and entirely different in taste. Some people claim that the black cod is superior as a food fish to the common cod. However, this is entirely a matter of opinion and taste, but there is no doubt whatever but what the black cod is an excellent food-fish with a promising future.

The black cod has recently been the subject of a Publicity Campaign by the United States Bureau of Fisheries, and re-named "sable-fish," it has been introduced in eastern markets with great success. Fresh, filleted and smoked, it is the "finnan haddie"

late, the fish orders for overseas has called for huge quantities of sable-fish, and the fishery has received an impetus accordingly. There is no doubt whatever but what the sable-fish will constitute an important fishery in the near future.

The grey cod is a native of the far northern waters, and the Bering Sea. The fishery is largely carried on by U. S. firms from San Francisco and Washington ports, who salt and dry the fish for home and export. Canadians have not yet made a permanent fishery after this fish, though two ventures were made in 1903 and 1913 by the Western Canadian Fish Co., of Bar-net, and the Canadian Fish and Cold Storage Co., Ltd., of Prince Rupert. The latter company fitted out the



Auxiliary Dory Halibuter. Atlantic Bank Fishing Schooner Remodelled.

of the Pacific, and will become, in time, as popular as the latter.

Method of Capture.

 THE bulk of the sable-fish caught to-day is by hook and line and a large proportion are caught on halibut gear, and are brought in by the halibuters. No large vessels fit out for catching sable-fish exclusively, though a few small craft do so. Many are picked up in the otter trawl gear now being used out of Prince Rupert. They are also caught on hand-lines by local boat fishermen. As the market has only been a local one, with a limited demand, sable-fish was regarded as being of no value by the halibut fishermen who caught them on their hooks, and they were thrown back into the sea. Of

three-mast schooner "Albert Meyer," and sent her to the Bering Sea. She brought back 100,000 fish, but the market was "off," and the venture was not continued. With steadier markets and increased demand for fish, the grey cod is another future exploitation for British Columbia fishermen. This fish is caught almost exclusively by handlines from vessel and dory.

Herring.

 ACCORDING to the last statistics, something like \$876,851 worth of herring were caught and prepared in British Columbia. The catch for the year ending March 31st, 1917, will probably exceed this. Some account of this fishery is given in a Provincial publication, and we reprint it herewith.

"Although there is a great abundance of herring in British Columbia waters, the catching and curing of these fish is only beginning to secure the attention which its importance deserves. The Atlantic herring fishery has been a profitable branch of the fishing industry for many years, herring occupying the fourth place on the list of principal commercial fishes, from 1869 to 1908, and yielding in that period an average value of over \$2,000,000 annually. Canadian herring have always had as strong rivals in the foreign markets, the Scottish, Norwegian and Dutch products, although they were declared by experts to be quite equal to their competitors in size, quality and flavour, the drawback to their acceptance being defective methods of curing and packing, which resulted in deterioration if they were kept for a considerable time. To overcome this defect the Dominion Fisheries Department engaged the services of Mr. John J. Cowie, of Lossiemouth, Scotland, an expert herring curer, and a crew of Scotch fishermen and curers, to conduct a series of experiments on the coast of Nova Scotia, and prove once for all the truth or fallacy of Canada's claims. These experiments were carried out during the season

"Nanaimo seems to be the chief seat of the herring fishery, so far, in British Columbia.

"From the middle of November on to the month of March, herring come into the harbour of Nanaimo in such apparently incredible quantities that, during some seasons, they are left stranded on the beach in huge masses, and become a nuisance as they lie rotting there.

"The herring of the Pacific coast appear to be, generally speaking, of a smaller class, and contain a far greater amount of oil than the herring of the Atlantic.

"While I found that these Pacific herring make very good kippers, they may not prove to be so well adapted as the Atlantic herring for curing purposes, owing to the great amount of oil they contain, even after the roe and milt has formed in them.

"When I say that these herring differ from the Atlantic herring for purposes of curing, I do not mean that they cannot be cured, but that they will not keep in good condition for such a length of time as the herring of the Atlantic.

"The more oil there is in herring, the more difficult they are to cure in pickle, and the sooner they go



Pacific Long Line Halibuter.

of 1904, and proved that the quality of Canadian herring is all that can be desired, and that the conditions necessary to gain for our herring the highest repute and the most remunerative prices are:—(a.) Gutting and curing as soon as possible after capture; (b.) Separation and proper selection of fish according to grade; (c.) Use of the right kind and quality of salt; (d.) Proper packing for shipment to market. By strict adherence to these rules and certain minor details, Mr. Cowie established the fact that Canadian herring could take rank with and command as good prices as the best products of Scotland, Holland or Norway, the latter being established by experimental shipments to New York and St. Petersburg, which were disposed of at prices much higher than could be obtained for fish cured and packed by the old methods. Mr. Cowie and his staff will continue the experiments this year at other points of the Atlantic, and will also visit this Coast.

At the close of the herring fishing season on the Atlantic coast, Mr. Cowie paid a visit to Nanaimo, with a view of finding out if the industry here is capable of development along the lines proposed on the Atlantic coast. The following extract from his report gives the results of his observations:—

wrong and lose quality. An excess of oil seems to be a prominent feature of all kinds of fish on the Pacific coast, owing, possibly, to the equable temperature of the water and the richness of the food they live on.

"Notwithstanding this, however, attempts have been made within the last four years to cure these herring for export, with no little success. The method of curing which has been adopted is a good deal similar to the Scotch method, and, in my opinion, the trade may be developed along the lines on which they have started, with some slight improvements regarding details.

"The barrel in use there is an admirable one, and is far ahead of the herring barrel in use on the Atlantic coast. It is strongly made, hooped with galvanized iron hoops, and is capable of carrying cured herring to any part of the world in good condition.

"The use of a similar barrel on the Atlantic coast would go far towards improving the present condition of the herring trade of the East.

"The salt in use, however, is, I consider, quite against the proper curing of Pacific herring.

"Trial shipments, I was told, had been made to Australia and New York, and in spite of the poor quality of the salt, and some defects in the curing pro-

cess, have met with a very favourable reception, especially in Australia.

"I found there is a demand springing up for Pacific herring in China, not cured in pickle, but dry salted in boxes, and I believe extensive shipments of herring put up in that way will be made this season to that country.

"While there may not be a great demand for those Pacific herring in eastern Canadian or American markets, as there they will come into competition with a better class of fish, I believe there is a large outlet for them in the western states of America, in Australia, the west coast of South America, China and the Straits Settlements, if properly attended to.

"To improve the already fairly effective methods of curing in vogue in British Columbia, and as the people there are keenly anxious for such improvement, I would

pounds in five years, the figures being:—1903, 3,620,000 pounds; 1908, 45,146,800 pounds. Smoked herring, too, shows an increase of over 25 per cent. Japanese fishermen have embarked in the herring fishing at Nanaimo in recent years, catching and salting large quantities of fish, which are exported to Japan.

Method of Capture.



HERRING are largely caught in purse seines from motor boats. The illustrations give some idea of the enormous quantities caught at a haul. The run is so heavy at times that a twenty-ton scow load can be dipped up in a few hours.

Flounders and Flatfish.

The king of the flatfishes—the halibut—has so long overshadowed the other members of the tribe, that but little attention has been given to them. Large



Fishing from a Long Line Halibuter.

suggest that, as the herring season on the Pacific only begins after the season on the Atlantic has closed, next year three gutting girls and a cooper be sent to the Pacific coast, after operations have ceased on the Atlantic coast, to give a month's instruction in herring curing."

In his report for 1903, Mr. C. B. Sword, Dominion Inspector of Fisheries for British Columbia, notes an item of 3,500 cases of canned herring as a new venture, and remarks that there is no good reason why the fish put up in that way should not be marketed successfully.

In 1903, the run of herring was very large. At Nanaimo the fish invaded the harbour in such numbers that thousands were washed up on the beach, like seaweed, by the waves created by passing steamers.

The herring fishery is increasing rapidly in British Columbia, showing a gain of more than forty million

quantities of various species of flounder, turbot, sole and plaice are to be found in British Columbia waters and there will be a large future market for them. At the present time something like \$35,000 worth of soles have been marketed annually and \$12,000 worth of flounders. The Otter trawler out of Prince Rupert is catching great quantities of these fish which are frozen and exported to the British market where they are in great demand.

Other varieties of British Columbia fish of more or less importance as food-fish or other marketable products are well described in a pamphlet issued by the Provincial Government which reads as follows:

Sturgeon.

Another important fish, though not utilized to any large extent, is the sturgeon, the roe of which, when salted, forms caviare, and the bladders are manufactured into isinglass. The Pacific Coast sturgeon

(*Acipenser transmontanus*) enters the Fraser about the end of April, following up the oolachans, and spawn, although little or nothing is known about the period. They are taken by spearing or by night-lines, baited with salmon, and very often they are caught in the nets of the salmon fishers. They grow to enormous sizes, some of them weighing from 700 to 900 pounds, and it is said that the largest caught weighed over 1,000 pounds, although it is not authenticated. There is a small local market for sturgeon. A company was formed several years ago at New Westminster for the purpose of catching and export, which was done in a limited way. Mr. C. B. Sword, Inspector of Fisheries for the Dominion in British Columbia, in his report for 1901, says, regarding them:

"This fishery shows a very small return, 65,000 pounds against 105,000 in 1900, 278,650 pounds in 1899, 750,000 in 1898, and 1,137,696 pounds in 1897. It would not appear that we are ever likely again to see this fishery of any commercial importance. The cold storage companies take all they can get, but the

for the local demand. There is no lack of young sturgeon in the river (Fraser), so that it would appear that the large fish, formerly so common, had taken years to reach their growth, and, with the increased demand, the fishing has been too energetically prosecuted to allow the time needed for their development."

Professor Edward E. Prince, Dominion Commissioner of Fisheries, ranks the sturgeon as one of the most valuable of Canadian fishes. In his special report on the "Canadian Sturgeon and Caviare Industries," (37th Annual Report, Fisheries Branch, Department of Marine and Fisheries, 1904), he points out that Canada supplies 75 per cent. of the world's consumption of caviare, and gives a mass of interesting information regarding the fish, its distribution, habits, methods for its capture, and the preparation of caviare, isinglass, and other products. The quantity and value of sturgeon and caviare for the Dominion, in 1903, were: Sturgeon, 1,660,920 pounds, value \$146,860; caviare 64,835 pounds, value \$52,426; total value, \$199,286. The use of caviare has become more general



Dory Halibut Fishing—Clubbing a Big One.

supply, especially of the larger fish, is very limited. Several illegal lines have been seized and destroyed, but the scarcity of the fish makes the employment of this method no longer so profitable as it once was, and comparatively few of these are now used.

"There is no lack of small sturgeon in the river, so that the only reason for the failure of this fishery would seem to be the number of years that this fish takes to obtain its full growth. Until a market was found abroad for them, the local consumption was too small to affect their numbers, and many were taken of a size now rarely met with."

Sturgeon have also been taken in the interior lakes.

The above figures show that the catch of sturgeon has decreased very rapidly. In 1903, the total catch was only 30,000 pounds, and Mr. Sword says in his report for that year:

"This fishing is practically extinct. There are still fish of some size taken occasionally, but not enough

of late years, and in consequence it now sells as high as \$1 per pound, on the fishing ground, so that taking the yield of an average fish at 50 to 60 pounds of roe, the value would be \$50 to \$60 per fish, not reckoning the flesh, the bladder, the oil, and the skin, each having a distinct economic value. There is no other fish which yields so much, as every part of the sturgeon can be turned to profit. Named in the order of their commercial importance, the products of the sturgeon are:—(1) Caviare; (2) isinglass, made from the swim bladder; (3) the flesh, fresh, salted, smoked or otherwise prepared; (4) oil, which is of great value in the leather industry; (5) fertilizer, made from entrails and scrap; (6) the soft, gristly backbone, with its sheath, which, prepared, is called wesiga, and in Russia is an esteemed article of diet; (7) the brain and nerve cord removed from the gristle, when smoked and dried, is considered a great delicacy in China; (8) the back portion of the sturgeon, or dorsal region, is made into

balyki; (9) the ventral part, or belly, of the fish is made into a food called pupki; (10) a valuable glue, differing from the isinglass of the swim bladder, is made from the nose, fins, tail, etc., and, lastly (11) leather is made from the tough and dense skin. Mill belts and boot laces are made from sturgeon leather, and experiments have shown that a set of sturgeon leather laces will last as long as the belt itself.

The catch of sturgeon, in 1914-15, was 1149 cwts. valued at \$22,980 pounds.

Dogfish.

 THE waters of the North Pacific are infested with many varieties of small sharks (all known to the fisherman as dogfish), which are an endless source of vexation and loss to the deep-sea fishers. These coyotes of the sea, like their land brethren, skirmish on the flanks of the big schools of halibut, herring, cod and salmon, snatching their prey at unguarded moments, and when the fishermen lower their lines, pounce upon and devour the bait, while in the case of nets, they tangle themselves

In addition to its value as an oil fish, the dogfish of the Pacific may yet become important as a food, for their good qualities in that respect have long been recognized in Norway, the Channel Islands, the Hebrides, and in Scotland, while recently several of the canneries in Nova Scotia and Prince Edward Island have been successful in putting canned dogfish on the market which is said to be "superior to canned salmon." One brand of canned dogfish masquerades as "Japanese mackerel" and finds a ready sale. Since the above was written, the much despised dogfish has come to the forefront as a food-fish. Boomed by the U. S. Bureau of Fisheries, and renamed "gray-fish," the dogfish has been proved "a dog with a bad name," but valuable as a food. American canners, east and west, are now canning gray-fish and it is commanding a favorable market. Canadian fishermen have not taken it up to any extent as yet, but the future will undoubtedly see the gray-fish utilized as a food-fish and marketed.



Dressing Pacific Halibut.

up in the meshes, seemingly for very wantonness, a single dogfish often succeeding in wrapping himself up tightly in a 150 fathom net. The spike dogfish (*squalis sucklii*) and the tope shark (*geleorhinus galeus*) are the most common, and are found everywhere, and at all seasons, along the Coast. They are from two to five feet in length, and weigh from five to fifteen pounds. These creatures are exceedingly voracious and so destructive that on the Atlantic Coast, where the spike dogfish is very common, the Dominion Government established stations for their capture on a large scale, with a view to their extermination. At these stations the dogfish were converted into oil and fertilizers. The dogfish are very rich in oil, a very superior grade of lubricating and machine oil being extracted from the livers, while the bodies supply a large quantity of an inferior quality. The residue, after extraction of the oil, makes a good fertilizer.

Other Oil Fish.



IN addition to the dog fish, there are several other oil-bearing fishes, the principal of which is the ratfish (*Hydralagus colliciei*). It is found in great abundance in places, and the oil procured from its liver is used for the very finest work in watches, gun-locks, sewing machines, etc. It is a very prolific oil-bearer, and should prove to be valuable as the basis of an industry.

The basking shark (*Cetorhinus maximus*), is also plentiful in Queen Charlotte Sound during the summer months. It attains to a great size, is perfectly harmless, and so tame that while basking it may be touched by the hand. In England, 150 gallons of oil is the average yield of the liver, which alone is treated, but on the New England Coast the whole carcasses are utilized for the manufacture of fertilizer. The pro-

duction of fish oil and guano is inconsiderable, when the opportunities afforded for their manufacture are taken into account, the production for 1908 being: Fish oil and glue, 142,480 pounds, value \$56,600; guano, 84 tons, value \$2,350; total value, \$58,950. These figures cover only the oils and fertilizers made from dogfish and fish offal, and do not include the whole products, which were valued at \$357,500, in 1908. 1908.

The Oolachan and the Smelt.

The candle fish (*Thaleichthys Pacificus*), known locally as the oolachan, or eulachon, should be of considerable commercial value. It runs in enormous quantities up the rivers and inlets of the Coast, coming into the Naas about the middle or latter part of March, and reaching the Fraser about the middle of April, deteriorating somewhat in quality as it comes

success. The oolachans have many enemies besides the Indians. The seal, sturgeon, salmon and porpoise follow them in their run, and even bears and pigs gorge themselves on them when the opportunity offers. If they could be preserved, as indicated, for export, so as to retain their flavor and body, they could undoubtedly demand a sale co-extensive with sardines.

There are two varieties of smelts common in the local markets (*Osmerus thaleichthys* and *Hypomesus pretiosus*), which are in brisk demand.

Mr. Sword notes a substantial increase in the oolachan and smelt fisheries, and he remarks that as there has been no determined effort made to find a market abroad for these fishes, the figures given represent the local consumption, the Indians being the main consumers in the case of the oolachan. As both of these fish are unrivalled delicacies, it can only be a



One of the Big Modern Vancouver Halibuters, and ———

southward. This is a delicious pan fish and is greatly in favor in its season. It, however, like the skil, is too tender for carriage, and has, therefore, only a local market. It is about nine inches in length, and so plentiful at times when running as to be scooped up in bucketfuls. A good many are put up in pickle in small kits and cured like bloaters, but not much progress has been made in these directions, remarks applying similarly to those in regard to the skil.

The Indians catch them in immense quantities and extract the "oolachan grease," which they use much as we do butter. Oolachan oil, properly refined, might become of commercial value, there being practically no limit to their numbers. Experiments have been made with oolachan by bottling and canning, it is said, with

question of a short time before some method will be discovered for their preservation, whereby the flavor will be retained, and a large and profitable export business in them established. The quantity and value of oolachans and smelts for 1915 were: Oolachans, fresh, 13,642 cwts.; \$71,036. Smelts, 2,137 cwts.; \$17,856.

Whaling.

ONE cannot sail very far in any direction along the coast of British Columbia without seeing in the offing an occasional fountain of spray, followed by the flash of a mighty fluke, betraying the presence of a whale. Often in the Gulf of Georgia, or off the west coast of Vancouver Island, the traveller is treated to the sight of a school



of whales, apparently enjoying a titanic game of tag, or he may share in the excitement of a whale hunt, if fortunate enough to secure a berth on one of the steamers of the Pacific Whaling Company. This company has been operating for about four years with great success, the average catch being over 600 whales per season. The company has adopted modern methods, and instead of the old style of sailing ship and whale boats, employs fast steamers, which dash boldly alongside the whale and dispatch it with a well-directed shot from a machine gun. The carcass is then towed to the whaling station, where it is hauled on to a suitable stage by machinery and cut up so that every portion of the huge mammal is utilized. This method of whaling was established in Norway several years ago, and

yield: 6 tons of oil, worth \$450; 3½ tons of body bone, \$175; 3½ tons of guano, \$105, and three hundredweight of whalebone, worth \$48, or a total of \$778, which, after deducting expenses, estimated at \$206, would give a net profit of \$572. A humpback, which is a smaller whale, averaging about 27 tons, should give a profit of \$140, while a finback, weighing 50 tons, is credited with a gain of \$338. The right whale is much more rare than any of the others named, but offers a grand prize to the hunters, for he is worth \$10,000.

The Pacific Whaling Company has three stations on the coast of Vancouver Island, equipped with modern plant. On arrival at the station, the whale is raised from the water on an adjustable platform, for cutting up. Incisions are made in the carcass, run-



— One of the Older Auxiliary Type.

later in Newfoundland and Quebec. The profits of whaling by this system are large, average from 15 per cent. to 40 per cent.

Several species of whale are found in the North Pacific and Behring Sea, of which may be mentioned the sulphur-bottom (*Sibbaldius sulfureus*), the bow-head (*Balaena mysticetus*), the sharp-head finner (*Balænoptera davidsoni*), the right whale (*Balaena japonica*), and the humpback (*Megaptera verabilis*). The sulphur-bottom, which is the most common in British Columbia waters, grows to an enormous size, an average specimen weighing about 60 tons, and worth to its captors over \$500. A whale of this size should

ning from head to tail, and about a foot apart. This divides the blubber into long, narrow strips, which are then torn or stripped off by means of large hooks attached to wire ropes which are operated by a steam winch. The blubber is then cut into small squares and put through a mincing machine, from which it goes to the steam-heated "trying-out" tanks, where the oil is extracted. The residue of the blubber and the lean meat are converted into guano and glue. The body bones are crushed, ground, and sold as fertilizer, while the whale bone is carefully cut from the jaws, trimmed and shipped to Dundee, Scotland, the home of the whaling industry.

Whalers, operating in the Sea of Japan and Behring Sea, do a considerable trade in whale meat, which is extensively used for food in Japan. Instead of converting the "beef" into fertilizer it is salted and in this form commands a better price. The importation of whale meat into Japan amounts to over two million pounds, annually, representing a value of over \$50,000. Pickled whales' tails are esteemed a delicacy in Japan, and large quantities are shipped from this coast.

About two-thirds of the whales captured are cow-whales, either with suckling calves, or with young unborn, the females, being broader across the body and slower in movement, as well as yielding more oil, are more easily captured than the males. This, and the fact that whales are hunted at all seasons, should induce the authorities to adopt reasonable restrictive

ning these fish, but as yet no one has undertaken the business on an extensive scale.

Rockfish.

The bass and perch families are well represented in the coast waters of British Columbia, and are taken in considerable quantities to supply the local markets. The red and black bass are plentiful, and much esteemed. The perches and other viviparous surf fishes are very common about the shores, and are extensively used as food.

The tom-cod (*Microgadus proximus*) is caught in large numbers, and finds ready sale in the markets of the Coast cities.

Shad.

The Atlantic shad, which has been well established in the Pacific through plants of fry made in the Columbia and Sacramento Rivers, has worked its way north



A Room Where Halibut are Frozen and Glazed.

measures for the preservation of these valuable creatures. The indiscriminate slaughter of whales in the North Sea, the Atlantic, and Gulf of St. Lawrence, has practically destroyed the industry in those waters, and without protection the same thing is likely to occur on this coast.

Sardines and Anchovies.



BOTH the sardine (*Clupanodon coeruleus*) and the anchovy (*Engraulis mordax*) are quite plentiful in British Columbia waters. The sardine appears for a short period during the summer months, but the anchovy remains from May to November, and enters the bays and harbors in immense schools. These fish are said to be of excellent quality and to offer exceptional opportunity for their preparation as anchovy or "sardines." Some experiments have been made in can-

to Puget Sound and the Gulf of Georgia. It was first noticed in the Fraser River in 1888, and by 1896 it had increased to such an extent that the fisheries authorities deemed it expedient to make regulations governing its capture. The fish does not run in sufficient quantities to warrant its being fished for specially, but is taken incidentally with other fish. The catch is, however, increasing steadily, year by year, and in time the Pacific shad may become as important as its Atlantic progenitor.

The mackerel, which is the basis of an important industry on the Atlantic coast, is practically unknown in the North Pacific. Further south the bull's-eye, or chub mackerel (*Scomber colias*) is found in moderate abundance and is caught for local use. The northern limit of this fish is said to be Monterey Bay, California,

CANADIAN FISHERMAN



DANIEL J. BYRNE, Esq., Montreal, Que.
President of the Canadian Fisheries Association from
January, 1915, to January, 1917.



A. L. HAGER, Esq., Vancouver, B. C.
Second Vice-President, Canadian Fisheries Association and Chairman of the
Vancouver Branch of the Association

but during the winter of 1904, a specimen was caught near Nanaimo, B. C., and it is possible that it may appear in large numbers on this coast in the future.

Oysters.

The small native oyster (*Ostrea lurida*) is found in considerable quantities at many places along the coasts of British Columbia and Washington. On Puget Sound, the cultivation of the native oyster has received attention, and several companies are in suc-

ture in British Columbia, the supply for local consumption being drawn from the East and from Puget Sound. There is a good opening for a profitable business in oysters, as the demand increases with the growth of population. Experience has taught the oyster growers at Washington that an inexpensive dyke, which holds a small amount of water over the oyster at low tide, greatly enhances the value and productiveness of an oyster bed. Many of the dyked



A Scow Load of B. C. Herring.

cessful operation. Olympia, Wash., has become the centre of the oyster industry, and the Olympia oyster is esteemed everywhere on the Coast. Several firms have imported Atlantic seed oysters, and in many instances these plantations have produced good results. Although natural oyster beds exist at many points along the Straits and on the west coast of Vancouver Island, very little has been done in oyster cul-

ture in British Columbia, the supply for local consumption being drawn from the East and from Puget Sound. There is a good opening for a profitable business in oysters, as the demand increases with the growth of population. Experience has taught the oyster growers at Washington that an inexpensive dyke, which holds a small amount of water over the oyster at low tide, greatly enhances the value and productiveness of an oyster bed. Many of the dyked beds yield from 100 to 350 sacks of oysters per acre each season, some producing as high as 500 sacks. The grower receives from \$4.50 to \$5 per sack, and as the cost of raising and marketing is about \$1.25 per sack, a handsome margin of profit is left. British Columbia's production of oysters for 1914 was valued at \$28,619.



Herring Fishing in Prince Rupert Harbour.

Clams and Other Mollusks.



CLAMS, of various species, are found nearly everywhere on the Coast, and their value as food is being recognized by the establishment of clam canneries at various points. The business promises to become important and profitable. The output of canned clams for 1915 was 5,045 cases, valued at \$40,360. The total catch is valued at \$84,097.

The abalone, a large mollusk, sometimes growing to the size of a soup plate, is quite common, and is by many esteemed a delicacy. Cockles, mussels, and other edible shell fish are very abundant, and are more or less sought for as food, and although such "small deer" of the sea are barely reckoned in estimating the commercial importance of our fisheries, they, in the aggregate, contribute a very considerable amount to the annual value of the industry.

Crabs, Shrimps, Etc.

Large crabs, belonging to the genus *Cancer*, are very common, and at certain seasons come up on the shores, in some localities, in large numbers. They are in great demand for food, taking the place of the lobster, which is not found in the Pacific. The catch of crabs is little more than enough to supply the local demand, for no special effort is made to capture them. The business of canning crabs has been essayed recently by a couple of firms, and this will doubtless stimulate crab fishing. Crabs to the value of \$44,588.



A Fraser River Sturgeon.

were marketed during 1914-5, a substantial increase over previous years.

Shrimps and prawns of good quality are plentiful, but they are not much fished for, and little information regarding them can be obtained. The habits of these creatures are such as to place them generally outside the ordinary range of observation, so that

fishermen may be scarcely aware of their presence, when an active search might disclose them in abundance. At least two species of prawns, one of large size, the other smaller, are seen on the local markets. The principal fishing ground, so far, has been in the neighborhood of Victoria, and in the southern part of Puget Sound. Shrimps and prawns to a value of \$6,000 to \$7,000 are taken annually.

Beche-de-mer, or trepang, is quite plentiful in the North Pacific, but it is not sought as a commercial commodity. Chinese and Japanese fishermen collect it in small quantities for their own use, but incidentally



Packing Herring.

in their regular business. Beche-de-mer (*Holothuria edulis*) is also known as sea slug, sea cucumber, sea pudding. It is highly esteemed for food in China, where it is imported in large quantities. The animal is repulsive, resembling a big, fat worm, from 6 to 2 inches in length, and is prepared for use by boiling and drying over a wood fire, or in the sun. China imports beche-de-mer to the value of \$650,000 annually.

As already stated, there are no lobsters known to be native to the Pacific. Several years ago, the Dominion Department of Fisheries liberated a car-load of young lobsters in the Gulf of Georgia, but they either died from the effects of the journey across the continent, or were destroyed by some natural enemy, as nothing was ever seen of them. The Department repeated the experiment in 1906, but so far the results have not been ascertained, although lobsters are reported to have been seen near where they were liberated.

Game Fish.



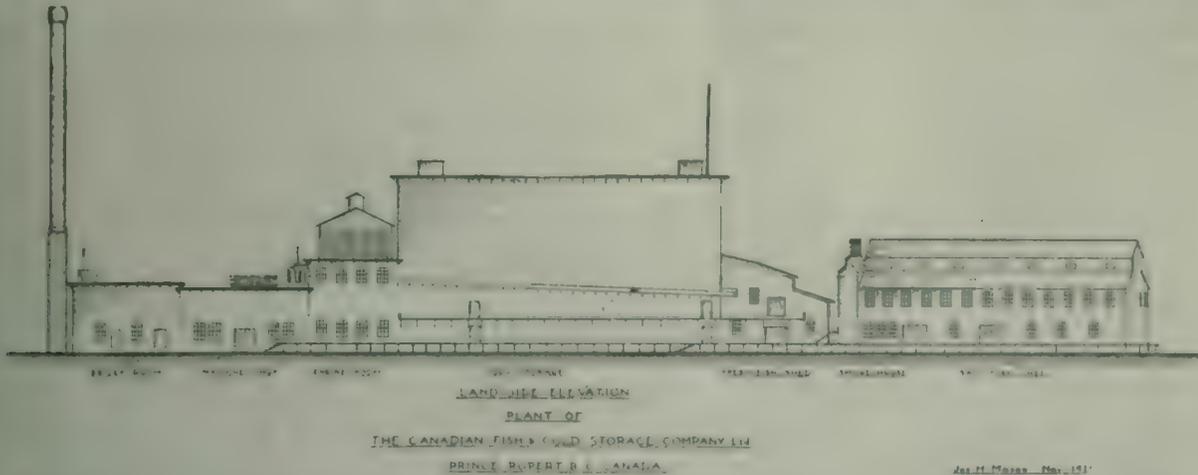
SO far the fishes of British Columbia have been treated from an economic point of view, but from a sportsman's standpoint the field is not a less interesting one. The whole interior of the Province, Island and Mainland, possesses a wonderful system of water communication, lakes and rivers. These, as well as the lesser streams, are abundantly stocked with fish, principally salmon or trout, the several varieties of which have already been enumerated. There are also whitefish in the northern waters. While the best known and favorite resorts are on Vancouver Island, there is no locality where a fisherman may not prosecute with zest this time-honored sport; and even on the sea-coast, during

the salmon run, with trolling line he will meet with gratifying success. The waters of Kootenay and Southern Yale are already becoming noted as fishing resorts, and when lines of communication are opened up, the rivers and lakes of the whole interior will attract numerous fishermen, affording, as they do, fish of uncommon size and number. The scenery, too, everywhere is on a grand and picturesque scale, and all natural conditions are healthful and invigorating.

British Columbia Trout.

The waters of the Province are rich in trout. No other section of the Dominion offers better fishing than

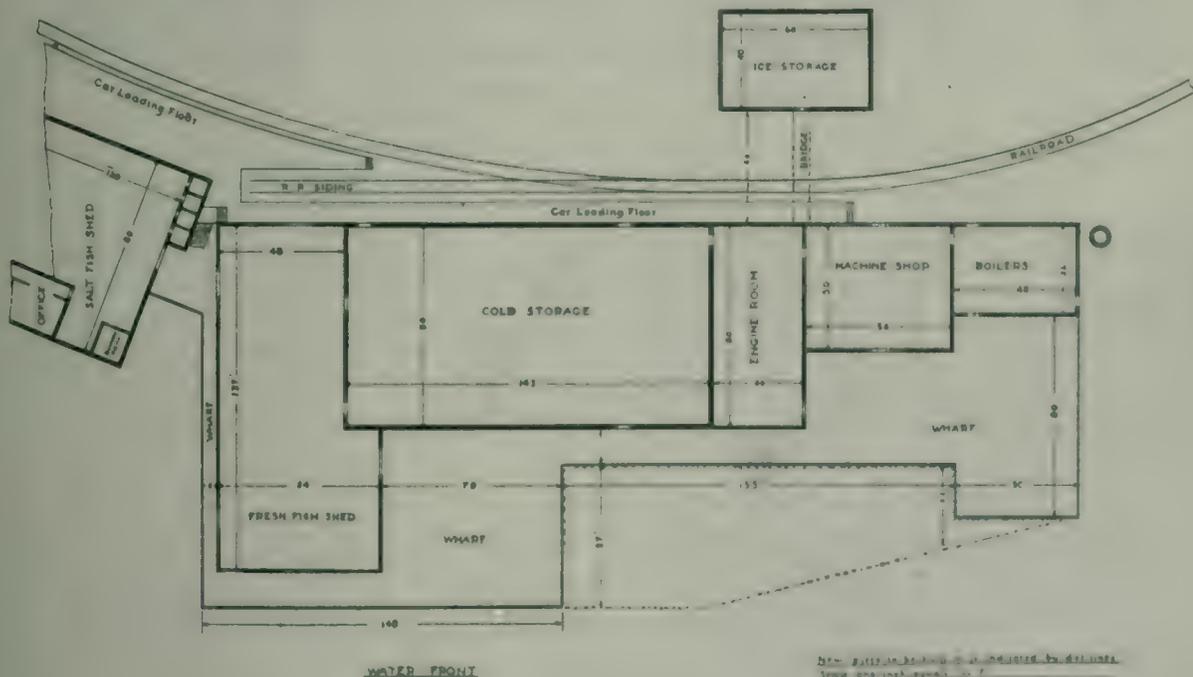
but, unlike our salmon, it survives after spawning, and returns to the sea. It feeds at all times freely in fresh and salt waters. Commercially the steelhead is of importance. It is commonly found in our markets from early fall until late spring. A considerable quantity is shipped East in cold storage. It finds ready sale in all local and Eastern markets; and because of the demand for it in a fresh state, the entire catch is marketed in that way. In our waters it averages about 12 pounds in weight, though specimens weighing from 20 to 24 pounds are not uncommon. As a "game fish" the steelhead is considered by many fishermen to have no



can be found here. Of the varieties of trout found in the rivers, streams and lakes of the Province, the steelhead trout (*Salmo gairdneri*) is the best known and most highly considered, because of its abundance, great size, and "game" and commercial qualities. From its being more or less anadromous in its habits, it is locally and in many Coast sections classified with the Pacific salmon. The steelhead more closely resembles in form, color of flesh, and habit, the Atlantic salmon than any other form found on the Pacific coast. It, like our salmon, spawns in fresh water only,

equal in fresh water. It readily takes a fly or spoon bait, and "puts up a stiff fight, taxing the skill of the angler and the strength of his tackle to bring it to net or gaff."

There are numerous forms of trout to be found in the Upper Fraser and Thompson Rivers, and in many of their tributary lakes, that cannot be distinguished by any technical character from the steelhead, but which, because of the many differences in habit, form and color, have been given many different names. Of



Plan of Rupert Cold Storage.

these, perhaps the best known of anglers is the very game fish which abounds in the Kamloops, Shuswap, Okanagan and Kootenay Lake regions, to which Dr. Jordan gave the name of Kamloops trout (*Salmo Kamloops*). The smaller specimens of this trout readily take a fly, but the largest specimens are seldom secured except by means of trolling.

In addition to the salmon and trout which abound in our waters, we have the Great Lake trout (*Christicomer namaycush*) and the Dolly Varden trout (*salvelinus parkei*), which are easily distinguished from the true trout by their red or orange spots. These last two—which should be called charr—while abundant in most of our interior waters, are not considered of great importance to the angler, because only the young ones are taken by means of a fly. Both these fish attain a large size, the Great Lake trout not uncommonly weighing as high as 30 pounds, while the Dolly Varden

Conclusion.

The fisheries of British Columbia are practically virgin ground. As stated before, practically only three species have been exploited to any extent, viz., salmon, halibut and herring. The countless other varieties of food and other marketable fish are yet to be exploited and the fishery for them developed. With the enormous fishery resources with which the province is endowed, there is no doubt about their future. With a larger home consumption of fish, which will come through a policy of educating the consumer; with a greater influx of a fish eating population from war impoverished Europe, and the increasing cost of meat foods all over the world, British Columbia has in her abundant fish resources, a huge field for future development, and it will develop providing care is exercised in its exploitation and capital judiciously and economically used for the purpose.



Salmon Fishermen on the Skeena River.

often weighs from 15 to 20 pounds.

Sealing.

 FUR seal hunting was for many years one of British Columbia's most profitable industries, but owing to the restrictions imposed upon Canadian sealers as a result of the Behring Sea award, the business has fallen away very considerably. The annual catch decreased from an average of 62,600 skins for five years ending 1894, to 16,500 for the five years ending 1903. In 1905, the sealing fleet consisted of 37 schooners, employing 518 hunters (188 whites and 330 Indians), and the catch was 13,798 skins. In 1906, the catch was 10,370 skins, in 1907, 5,397 skins; and in 1914-5, 352 skins, the smallest on record.

In addition to the fur seal, large numbers of hair, or Labrador seals, are killed annually, the catch in 1914-5 being 2,050 skins, valued at \$512. A few pelts of the valuable sea otter are also taken every year by the sealers and other hunters.

(Editor's Note.—The statistics used in this article have been taken from various sources and are given merely as an index of the values of the various fisheries. As the statistics for Canada's fisheries during the year ending March, 1917, have not been given out at the time of writing, it is quite possible that certain of British Columbia's fisheries during the year have shown increases and decreases, more or less than the figures quoted).

Mr. Herbert A. Rich, of the H. A. Rich Company of the Boston Fish Pier, Boston, accompanied by Mrs. H. A. Rich, is visiting the Pacific Coast. They came West on the Canadian Pacific, stopping a few days in Vancouver, and returned via Seattle, Portland, San Francisco, and the Southern route.

THE FISHERIES

AT

PRINCE RUPERT



THE present season in common with all other lines of industry is exceeding late as far as fishing is concerned. This seems so far to apply to all lines of fishing. The herring run at the usual places where they are obtained was late and now the spring salmon is only beginning whereas in former years there have been good catches made of this variety of the commercial fish of the Pacific long before this.

The Spring salmon is known also as the King salmon and with the first catches of the season it looked as though it might well be called the "king" salmon for the price of 17 $\frac{3}{4}$ cents a pound was reached. This with the increasing amount taken has dropped down to about ten cents a pound for the best. These are the prices that were paid to the actual fisherman delivered on the wharf.

The Spring salmon affords an example of what changed conditions arising out of the war has done for various industries which promised to be most injuriously affected at the outbreak. Spring salmon is the best and largest salmon of the Pacific coast when it comes to serving fresh. Yet for years its fame has not gone beyond the coast to any extent. Even on the Pacific there were many who did not appreciate the excellent quality of the salmon. Later the mild curing of this salmon was made a very lucrative line of business and before the war broke out this fish was being so treated at all points along the coast.

The mild curing process was quite a laborious one and required very careful work on the part of the curers. The great market for this was in Germany and some other parts of Europe. Consequently the war put the industry as far as that was concerned out of the running. In many instances some of the mild curing firms were caught with supplies that made it look dismal, but new markets were found on this side of the ocean and in many cases the operators found different methods of treating with good results.

As a consequence spring salmon was never more sought after than now. The result is to be seen as far as Prince Rupert is concerned by the fitting out of every available craft that is capable of taking the fish for that work. The spring is caught in the salt water for the most part outside the rivers. They do not follow the "school" system in the run as do the other varieties. They are found for much longer seasons than the regular canning varieties of salmon.



THIS season the fish began to come about the middle of March and have been increasing since. A favorite ground for them is about North Island on the extreme northern coast of Queen Charlottes. At time of writing the fish have



not appeared there yet this season. When they do come, North Island will, as during the past few seasons since the development of the industry, become a lively centre taking the fish and shipping by larger carriers to this port.

The fresh spring salmon are growing in favor away from this coast now that the mild curing has been to such a marked extent interfered with. For a time, until they become more plentiful with the advance of the season, this is absorbing the whole catch practically, with the one exception of the light colored fish. The light colored spring salmon finds no favor with the ordinary buyer and user. As is the case in so many instances in the fish business the public are wrong in this for those accustomed to the salmon on the coast will select in most of cases the light salmon for their own use. But the whim of the general public has to be met and in consequence the price paid for the light colored springs as compared with the red is about one third.

Of late fish packers and curers are adopting a method of using the spring salmon and especially the light colored which is a delicious form for use. This is the kippering of the fish which leaves it ready for use by simply warming it.



WITH the close of the fiscal year for the Dominion statistics are available as to the records for fishing for the past twelve months. For the year ending March 31st, 1917, the halibut landed at this port has reached 19,300,000 pounds. As compared with the year previous the figures are very close. There is scarcely 200,000 pounds difference.

Of this amount the large part was landed from American fishing boats which are allowed to land their catches at Prince Rupert under the new regulations that have been in effect for over two years and which are working to the advantage of all concerned. The Fishermen are able to land their catches in better shape being fresher than if obliged to carry them all the way south to an American port. At the same time the Canadian fishermen are not interfered with as the market is such as to take care of all that is offered.

There was landed during the last fiscal year at this port by American bottoms 12,620,000 pounds. The Canadian fishing boats therefore landed only 6,680,000 pounds of the total handled through this port.

The figures showing the fish taken during the year ending March 31st, 1917, shows that the fish known as the black cod or the Alaska cod is finding favor at last. This fish has never been sought to any extent by

fishermen. What is now used may be described as a by-product of the halibut fishing. They are caught on the halibut hooks and, instead of throwing them away as was done in the earlier days of the industry on this coast, they are brought in and now used. Properly smoked and used without long delay it is a food for an Epicure. Local interests here, including the G.T.P. officials, have been doing good work in this regard by sending sample consignments and so introducing the fish to users. The results are being seen now by the steadily increasing demand for the fish.

The figures for the year that has just closed shows that nearly a million pounds of this fish was landed here. To be exact there was 944,700 pounds of this black cod landed at Prince Rupert alone. Of this quantity the American boats landed 59,500 pounds.

It is safe to promise that within a short time when the excellent qualities of the black cod are more widely known that this variety of fish will be sought in a commercial way by deep fishing for it alone. The black cod which by the way is a misnomer and not a suitable name for the fish is a frequenter of deep waters. The halibut banks do not suit him and only when the halibut banks dip over the edge of the bank are they taken.

The halibut season as represented by the deliveries at this port promise to be excellent. This is due in no small part to the fact that the number of boats that are making this their port of delivery is increasing all the time. The very high price of halibut during the winter months has induced the owners of small vessels to get every one that is at all fit for the business to be equipped for catching, and consequently the fleet has been materially increased, especially as far as small craft is concerned.

The month of April saw nearly two million and a half pounds of fish delivered here, and of this amount over two million was halibut. There was landed here 2,047,700 pounds of halibut during April. As compared with the earlier months of the year this was the highest. In January the catch landed in Prince Rupert was only 575,000 pounds. In February this dropped to 548,500 pounds. The month of March saw conditions better for fishing, and the catch of halibut went up to 1,482,300 pounds.

In the herring fishing which was done for bait for the halibut boats, March was the month that saw all this harvest gathered in. The local plant of the Canadian Fish and Cold Storage Company put up for the coming summer very nearly 2,000,000 pounds of herring.

The coming of the spring salmon has raised the figures under the head of salmon for April. There is, however, comparatively few of these as compared with other years—the season being very late. In April, the amount of salmon landed here was 51,700 pounds. This is, of course, all springs taken by trolling. These fish are caught in the open waters outside the rivers. Entering the rivers they are not caught on the hook, but have to be got by means of nets. In March the catch of this salmon was only 10,000 pounds. In February and in January there was a catch of only 500 pounds each month.

The cod fishing is showing an increase, due in part to the general increase in the halibut fishing when black cod are obtained, and also because of the use of the trawling adopted by the Canadian Fish and Cold Storage Company. The trawling operations have proved an evident success, and there are now a number of

small craft getting ready to enter that line of business. These will depend upon the market found nearby in the cities on the coast farther south. The cod brought in last month represented 125,000 pounds. In January the catch was 28,600 pounds; February, 41,000 pounds; and March 60,900 pounds.

The trawling operations has brought onto the market here another variety of fish that hitherto was only found in very small quantities. This is the sole, which is obtained in many varieties, and with it may be classified various other flat fish that differ only in quality from the real sole. The lemon sole that is obtained by the trawl here is pronounced to be the equal of that taken for the British market. The catch of soles for April was 182,300 pounds. In January there were 5,333 pounds taken. In February the catch locally was 102,600 pounds, and in March there were 129,600 pounds.

The Canadian Fish and Cold Storage Company, which is so very prominent a feature of the fishing industry in the city of Prince Rupert, has now transferred its head office to this city. Formerly it was in Vancouver, where for business reasons in the very early days of its formation as a company, and before the plant was built here, and the facilities for rail shipping were established out of Prince Rupert by the construction of the G. T. P., the southern city was made the head office. For a long time this has been the real headquarters, although the head office remained nominally in Vancouver. Now a formal transfer of the registered office of the company has been made to Prince Rupert.

The Canadian Fish and Cold Storage Company has purchased its first American fishing bottom. The schooner Sitka, formerly owned in Seattle by a syndicate of which the skipper, Capt. J. Johannsen was the chief, has been bought by the company. She is to be operated as an American vessel in the halibut trade as formerly, and will be under the command of Capt. L. J. Reed, of Seattle. She is capable of carrying about 90,000 pounds of halibut, and is fitted up with auxiliary power. She will in future bring her catches to Prince Rupert, delivering them direct to the owners at the cold storage.

A number of the companies operating in the halibut trade have owned both Canadian and American boats. This is the initial step by the Canadian Fish and Cold Storage Company in this line. It is not announced yet whether the Company is in the market for any additional American schooners or not.

Under the arrangements between the Customs Departments of the two countries the catches of the Canadian boats can be shipped to either Canadian or American markets, going in duty free to the United States. The American boats, while being allowed to land their catches in port here in common with other Canadian ports, must ship the catch in bond to the United States.

Pacific Steamer Sold for Maritime Trawler.

The Wallace Fisheries Limited, have sold their Steamer "Orontes" to Messrs. A. & R. Loggie of Loggieville, N.S., for an unstated sum. The new owners sent Captain Reynolds and a crew of eight men to Vancouver to take the boat through the Panama Canal to Halifax. It is their intention to procure a complete trawling outfit from Denmark and equip the boat as a beam trawler. The boat was dry-docked and given a complete overhaul before being turned over to her new owners.

Who's Who in the Fishing World

A. L. HAGER.

An Appreciation.



IN the opinion of the men in the fishing industry on the British Columbia coast, the man who put the H in halibut is Mr. A. L. Hager of Vancouver, general manager of the New England Fish Co. and the Canadian Fishing Company, Limited, with ten steamers on the Pacific and an army of employees, peacefully producing fish for food for the peoples of the North American continent.

At the moment, and for the purposes of this article, he is in the public eye, one might almost say the Fish-eye, by reason of the fact that he has been chosen with one accord by his confreres in Vancouver as the chairman of the newly created branch of the Canadian Fisheries Association of that city, which came into being on April 4, when representative men engaged in a large way in the fishing industry in B.C. met in the council rooms of the Board of Trade and decided to link up the province of British Columbia with the rest of Canada in one organization, devoted to the fishing interests of the country from the Atlantic to the Pacific.

Mr. Hager comes naturally to his present position, for, from the very inception of the Canadian Fisheries Association, he has been a member of the parent organization and has served as a member of the executive representing B.C. In fact, wherever fishery matters are under discussion in a national way and whenever a movement for dealing with fishery problems with a broad and generous hand is to the fore, there you will find him giving his energy and help. This is because to him the fisheries of Canada are of great importance and worthy of the support of public-spirited citizens.

Perhaps no other man in Canada connected with the fishing industry is better known on this continent than Mr. Hager. For more than fifteen years he has been the personality behind the companies he represents in B.C. and he has so stamped his personality upon his business in all its ramifications, that to-day the name Hager is synonymous with the New England Fish Co. and Canadian Fishing Co. not to say with the fishing industry of B.C. And this has been accomplished not by advertising but by strictly attending to business and letting the results in increased trade and progressive extensions proclaim the fact. He thinks in terms of his companies. He is an emanation from them, possesses their spirit, that wide vision and a great part of their untiring activity.



IT is not too expansive a phrase to use to say that he is the greatest fish man in Canada to-day and this statement will be accepted without disparagement of many other prominent and influential members of the fishing fraternity, who would be the first to hail him foremost if they were asked to give an opinion. While others may be his peers in producing fresh fish from the Pacific yet it will be freely admitted that he alone combines with the producing features of his business, other units, such as cold storage, smoking and curing on a large scale, to make a huge composite fish producing business, to which is attached the most extensive and efficient distributing agency the industry so far has

created in America. Credit for the success of the New England Fish Company and the Canadian Fishing Company, is due no doubt in part to the organizing skill of the eastern directors who are all men of large affairs but in the final analysis, the bouyant, bubbling, business-getting personality of Mr. Hager as it shows itself in B.C. is the predominating factor of their continuous progress and pronounced achievements. That is why, in the public mind in B.C., fish is forever associated with Mr. Hager and how halibut got its H.

But it is not alone for the business side of his activities that he is so widely and appreciately known in B.C., but also for his ready participation in the community life of the province, for he is a man who sees life as a whole and sees it clear. He fits in, and thinks that he has duties as a citizen to perform, and he performs them with as much pleasure and energy as he transacts his business. He is the friend of all worthy causes. The members of the Lost Legion never get the cold shoulder from him. He is human and for his own good, perhaps, wears his heart too close to his sleeve.

In the practice of the much-neglected virtue of hospitality, he is in his element; he is a veritable prince. He possesses ease of manner, himself, and knows how to put his guests at ease, even if the surroundings be new and at times embarrassing. He delights to lunch with half a dozen friends and while catering to the inner man, to exhibit an optimistic outlook on life, that makes one forget for the time that one has to work for one's daily bread.

He has a temperament that nothing can dampen. When less than a year ago fire destroyed his plan one Sunday night, burning his office and wiping out his records, he was at work on Monday morning in a make-shift office in the smoke-house, as if a fire was a matter of no concern. And so well had he his business in hand that every order was filled and not a customer in the city or outside of it, was put to a moment's inconvenience. Whatever comes to him in the way of business is part of the game and is met with a spirit that will not be daunted. He believes in himself and that is half of any battle.



WHEN Canada issued her 1st war loan Mr. Hager was among the first Vancouver business men to subscribe for \$25,000. It was so with the other issues, till to-day his company has \$100,000 in the Canadian war loans. He has many returned soldiers employed in his factory, and his firm is listed as one of others in B.C. that have pledged themselves to give the returned soldier the first call whenever a vacancy occurs. It is a rule of this company that only white men need apply for positions with it.

In athletic circles, he is among friends, and supports all amateur endeavors. He is a bowler of repute. He owns two or three automobiles, one at least of ancient vintage but kept in condition through affection as one might take care of a faithful dog. He acts as his own chauffeur, and his special stunt of backing out along the Gore Avenue wharf is a trick that tests the loyalty of his friends. But after all, he really prides himself only on his ability to sink the pink 'un in a game of snooker, for which pastime he has the most ornate billiard table in B.C. installed in his house.

His attitude of mind is cosmopolitan. He has travelled east, and also west and even has been known to

tread the hot sands, to which the mystic pin on the lapel of his coat testifies. He is widely read in the thoughtful literature of the day and can discuss Imperial politics and the intervention of the U.S. in the war with the grasp and certain judgment with which he will buy or sell a million pounds of halibut. When a man considers that the Literary Digest and the Geographical Magazine are necessities of life, some idea of his calibre may be formed. He is versed in fishing conditions the world over and speaks with authority born of accurate information. In the sense in which Bacon used the word when he spoke of reading making the full man, Mr. Hager is a full man.

To his close friends he shines best at his own fire-side, where he relaxes amid the affection of those nearest and dearest to him. He is an ideal father and husband, and unbends as only a man, still a boy at heart, can. He has a beautiful home on Shaughnessy Heights, Vancouver, and is now making it even more beautiful by the studied planting of trees and shrubs and picturesque landscape gardening, into which he enters with great zest. With care and luck he will have his place blossoming with roses and flowering trees this summer. It is characteristic that he will have effected a transformation in six months time, transplanting trees full-grown and bushes loaded with buds. Far countries have been searched in order that he might make a spot in Vancouver more beautiful to be seen.

In a word, Mr. Hager is a fine citizen and the electricity in the fishing industry in B.C.

EVJNRUDE MOTOR AGENCIES IN CANADA.

Distributors for the Evinrude Detachable Rowboat and Canoe Motors have been appointed as follows: Maritime Provinces, A. R. Williams Machinery Co. of St. John, N.B., Ltd., St. John. The Saskatchewan Motor Company, Limited, of Regina, and Revillion Wholesale, Limited, Edmonton.

These concerns will handle all agency appointments in their territories, and will carry a full stock of motors, parts, and accessories.

Since January first the following distributors have represented the Evinrude in Canada: A. R. Williams Machinery Co., Limited, Toronto, Province of Ontario; E. Drolet, Montreal, Eastern Quebec; Capt. A. A. Sears, Victoria, Province of British Columbia.

The sale of the Evinrude has been affected by the general prosperity obtaining now in Canada, and sales to date have already passed last season's mark.

OFFICIAL MEASUREMENTS OF STANDARD CANS.

Sanitary Cans:	Diameter.	Height.
No. 1 size	2 11-16	4
No. 2	3 7-16	4 9-16
No. 2½	4 1-16	4¾
No. 3, 4⅞-in.	4¼	4⅞
No. 3, 5-in.	4¼	5-in.
No. 3, 5½-in.	4¼	5½-in.
No. 10	6 3-16	7
Hole and Cap Cans:		
No. 1 size	2 11-16	4
No. 2	3¾	4 9-16
No. 2½	4	4¾
No. 3, 4⅞-in.	4 3-16	4⅞
No. 3, 5-in.	4¼	5-in.
No. 3, 5½-in.	4¼	5½-in.
No. 10	6¼	6¾

MR. SAMUEL BARBOUR, NOW PRESIDENT OF JOHN LECKIE COMPANY

Mr. Samuel Barbour, whose photograph we herewith reproduce, and who for some time past has been manager of John Leckie, Limited, the well-known fishermen's supply house of Toronto, has recently been appointed President of this



Samuel Barbour.

Company, succeeding the late Col. William Barbour, an account of whose sudden death was published in the last issue of this paper. The Canadian Fisherman, in conjunction with Mr. Barbour's many friends throughout the country, extend hearty congratulation to him on his well earned and well merited appointment.

NO MORE DUTCH FISH FOR HUNS.

Special despatches from Holland say that the persistent torpedoing of Dutch trawlers has caused the fishermen to lay up their boats. The trawlers were guaranteed safety within prescribed limits, and a supply of German coal on condition that they supply fish for the German market. The promise was not kept, and the sinkings continued, so the German legation at The Hague is said to have been notified that no more fish will be supplied.



Fish-Cultural Notes

No. 3.—“Salmon Problems.”
 By J. B. FEILDING, F.Z.S.,
 Late President British Fish Breeders’
 Association.



THE Atlantic Salmon—*Salmo Salar*—has from time immemorial been termed the “King of Fish,” but has never received that respect which is due to a king. No fish has been written about or legislated for more than the Atlantic salmon—the only true salmon.

Any waters frequented by the salmon are closely and jealously watched by the angler and netsman and every known means both legal, and I am sorry to say, illegal is employed in getting it out of the water. It is not surprising then that from early history the Crown has had to regulate the catching of this fish or it would have long since been only exhibited in museums as part of our extinct fauna.

The Crown has always had great difficulty in framing legislation for the protection of this fish, for until quite recent years little knowledge of its life history has been known. Much credit is due to Mr. Caldwell, Inspector of Scottish Salmon Fisheries; Sir Herbert Maxwell, Mr. H. Johnston and others, for their untiring research.

Up to quite recent times the life history of the salmon has been an accumulation of erroneous theories linked up with very few facts.

This has undoubtedly been due to the fact that the fish is anadromous in habit; that is it spends the greater part of its life at sea, but has of necessity to return to fresh water to reproduce its species.

However, notwithstanding this dearth of knowledge, legislators have bravely framed laws from time to time in the attempt to protect this valuable fish.

In 1424, in James I. reign, this Scottish monarch approved a bill during his first parliament to protect the salmon in Scotland in a somewhat drastic way, for a section of it read as follows: “Quha so ever be convict of slaughter of salmonde in time forbidden be the law he sall pay fourtie shillings for the unlaw and at the third time gif he be convict of sik trespass he sall tyne his life or then bye it.” Those good Scottish people, were not going to have the king of fish roughly handled and further they realized the necessity of impressing on all men the fact that migratory fish at any rate were practically the property of the Crown until such time as they entered on waters flowing over land held in “fee simple.”

Fishery legislation up to the present time has for the most part aimed to prevent man being unduly greedy and much of it I fear has been based on erroneous data if on any data at all.

Though we have progressed in our knowledge of the life history of the salmon legislation has not kept pace with our recent discoveries.

We know now what we did not know 60 or 70 years ago that the salmon passes through certain well defined stages, namely:

1. The ovum or egg which is deposited in the fall and hatched in the late winter or early spring.

2. The “alevin” or embryo with its yolk sac still attached.
3. “Parr” or fry defined as bearing the parr marks or vertical bars on the sides.
4. “Smolt” defined as having assumed the well known “silvery dress” previous to descending stream.
5. “Grilse” or mature fish returning to fresh water the first time after, approximately, twelve months at sea.
6. “Spring fish” a fish that has passed the grilse period at sea and therefore has spent about twenty-two months at sea.
7. “Salmon” the adult fish that has spawned before.



PERHAPS it would not be superfluous were I to touch briefly on each of these periods so that we may fully appreciate the conditions most favorable to each stage in the salmon’s life history so far as we have to deal with it in fresh or river water.

In discussing the true Atlantic salmon I do not want my remarks to be considered as being applicable to the “Landlocked” type, though zoologically speaking it is the same fish. By the latter I mean the so-called “Ouananiche” or Sebago salmon common to Lake St. John, Lake Sebago and many other lakes in the Maritime Provinces and Maine.

First let us consider the ovum or egg of the salmon. It is deposited in the late fall before the freeze-up and usually in water just deep enough to cover the fish while depositing its ova. The site selected is invariably a clean gravel bed of such a nature that the ova can roll down into the crevices for protection.

The female prepares her “redd” (Norwegian for nest and always applied to salmon egg laying grounds) by slow movement of her tail. This has in my opinion three objects, first the cleaning of all possible vegetable matter which might promote disease affecting the ova, secondly to loosen up the ova in the ova sacs and thus facilitate the free passage of them, and thirdly to level out a suitable bed on which the ova can lie where they can be properly impregnated by the male fish. The male is generally waiting behind the female until such time as she is ready and finished performing her duties.

The male watches her every movement and wards off all intruders by vicious attacks, be they of his own species or any of the predatory creatures that hover about spawning redds.

Now modern conditions have tended to create artificial surroundings in many of our rivers so that the salmon cannot obtain sufficient suitable spawning ground.

These conditions are of two classes, mechanical pollution and obstruction.

The former may be composed of sawdust, or bark resulting from log "driving," sewerage sludge and other decomposing organic matter. Any of these materials covering what was once good clean gravel would prevent any "gravid" salmon frequenting the area. There must be no foreign matter at all if salmon are to make use of a gravel bed. Hence we must keep our rivers as clean as possible and free from industrial and municipal effluents as I believe the law directs.

By obstructions I mean dams, weirs and water falls. It is said by many students of economic zoology that more ova is wasted by overcrowded spawning redds than by any other means and nothing promotes a crowded redd more than such an obstruction to the free upward migration of the salmon.

Picture what happens. A few female fish come up as far as they can, followed, of course, by such males as are "ripe" and being in close quarters the latter commence to fight. This continues until the first batch of females have completed their spawning while the now hungry males commence to rout up the redds and devour all ova in sight.

These now "ruddy" males wait about for other females to come up and as fast as ova is deposited so fast do these pent up male fish devour all in sight. This is no exaggeration, anyone who watches an obstruction, be it natural or artificial on a river, will observe this struggle for breeding space of migratory fish.

Now, how can this dreadful state of affairs be got over? The answer is obvious, either prevent gravid fish entering such a river or assist them over the obstruction.

The former is well-nigh impracticable so that the latter is essential.

We now come to the means of attaining this object. Much has been written about salmon passes, ladders, slides and elevators, but few practical schemes have been devised.

The principle faults in the engineering of what I prefer to call a "Salmon Pass" originate in the fact that they have for the most part been designed by engineers with no knowledge of fish life and in particular the conditions essential to the upward migration of a gravid female fish.



THE fundamental principle underlying the designing of a Pass, no matter what height, cannot be better explained than it was to me years ago by a Highland Scottish gillie:

"Na fush wi' eggs ul jump if she may crawl and na fush in such a condition can crawl except through black water." In other words what is meant by this is that a fish heavy in eggs cannot be expected to do any successful jumping and deposit eggs that can be perfectly impregnated and further she cannot penetrate super-aerated water since there is not sufficient resistance for the caudal fin in order to propel her forward.

I have always found that the following rules if followed out produce a successful salmon pass:

1. Design a pass that will enable a fish to travel with the minimum of water.
2. The pass should operate at all stages of water volume passing down the river.
3. It should be constructed in such a way that it will not be blocked with ice coming down the river.

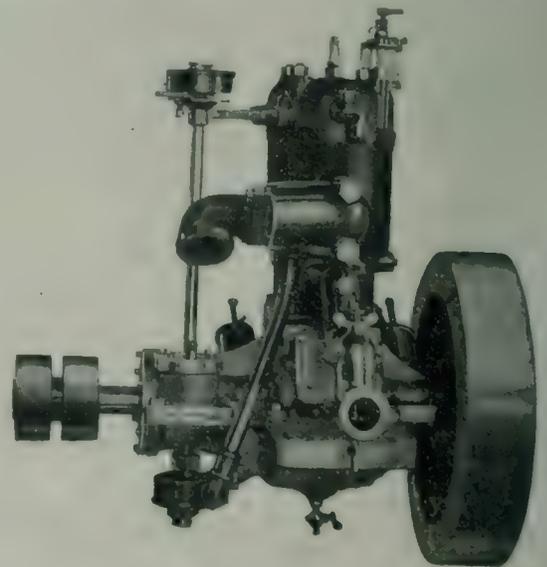
4. A gradient of not more than 1 in 9 to 12 should be provided for.
5. There must be a minimum of aerated water in the pass.
6. At each rise of 9 inches there should be devised a means by which the fish may rest in still water and also admit of the water being liberated of its aeration before passing on.
7. The downstream entrance must always be located at a spot where fish naturally congregate before attempting the obstacle.
8. Sufficient water must be allowed down the pass to attract fish to the base, otherwise they may fail to find it.

With these principles in mind it is a simple matter to construct a pass that will be used throughout the whole season by fish moving up and down stream.

I have heard, as have many of your readers, that some great fishery authorities have spent great sums on erecting salmon passes and have turned all down as failures eventually and when you come to examine the reason of failure you are sure to find some fundamental principle has been forgotten.

THE "BROWN" FISHERMAN'S ENGINE.

The accompanying illustration shows one of the fishermen's marine engines, manufactured by the Brown Engineering Corporation, Limited, Toronto, whose announcement appears in another column. This is a 7½ horse power cylinder engine of about 260 pounds' weight, which operates on either gasolene or coal oil, and sells complete with sight feed oilers, grease cups and carburetors, f.o.b., Toronto, for



\$98.25, a price which puts it within the reach of every fisherman throughout the country. Every engine manufactured by this concern carries with it a five-year guarantee, and as they have been manufactured in Toronto for over eleven years, hundreds of fishermen throughout the country can testify as to their durability and effectiveness. Full particulars will be gladly supplied by the Company on request.

Newfoundland Enters Fish Industry on Large Scale

Following the visit of Major Hugh A. Green, Director of Canadian Fish Supplies, to Newfoundland last fall, where he met prominent members of the fishing industry there, and told them of the possibilities in fresh fish, an interesting project, destined to revolutionize the Island's fishing industry, has been started. A full account of the initial operations are given herewith from the St. John's Trade Review:

The Reid-Newfoundland Company began work last Monday on the erection of a Cold Storage Plant for fish at their premises near the Railway Station. The building will be of concrete, 200 x 90 feet, and three storeys high. It will have a cold storage capacity of ten million pounds of fish. All fish fit to eat will be handled there, as well as codfish, and cash will be paid to the fishermen immediately on delivery. In the case of codfish all the fishermen will need to do after catching it is to take out the entrails. There will be no splitting and no salting.

It is the intention to have receiving branches in different parts of the Island, six for a start, one at Port-aux-Basques, one at Bonavista, one at Lewisport, one at Placentia, probably one each at Bay-de-Verde and Trepassey. The market will be on both sides of the Atlantic, and liners with cold storage will take the fish from St. John's after being brought in from the outports on cold storage trains. The Bay steamers will be equipped with cold storage plants in conveying the fish from the outport centres.

The outport plants will have a capacity of five million pounds of fish, and exporting will be done direct to Canada from the depot at Port-aux-Basques. Motor boats will be used to collect the fish in the bays and bring it too the storage centres. It is also contemplated to have a plant at some convenient port on Labrador.

Mr. Cowan, the Cold Storage expert, who is here from Scotland, initiating the work, says that fish can be kept two years by his process and be as good as when it came from the water.

The demand for fresh fish has been brought about by necessity. The beef supply of the world has been practically destroyed by the war demand for meat rations and leather. It will take ten years at least for its recovery to anything like the normal standard; meantime the people must have food and fish is the best substitute, in fact, food analysts say that good fresh codfish is by no means inferior to beef, pound for pound, in nutritive qualities.

The next question, as far as the trade of Newfoundland is concerned, is: What will be the effect on the dry codfish export; will that business be killed out? We do not think so. Where we get a million and a half quintals now in an average year the new conditions ought to enable our fishermen to increase the year's catch fifty per cent. They will be relieved from splitting, salting, and the many hours spent in drying. This time will be spent on the fishing ground. Competition will drive up the price of both kinds of fish, and the lessening of the catch of dry-cured will enhance its price in the foreign markets, and we shall hear no more of periodic congestion that so often in the past has resulted in slumping the prices abroad.

A feature in favor of the cold storage system that may be kept in mind is that the Company will not confine all its energies to codfish, but will utilize all the fishes in our waters that are fit to eat, including herring, salmon, lobsters, plaice, caplin, perch, etc., most of which are now either only half developed industries or ones entirely neglected. The new company is capitalized at \$2,000,000, and will be called Newfoundland Cold Storage Fresh Fish Corporation, Ltd., with headquarters at St. John's Newfoundland.

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MANITOBA NOTES.

(Special Correspondence).

For some years it has been rumoured that the big fishing interests, of Chicago, were indirectly connected with some of our largest producing sections in the West, but the reports were generally denied by those who ought to have known the facts, and who doubtless did know all about them. Some days ago rumor went to the winds entirely and we learn from the advertising columns of the Winnipeg papers that the Booth Fisheries Co. of Canada have decided to make great changes in their western arrangements.

The re-arrangement applies only to the interests of the Armstrong Trading Company, formerly at Portage La Prairie, but whose head office has been moved to the premises of the Winnipeg Fish Co. in Winnipeg.

In future the operation of the Armstrong Trading Company will be divided into several districts under resident managers and the following appointments have been made: Le Pas district Mr. H. S. Johnson, manager; Winnipegosis district, Mr. J. P. Grenon, manager; Warroad, Minn., district, Mr. Paul Marschaek, manager; Kenora district, Capt. A. J. Johnson, manager, all of whom will come under the jurisdiction of the Winnipeg office.

The Hon. Hugh Armstrong, who is one of the directors of the Canadian Fisheries Association for Manitoba, will be the western representative of the Booth Fisheries Company of Canada, Limited, with headquarters in his home town—Portage La Prairie.

The fishing town of Selkirk is actively preparing for the Lake Winnipeg fishing season which should open June 1st, but the lake is still ice bound and it is certain operations will be delayed this year.

The Northern Fish Company are overhauling the S.S. Wolverine prior to taking up her usual sailing schedule and the same company are completing an additional tug for their lake fleet.

The North-West Navigation Co. and other parties are getting their boats and gear overhauled also.

In common with the other parts of the continent this district is being hit with the H. C. of L. bug and it is admitted that higher prices will prevail this summer for all varieties of lake fish.

The Fish Companies in Winnipeg are extending their motive delivery services somewhat. The W. J. Guesh Fish Co., Limited, have recently purchased a Reo delivery truck, which with their Detroit electric truck, will enable the Pioneer Company of the west to extend their service which is one of the strong claims in the programme of the guest concern.

Mr. W. R. Spooner spent a day or two in Winnipeg enroute to the Pacific Coast. "Bill" seems to have quite a strong love for the West and if his annual trip is a criterion of this, he is consistent to a degree. We look for "Bill" every year now and hope to see more of his Eastern messmates in the West this summer.

Mr. J. J. Harpell, of Montreal, was in Winnipeg recently and an endeavor was made to form a local branch of the Canadian Fisheries Association, but it was impossible to have a meeting, fully representative of the industry in Manitoba, consequently the matter was delayed until later in the summer when an attempt will be made towards this desirable end.

Many of the dealers in the province have a grudge against the continuance of the 1/3 rebate off the Pacific Coast Express rates and rightly so. This subsidy

actually works a hardship on the fish produced locally as well as the fish adventurers in the fish business, port. The fact that adventurers in the fish business, who have nothing at stake, have no business premises to keep up, no business tax to pay come into the country and get the advantage of a low express rate, by reason of the subsidy from the Pacific Coast, is surely an injustice to those men whose all is invested in Cold Storage plants, fishing fleets, expenses warehouses, etc.

Moreover, we produce fish ourselves in this Province and when a man in the country can transport fish from Vancouver or Prince Rupert at an express rate as low and in some cases lower than our own local production costs in express charges, then this discrimination ought to be discontinued.

The fish business is not a railroad company and the men in it ought to be independent enough to say, we can stand on our own legs, we want no favors, we can develop what is here, without any strings to the bow.

MARITIME FISH CORPORATION ACTIVITY.

(Special Correspondence).



ALIVE to the necessities of the times, and eager to meet the demands of an active market, the Maritime Fish Corporation have recently made additions to their fishing fleet, which they firmly believe will provide them with a more regular and increased supply of fish.

Some few weeks ago, the Schooners "Albert J. Lutz" and "Dorothy G. Snow"—vessels that had been attached to the Digby fleet, were sold for the Pacific trade, and after sailing to Halifax were fitted with auxilliary power; and it was no easy task to replace these with other schooners equally capable.

The Maritime Fish Corporation decided to charter two steam trawlers for their trade, and negotiated at Boston for the "swell" for Digby, and the "tide" for Canso.

The "Swell", which flies the American flag, has also an American Captain, Mate and Engineer, but the deck hands are all Nova Scotians, and shipped for the initial trip from Yarmouth last Friday.

She steamed for the Western Bank, and in two day's fishing secured her load of 150,000 lbs. chiefly had-dock. The gale of Wednesday caused her to "lay to" for twenty-four hours, yet she arrived in Digby on Friday, and at once proceeded to discharge her catch.

The "Dorothy M. Smart", Capt. Ansel Snow, arrived on Tuesday last with 92,000 lbs. of mixed fish, and after discharging made preparations for putting to sea again.

The "Tide" is a much larger trawler than the "Swell" and has a capacity of 250,000 lbs.; she operates at Canso, and brought in her first catch on Tuesday last.

In addition to this vessel the Corporation has its own trawler "Rayandor", an up-to-date Grimsby craft, with a capacity of 300,000 lbs. which is working in connection with the Canso branch regularly.

The outlook for future supply is very encouraging, and in a chat with H. B. Short, President of the Corporation, we learned that present prices were very slightly above the normal, being a little more than those obtaining this time last year. If people would only be content to take the fish in season, he did not see any necessity for very high prices. The demand for fish is consistently good and is likely to remain so.



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ALBERTA BRANCH OF THE CANADIAN FISHERIES ASSOCIATION FORMED

On a recent visit to Eastern Canada, Mr. A. S. Duclos, of the Edmonton Cold Storage, came in contact with, and was very much impressed by the good work which the Canadian Fisheries Association was doing, and decided that its influence should be extended to the Fishing Industry of the Province of Alberta. On his return to Edmonton, he arranged for a meeting of local interests. The meeting was held in the afternoon of April 24th, at the office of the Edmonton Cold Storage. There were present:

F. H. Miller (generally known throughout the north country as "Dad" Miller).

W. C. Campbell, of the Alberta Fish Company.

W. H. Wallace, of Menzie & Company.

F. W. Miles, of the Northern Fish Company.

R. B. Hunter, of the Swift Canadian Company.

C. B. Stewart, of P. Burns & Company.

A. S. Duclos, of the Edmonton Cold Storage.

J. H. Lyon.

J. J. Harpell, of Montreal, who was on his way back from the Pacific Coast, was invited to be present and explain the organization and work of the Canadian Fisheries Association.

Mr. Duclos opened the meeting and outlined the several matters which should have immediate attention if the fish resources of Alberta were to be kept up by re-stocking and propagation to the point where the Province would have a continual resource with a maximum annual catch. He felt that the Canadian Fisheries Association was well designed to bring about this result, and strongly urged the establishment of a branch in the Province of Alberta, with headquarters at Edmonton.

Mr. Harpell gave an account of the workings of the Association, and the procedure necessary for the establishment of a branch at Edmonton. After a considerable discussion, in which all present took part, a branch was duly established with the following executive, which it was understood would hold office, and arrange for the first general meeting, that in all likelihood would be held at Edmonton some time during the coming autumn:

Mr. F. H. Miller, Chairman,

Mr. J. H. Lyons, Secretary,

Messrs. W. Menzie and W. C. Campbell, as representatives of the fishermen of Lesser Slave Lake.

Messrs. F. W. Miles and Clark, representing the fishermen of Lake La Biche.

Mr. E. Cressey, representing the fishermen of Lake Wabamun.

Messrs. R. B. Hunter and C. G. Stewart, representing the trade.

It was understood that this Executive would continue to look after the affairs of the branch as pro tem officers, and each would make a special effort to see that as large an attendance as possible from the districts represented would be present at the general meeting to be held in the autumn.

It was explained that membership in the Canadian Fisheries Association was open to anyone who was connected in any way with the production, preparation or distribution of fish, and all such in the Province of Alberta would be earnestly solicited to become members of the Alberta Branch of the Canadian Fisheries Association.

THE CANNING OF HERRING.

Replying to an enquiry by a Prince Edward Island subscriber, Mr. J. F. Calder, Inspector of Fisheries, Campobello, N.B., states:—

You do not state the kind of herring which is contemplated being canned, but from what I know of conditions at Prince Edward Island, I conclude that it is large herring.

The best size of can for large herring is a one pound tall. The packed fish are better in cans that are lined.

The heads and tails should be cut of the herring and entrails taken out. They should be cut the full length of the can, and the can should be crowded full of fish, as they shrink very much in the bathing process. The fish should be salted for at least 24 hours in strong pickle. It is not necessary to put either salt or pickle in the cans.

With regard to the bathing process, which of course is for sterilization purposes, the retort process is much better than the old style water bath. The best processing for large herring is to retort the cans for about one half hour before the covers are put on them; then put the covers on while the cans are still hot, and retort them for one hour with 10 pounds of pressure, which is equivalent to 240 degrees of heat. If you have the water bath only, large herring should have three runs on three successive days. Each run should be about an hour and a half, and the cans should be opened and stopped each time.

A barrel of herring will make about three cases, each containing 48 one-pound cans; therefore, if all other costs amount to \$5.30 per case, as you state, the total cost per case, including the cost for fish, would be about \$5.75, which is about 12c. per can.

The labels can be procured from most any lithographing concern.

From my knowledge of the business and also of the run of large spawn herring which frequent the Gulf of St. Lawrence and Northumberland Straits in the spring of the year, I have grave doubts as to the advisability of packing such fish. They are both too large and too poor to make a first class article. Spring fish contain a much larger percentage of water than the summer and fall runs do; water boils out in the bath and leaves the cans only partially filled with fish. The run of summer herring caught in nets of about 2 inch mesh, would make excellent goods if properly packed.

Of course the cheapest and best method to pack these fish would be to procure sanitary cans, automatic closing machines and retort baths. To use open top cans which must be soldered by hand is an unsatisfactory, slow and expensive way. A soldering "plug" which is used on cans that have the covers snapped on the cans is much better than hand soldering. Messrs. Burnham & Morrill, I believe, use such heading and soldering arrangements in their lobster canneries.

When I was last in the sardine business, about twelve years ago, I packed a considerable quantity of herring in round cans, and used the Burnham and Morrill outfit, it was the best scheme available in those days, but does not compare in any respect with the automatic closing machines now in use.

Mr. W. R. Spooner, of the National Fish Company, of Montreal and Halifax, is making his annual trip to the Pacific Coast. He is at present in Vancouver, and will visit Seattle and Victoria before returning.

Vol. 4, No. 6, June 1917

THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV

MONTREAL, JUNE, 1917

No. 6

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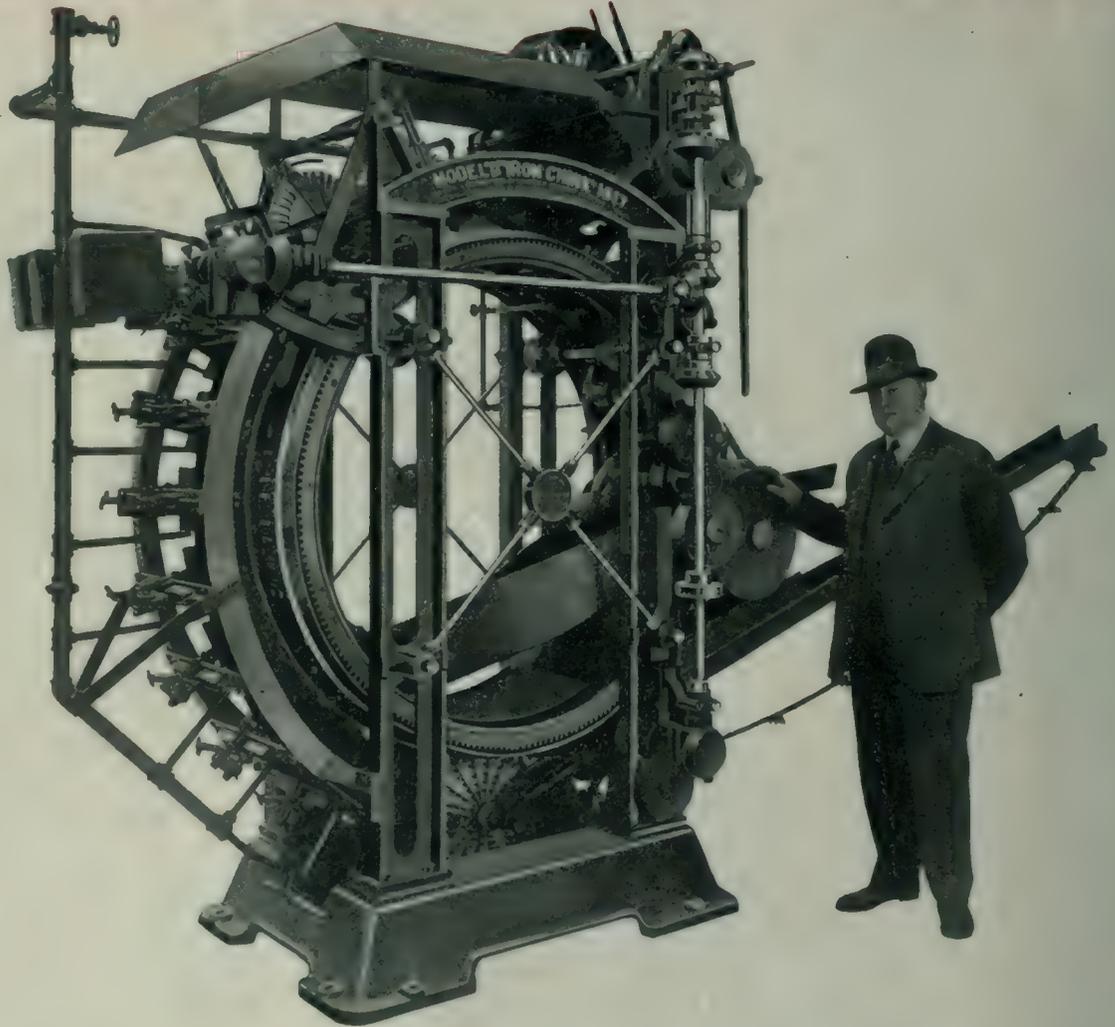
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OF CANADA AND NEWFOUNDLAND
THE SCIENCE OF THE FISH CULTURE
AND THE USE AND VALUE
- OF FISH PRODUCTS -

F. WILLIAM WALLACE

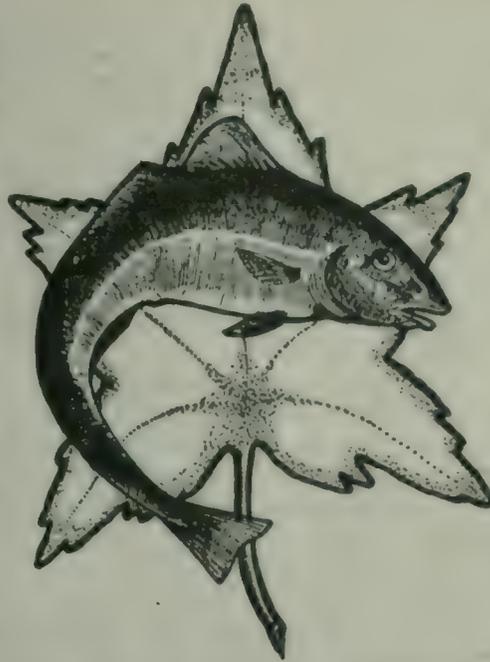
EDITOR

The Industrial & Educational
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CANADA

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Published on the 24th day of each month. Changes of advertisements should be in the publisher's hands ten days before that date. Cuts should be sent by mail, not by express. Readers are cordially invited to send to the Editor items of Fishery news, also articles on subjects of practical interest. If suitable for publication these will be paid for at our regular rates.

Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, JUNE, 1917

No. 6

ONTARIO'S FISH CAMPAIGN.

The Organization of Resources Commission of the Province of Ontario, through a special sub-committee, are planning to inaugurate a campaign to encourage the use of Ontario fish among the Ontario people. A cook book showing how whitefish, herring, trout, pike, pickerel, bass, etc., should be cooked, is being compiled and will be distributed throughout the province; the value of fish as a food will be advertised, and dealers will be encouraged to push their sales of Ontario fish. Means are being considered whereby the fishermen will be enabled to increase their production of fish to take care of the demand.

Though this campaign is confined solely to the Province of Ontario, and is for the purpose of increasing the consumption of Ontario lake and river fish among the residents of the province, yet we commend it heartily and believe it is a step in the right direction. The idea is so good that it should be universal and we would strongly advocate similar work being done by the other Provincial Governments.

British Columbia and Nova Scotia are the greatest fish producing provinces in the Dominion. There is an opportunity for both Governments to advertise their fish products and form a Commission for the purpose, not alone in preaching the gospel of "Eat fish and more of it," in their particular province, but throughout the Dominion. The other provinces can take their cue as well and start a campaign along the same lines.

The Canadian Fisheries Association's scheme of a Tuesday fish day can be very well embodied in these campaigns.

ERASING THE BORDER LINE.

The entrance of the United States into the war arena on the side of the Allies has given rise to a feeling in Canada of gratefulness at the recognition of the justice of our cause by the world's greatest republic.

Yet another feeling has arisen, and that is a desire on our part to effect an amicable adjustment of the fishery disputes which have arisen in the past between Canada and the United States. When nations are fighting side by side, pooling their resources and gold, it is only logical that petty discriminations and trade barriers should be done away with and relaxed if it is at all possible to do so without permanent injury to one or the other.

Ottawa and Washington, are, we hear, getting together on outstanding fishery questions, and the changes will be far reaching. The Canadian Modus Vivendi will probably be abolished, and it is probable that the United States regulation forbidding Canadian fishing vessels to clear from American ports direct to the fishing grounds will be rescinded also.

There are other matters affecting the Lake and Pacific fisheries which will come under discussion, and with the new spirit of fair play animating both countries, there will be enacted legislation beneficial to the fishing industries of both countries.

WHAT THE HUNS ARE DOING TO BRITISH FISHERMEN.

Fishermen of Canada! Just read here what the gentle Hun is doing to our brother fishermen across the Atlantic. The story is from the most reliable and authentic sources:

A trawler, of the ordinary steam-fishing type, was on her ground fishing, when a German sub. opened fire at about 3,000 yards, using shrapnel and small calibre high-explosives. The crew of the trawler commenced to abandon her, and take to their boats, though a heavy sea was running, and they were more than 70 miles from land. The submarine continued her shelling, even at the boats in the water, and as she gradually closed up the fire became more intense and deadly. The skipper was killed as he stood at the wheel in the wheel-house; another shell carried away the funnel and put the steering gear out of order, while a shrapnel shell burst on deck, killing four more men. The submarine then made off, while the survivors in

the boats made towards land, and reported to a patrol ship. The patrol ship went out, and found the trawler still floating, and towed her in to safety. I saw her coming in, and went down to the wharf. There were the poor fellows' bodies, partly covered with their own nets; and the sight of those mangled bodies and the ship's scuppers dripping with human blood, was terrible in the extreme."

"It is my daily lot now to come in direct contact with these things; and I can assure you there is no exaggeration in anything you are likely to hear about these damnable Huns. They have taken our men prisoners, and put them at the periscope, to act as informers, under peril of death for refusal to betray us to them.

They have dived with our men standing on deck, leaving them to struggle or to drown. . . . So you know all the awful sacrifices we are making are not in vain if we successfully liberate the world from a periodic recurrence of such warfare, accompanied by such monstrosities of crime."

Fish As Food in England.

COLIN McKAY,

H. M. Transport "St. George," Southampton, Eng.

Now that the British Government is seriously tackling the problem of regulating the prices of foodstuffs and rationing the people, it is interesting to recall that similar action has been taken at more than one period in the checkered history of England. In the times of the Norman kings the fishing industry was regulated by edicts or customs having the force of edicts. Edward I fixed maximum prices of fish sold in London. Best fresh cod could not be sold for more than 3 pence each, or best haddock sold for more than 1 penny each in Lent or for more than ½d. out of Lent.

The state or its agents insisted on quality. In 1382 John Wellingham sold some pieces of conger which his customers said were unwholesome. Twelve men (cooks and regrators) were called to decide, and on their verdict Master Wellingham was placed in the pillory for an hour and the fish were burned beneath him.

According to old chronicles whale meat was not an insignificant article of diet in England. In the time of Edward II. salted whale was considered a great delicacy in some circles; it is questionable, however, whether whale blubber was ever so popular in England as it is in some parts of Greenland. Possibly the ancient friend of Jonah may achieve something of his old importance, if the war continues for fifty years as some soldiers predict; it is said that thrifty Norwegians are putting whales in cans, and selling them under various disguises. Possibly, too, Tommie's stomach, adapted to the bully beef of Chicago, might not find whale flesh unpalatable.

Once upon a time, too, the people of England, not

content with whales, ate seals and porpoises. According to Act 33, Henry VIII: Seal, ace, sturgeon and porpoise were the only fresh fish allowed to be bought of an alien at sea between England, France, Flanders, and Zealand.

The Germans now base their hopes of victory upon the ability of their tin-sharks to starve the English people. But sharks are slow and sluggish—and cowardly creatures; their rage and rapacity makes little effect, after all, upon the food fishes. So also with Germany's tin sharks in respect to Britain's food supply; they annoy, worry and enrage—but they can never be numerous enough to cut off Britain's food supplies. Mistress of the seas Britain still remains, and if the worst comes to the worst she can by more largely reaping the possible harvests of the sea carry on for several years yet.

In Great Britain the question of equipping fishing boats with auxiliary oil engines is receiving more and more attention. Some days ago a representative of the Board of Agriculture and Fisheries informed east coast organizations that applications for loans to equip fishing vessels with motors would have careful attention, as it was considered of first importance to do everything possible to increase the nation's food supplies.

About three years ago the Fisheries Board of Devon and Cornwall obtained £4,000 from the Development Fund, and lent it in small sums at 3½ per cent interest for this purpose. It is estimated that if the available sailing craft in these two countries alone had oil engines installed, the cost—about £25,000 pounds—would be repaid six times over in the first year, even if only 25 per cent more fish were landed. In Norway and Sweden this system has been in operation for several years with very satisfactory results.



Why a Commission Should Be Appointed to Survey the Fisheries of B. C.

We believe the Federal Government, acting as the Governor-General-in-Council will appoint a small commission of independent business men to thoroughly investigate the whole fishing industry of British Columbia before the new regulations proposed for 1918 are enforced by federal action in British Columbia. Our reasons for so believing are many, and grow out of a fairly intimate acquaintance with Canadian public opinion, but particularly is our belief strengthened by the fact that the British Columbia canners, whose large interests are vitally affected by these proposed regulations, are asking only what is fair and what should be accorded them and their industry, against which the proposed government action threatens to militate.

It is reasonable to expect that one of the first questions a responsible minister would ask when contemplating definite changes in regulations relating to the administration of his office is, "What, if any, interests will be injured by this action; what, if any, interests will be benefited?" Ordinarily he would call in to confer with him all the interests likely to be affected, and after hearing all sides of the question formulate his policy. That strikes us as the reasonable manner of administering a high office. But in the case under discussion this was not done either by intent or oversight, and by just this lack of prevision, due possibly to pressure of other and weightier business, in not getting the considered views of the canning industry, the proposed regulations are justly open to the criticism of being *ex parte*, and not in the interest of all.

But we are firm believers in the capacity of the Hon. J. D. Hazen, who has wrought wonders in the development of the fisheries of Canada since he took office. Never before in the history of Canada has there been greater activity in our national fisheries. The popularity of fish for food, that has been evident to all during the past few years, is due almost entirely to the personal work and interest of the minister himself, who has been untiring in his advocacy of the economic value of fish for food as compared with other and more costly forms of food. His annual speech on fish at the Toronto Exposition has become a national event, and by it he has drawn all minds to consider that fish is good food and should be more frequently eaten.

His encouragement of the Biological Board of Canada with Dr. A. B. Macallum, as Secretary, stands as a monument to his appreciation of the need of scientific investigation into the life habits of our food fishes.

A lesser man would have treated this Board as child's play, but Mr. Hazen is a man of culture and vision and sees that the logical development of the fisheries of Canada must be laid upon a foundation of scientifically accurate information if it is to be of permanent value. Mr. Hazen is a man of exceptional mental equipment, with a cosmopolitan outlook, and brings to the discharge of his responsible duties habits of mind, trained in dealing with large affairs and capable of formulating investigations and drafting policies in the manner of a statesman. His support and championship of scientific research within his department is a fair index to the man.

The first announcement of the proposed fisheries regulations for 1918 was made a few days before he left for London with Sir Robert Borden and the Hon. Robt. Rogers, to attend the meetings of the Imperial Conference. He had been unusually busy during the short session of parliament, and was compelled to view many matters hastily and decide others off-hand in order to clear his desk before leaving Canada. That the proposed regulations will not in any event become active till 1918 is suggestive of the possibility that he took this means of making them public in order to test public opinion as their efficacy.

To believe that he would put into execution regulations detrimental to the canning industry of British Columbia without hearing the canners' side of the case is grossly to misjudge a man whose every public act has been the result of careful investigation into the facts and considered application of the just remedy to fit the case as has seemed to him. This was his record while he was Prime Minister of New Brunswick where he began his notable career as a public man. It has been his record since he joined Sir Robert Borden's Cabinet as Minister of Marine and Fisheries and Naval Affairs. We think he will not go back on his record.

At the same time in order to make certainty doubly certain, we suggest to those engaged in the salmon canning industry of British Columbia that they should continue their work of conveying to the Department of Marine and Fisheries their emphatic desire that not only should their side of the case be heard, but also that the evidence on which the Department bases its regulations be presented to them for examination. It is obvious that it would be difficult to have all sides to the controversy assemble in the ante-room with the Minister and thresh the matter out. There is no wish

to duplicate a Donny Brook affair. The questions at issue are too large and too vital to be subjected to the careless vehemence of rival disputants. The proper tribunal, in keeping with the magnitude of the problem to be solved, is a commission of independent business men who will take evidence from both canners and fishermen as well as others interested, and having sifted the facts, present recommendations to the Minister.

It is not difficult for us to understand the official mind that drafted the proposed regulations. Nor have we any trouble in seeing the point of view of the canners and of the fishermen. We also know the spirit that actuated the Prince Rupert deputation that went to Ottawa and we have no quarrel with it. We have made a careful study of the fishing industry in British Columbia. We realize the extent of its operations. We comprehend the business acumen and practical skill, backed by large capital investments that built up the British Columbia Salmon Canning Industry. Hence, in the midst of so many varying and varied interests and points-of-view, we find it hard to believe that the official mind, great though we acknowledge it to be, carries in it all the salient facts that lead to the proof. That official mind is worthy of all praise for it has been the guiding force that has developed our fisheries and prevented their utter depletion. But

when, according to the canners, the whole fabric of the canning industry, financial, administrative and operative, is made restive as it is by the proposed regulations for 1918, then minds others than official must be called in to adduce the facts and peradventure stave off disaster to a national and basic industry.

And that time has come. Therefore, we believe that the Hon. J. D. Hazen, when he has had time to record the signs of public opinion on this question, which will have been brought to his attention, will recommend the appointment of a small commission of independent business men to investigate thoroughly the state of the fishing industry in British Columbia. No harm is ever done by proving the facts. A commission can collect them and logical action arising from their survey can not be successfully disputed. This illustration of the fair way in which all interested in the British Columbia fisheries view the matter, that no one desires anything but a square deal. This attitude should help the responsible minister in coming to a decision regarding the appointing of a commission for we are persuaded that he more than any other person interested desires only fairness to all.

WM. HAMAR GREENWOOD.

Vancouver, June 11, 1917.

THE FISHERIES IN PARLIAMENT.



ON June 5th, Mr. Clarence Jameson, M.P. for Digby, N.S. introduced a motion to appoint a separate Minister for the administration of Canada's fisheries. Mr. Jameson's motion read as follows:—"In the opinion of the House, in view of the food shortage with which this country is confronted, and for the purpose of materially increasing the resources and food supply of Canada, a Department of Fisheries, under a separate minister, should forthwith be organized."

The member for Digby explained to the House that the development of our fisheries was not as great as it should be and that the present Minister (Mr. Hazen) administered 37 different departments—one of which was the fisheries. The placing of so many departments in one man's hands was too much, and the fisheries, the most important and productive department of the whole, could not receive the attention they merited. The Industry was of sufficient importance to warrant a separate department under a separate minister.

Replying, Mr. Hazen, Minister of Marine and Fisheries, outlined the work of his department and stated that the present would not be a good time to make such a change, and that it should be left until after the War. The Liberal members from fishing constituencies strongly advocated Mr. Jameson's motion and urged a more vigorous fishery policy. Mr. Jameson withdrew his motion for the present.



THE Minister of Marine and Fisheries stated in the House the following facts regarding Canada's fisheries.

The fishery value of \$35,860,708 for 1915 will be substantially exceeded by the figures for 1916.

There has been a falling off in the bounty payments during 1916 over those of 1915. The enlistments of fishermen probably account for that, as fewer claims were made.

The boat fishermen, and those who fish in inshore waters now find the motor-boat indispensable to the success of their operations. It gets speedily to the fishing grounds quite independent of winds, tides and, in a great measure, weather conditions. Also, it permits operations over a greater range of fishing grounds than was possible with the old sail boat. We do not know exactly how many motor-boats were used in the fisheries of 1916, but the figures for 1915 and the preceding four years, are illustrative of the rapid advance made in the use of such craft. In 1911 there were 5,580 motor fishing boats in the whole of Canada; in 1912, 5,911; in 1913, 8,700; in 1914, 9,302; and in 1915, 11,097.

It is expected that the value of the Fishery output for 1917 will reach the forty million mark.

CAILLE PERFECTION MOTORS.

One of the well known engines in the fishing industry is the Caille Perfection, manufactured by The Caille Perfection Motor Co., Detroit and sold in Eastern Canada by the Perfection Motor Co. Montreal and in Newfoundland by F. G. House & Co., St. Johns. The makers tell us there are over 1,000 Perfection Motors in constant use in Newfoundland alone where already this year they have shipped over 125 with a large number of unfilled orders still on hand. Caille Perfection Motors are built in a large variety of sizes, models and types. The makers wish to draw the attention of Fishermen particularly to their Perfection Waterproof Ignition System which they claim eliminates all danger of the engine stopping if caught in a storm on account of the Perfection Igniter being absolutely waterproof. They recently tested this by deluging every part of the ignition system with water and the engine continued to run showing the same power and speed as when perfectly dry.

Canada's Fisheries for April, 1917

(Furnished by Marine and Fisheries Department.)

On those sections of the Atlantic coast where the season's operations had begun the weather was favourable generally throughout April.

With the exception of some herring fishing in Westmorland county N.B. and in Kings county P.E.I. no fishing took place in the Gulf of St. Lawrence.

On the Nova Scotia coast the chief features of the month's operations compared with those of April last year were the greatly increased quantities of cod and haddock taken. Of cod there was an increase of 16,986 cwts. and of haddock an increase of 12,639 cwts; halibut also increased by 2,098 cwts. Guysboro and Shelburne returned considerably greater quantities of cod and haddock but the main increase was in Lunenburg county.

In Charlotte county N.B. the sardine fishery for the month resulted in 3675 barrels less than for the corresponding month last year, but owing to high prices the value was \$4,820 greater.

Large catches of alewives were made in St. John harbour during the latter half of April, part of which was used for bait and part salted.

The catch of lobsters for the month amounted to 35-

295 cwts. against 36,125 cwts. for April last year.

Since the opening of the current lobster season on November 15th until the end of April there were packed 16,279 cases, while 31,819 cwts. were shipped in shell. During the corresponding period last year 20,561 cases were packed and 50,602 cwts. shipped in shell.

Two men were reported drowned from Lunenburg County, four from Queens County, and one from Shelburne County. There were also reported from Lunenburg County the loss of a schooner by collision, and the loss of a motor boat from Queen County and another from Shelburne County.

In the Southern district of British Columbia the weather was stormy and wet, while in the north it was favourable for fishing.

The landings of halibut in the north during April were greater by 12,000 cwts. than during the same month last year.

The quantity landed in the southern and Vancouver island districts, however, was less by over 2,000 cwts.

It may be noted that the total value of the landings of sea fish in the whole of Canada for April is 36% greater than that for the same month last year.

Summary of the Quantities and Values of all Sea Fish caught and landed in a Fresh or Green State; and an estimate of the Quantities marketed, or intended to be marketed, fresh, dried, pickled, canned, etc., in the **WHOLE OF CANADA**, for the **MONTH of APRIL**, 1917.

Totals for the month of **APRIL, 1916.**

Kinds of Fish.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh Dried, Pickled, Cann'd, etc	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried Pickled, Cann'd, etc.
	Quantity.	Value.		Quantity.	Value.	
SALMON, cwts.	2,369	24,324	.....	3,155	26,090	.....
Salmon, used fresh (or frozen), cwts. . . . .	.....	.....	2,263	.....	.....	2,868
Salmon, canned, cases . . . . .	.....	.....	72	.....	.....	75
Salmon, smoked, cwts. . . . .	.....	.....	27	.....	.....	.....
Salmon, mild cured, cwts. . . . .	.....	.....	.....	.....	.....	159
LOBSTERS, cwts.	35,295	355,902	.....	36,125	389,961	.....
Lobsters, canned, cases . . . . .	.....	.....	10,520	.....	.....	9,188
Lobsters, shipped in shell, cwts. . . . .	.....	.....	14,267	.....	.....	17,748
COD, cwts.	45,013	131,280	.....	29,683	64,517	.....
Cod, used fresh, cwts. . . . .	.....	.....	10,114	.....	.....	6,977
Cod, green-salted, cwts. . . . .	.....	.....	1,555	.....	.....	1,067
Cod, smoked fillets, cwts. . . . .	.....	.....	300	.....	.....	130
Cod, dried, cwts. . . . .	.....	.....	10,296	.....	.....	6,726
Black Cod, cwt.	6,484	30,254	.....	7,395	32,979	.....
Black Cod, used fresh, cwt. . . . .	.....	.....	5,516	.....	.....	6,675
Black Cod, smoked, cwt. . . . .	.....	.....	484	.....	.....	360
HADDOCK, cwts.	29,831	80,348	.....	17,192	39,860	.....
Haddock, used fresh, cwts. . . . .	.....	.....	10,600	.....	.....	7,309
Haddock, canned, cases . . . . .	.....	.....	283	.....	.....	.....
Haddock, smoked, cwts. . . . .	.....	.....	1,710	.....	.....	2,090
Haddock, green-salted, cwts. . . . .	.....	.....	642	.....	.....	.....
Haddock, dried, cwts. . . . .	.....	.....	4,690	.....	.....	1,901

HAKE AND CUSK, cwts.	3,509	5,934	.....	4,543	5,051	.....
Hake and Cusk, used fresh, cwts.			1,639	.....	.....	1,404
Hake and Cusk, smoked fillets, cwts.			33	.....	.....	.....
Hake and Cusk, dried, cwts.			590	.....	.....	1,047
POLLOCK, cwts.	2,252	3,553	.....	922	1,020	.....
Pollock, used fresh, cwts.			177	.....	.....	370
Pollock, smoked fillets, cwts.			20	.....	.....	.....
Pollock, dried, cwts.	15,859	28,803	692	.....	.....	184
HERRING, cwts.	15,859	28,803	.....	16,516	19,048	.....
Herring, used fresh, cwts.			11,859	.....	.....	4,099
Herring, canned, cases			677	.....	.....	2,451
Herring, smoked, cwts.			621	.....	.....	849
Herring, pickled, brls.			72	.....	.....	2
Herring, used as bait, brls.			1,032	.....	.....	4,298
Herring, used as fertilizer, brls. ....			.....	.....	.....	200
SHAD, cwts.	1	10	.....	1	6	.....
Shad, used fresh, cwts.			1	.....	.....	1
ALEWIVES, cwts.	22,896	23,839	.....	26,565	27,367	.....
Alewives, used fresh, cwts.			4,896	.....	.....	10,065
Alewives, salted, brls.			6,000	.....	.....	5,500
SARDINES, brls.	6,265	30,920	.....	9,940	21,584	.....
Sardines, canned, cases			15,000	.....	.....	15,000
Sardines, sold fresh and salted, brls.			3,265	.....	.....	6,940
HALIBUT, cwts.	27,520	259,446	.....	15,784	95,498	.....
Halibut, used fresh, cwts.			27,506	.....	.....	15,784
Halibut, smoked, cwts.			7	.....	.....	.....
SOLES, cwts.	2,001	9,979	2,001	167	804	167
FLOUNDERS, cwts.	750	948	750	352	357	352
SKATE, cwts.	304	457	304	195	269	195
SMELTS, cwts.	23	179	23	19	124	19
OULACHONS, cwts.	126	756	126	441	1,809	441
WHITING, cwts.	16	64	16	9	27	9
TOM COD, cwts.	5	25	5	.....	.....	.....
OCTOPUS, cwts.	49	392	49	21	147	21
OYSTERS, brls.	340	2,130	340	367	1,776	367
CLAMS, brls.	11,479	16,597	.....	2,985	5,199	.....
Clams, used fresh, brls.			6,486	.....	.....	1,114
Clams, canned, cases			4,993	.....	.....	1,871
SCALLOPS, brls.	200	500	.....	310	720	.....
Scallops, shelled, gals.			400	.....	.....	620
CRABS, COCKLES, &c., cwts.	470	2,373	470	331	831	331
TOTAL VALUE		1,009,013.	.....	.....	735,044	.....

APPROXIMATE RETURN OF CATCH FOR DIGBY COUNTY FOR THE YEAR 1916-1917.

Some idea of the amount of fish taken in the Bay of Fundy by the hardy fishermen of Digby County may be gathered from the following figures, which are a close estimate of the catch for the year ending 31st March last, and comprise the district of Clare and Digby.

Salmon, 47 cwts; Lobsters 20,730 cwts; Cod 47,000 cwts; Haddock 76,260 cwts; Hake and Cusk 146,520 cwts; Pollock 17,300 cwts; Herring 380,000 cwts; Mackerel 116 cwts; Shad 30 cwts; Alewives 385 cwts; Halibut 1,950 cwts; Flounders 435 cwts; Smelts 106 cwts; Trout 50 cwts; Skate 160 cwts; Eels 75 cwts; Mixed Fish 725 cwts; Squid 35 cwts; Clams 2,700 barrels; Winkles 630 cwts; Dulse 8,200 cwts.

The gross value approximates \$1,250,000 and becomes a much larger figure when prepared for the market, in either a smoked or filleted or canned state.

The estimated value of boats engaged in the work is:—

Sailing & Gasoline Boats \$240,000
Smacks and Steam Boats 25,000 \$265,000

The necessary gear and equipment is estimated as follows:—

Nets, Seines, Traps, Weirs, Trawls. \$15,000
Lobster Canneries 55,000
Freezers and Ice Houses 20,000
Smoke and Fish Houses 110,000
Fishing Piers and Wharves 90,000 \$400,000

The number of persons engaged approximates 3,000.

SMOKED SABLEFISH—THE PACIFIC FINNAN HADDIE.

We have had the pleasure of enjoying some fine smoked black cod, or sablefish, through the kindness of Mr. W. Shrubsall, Fish Curer, Prince Rupert, B.C. Without a doubt, this is an excellent food fish, and deserves to be called the "finnan haddie of the Pacific." Mr. Shrubsall is to be complimented on the excellent manner in which he has prepared the fish. It has a great future.

The Fisheries of Digby County



FOR several years Digby County has ranked second to Lunenburg in the value of its catch marketed, but this may not long continue as Digby made a big increase last year and added to its output \$367,600. This was done in spite of the fact that for nearly the whole fishing season two schooners—"Cora May", and "Emerson Fay", of Freeport were lost to the fleet, having been sold for the West Indies fishing.

Fog in the Bay of Fundy largely interfered with our fishermen, and the severe gales did considerable damage, particularly in the district of Centreville, where much gear was lost, boats destroyed and wharves damaged. Notwithstanding this many boats did exceptionally well for several months, and as prices ranged above the average, their owners were well recompensed for their labours. The year has been very free from serious personal accidents—only one terminating fatally, when William Smith, who left Digby with others in a gasoline boat to join the "Lila G. Boutillier" at Centreville was drowned when the boat was smashed to pieces at Theriault's Cove in April 1916.

With fishing being conducted all the year round by the local men, this is an extremely good record, for the work in the winter time on the Banks is particularly hazardous, requiring men of stamina and determination. The fleet is well equipped, and has intrepid skippers, who for years have braved the storms of the Bay, and trip after trip safely made harbour with their catch.

Capt. Ansel Snow and the crew of the "Dorothy M. Smart" have featured on many a Moving Picture screen, and tended to familiarise the general public with some of the hazards of the Grand Bank fishery.

Capt. William Snow, skipper of the "Lila G. Boutillier" has just brought the banner catch to port, and there was considerable elation at Centreville over the 139,000 pound haul.

Capt. Simms has transferred to Yarmouth; Capt. Arthur Casey is making the usual good trips with the "Loran B. Snow", and finding employment for Capt. J. E. Snow's establishment.

The "Swan" Capt. Calvin Stevens, Freeport; "Gyno" Capt. Ed. Thompson, Westport; "Laurette C" Capt. W. L. Comeau, Comeauville; "Bella" Capt. F. E. Comeau, Meteghan River; "America" Capt. Freeman Robishaw, Meteghan; "Nora", Capt. P. Doucette and "Emma D." Capt. F. S. Doucette, both of Cape St. Mary are all adding their quota to the general ingathering, and aided by hundreds of smaller craft are swelling the toll of finny tribe captures, which mean so much towards supplying the needs for food products.

All the way from Digby to Cape St. Mary, warehouses and wharves are alive with workers getting ready the resultant catches for market, and either in the fresh, smoked, or canned state the productions will be shipped to an ever waiting and eager market.

The majority of Digby fish is prepared for export; Canadians as a rule being particularly dainty in their consumption of fish, and only fancy the choicest quality.

New wharves and sheds are being built by Alden Elliott, and Elliott Bros., Charles Harris and Theriault Bros. at Tiverton, who will engage in the fishery business in the future.

Capt. Manning Trask, one of the largest buyers and shippers in the Little River District, passed to his long home recently, and will be greatly missed.

Mr. Frank L. Anderson of the Maritime Fish Corporation, Digby, is endeavouring to encourage the fishermen of Clare from Weymouth to Salmon River to exert themselves in the matter of production, and has arranged to purchase their catches for his Corporation.



THE question of increased production has become one of intense interest to shippers, and Mr. H. B. Short of the Maritime Fish Corporation thinks that the present year will prove to be the best from the standpoint of output. Several new boats have been added, and the prevailing high prices will do much to stimulate the men. In a comparison with Lunenburg, whose vessels are taken from the fishing grounds during the winter, he said the two kinds of fishing were so distinct that it was difficult to adapt the Lunenburg vessels to the Digby fishing. His company offered to fit up two or three schooners for winter fishing, but the offer came to nothing; they could very well do with half a dozen this next fall and winter. In the immediate neighbourhood of what he called "the best fishing ground of the world" with increased and improved facilities he believed the business was capable of permanent expansion. More men and more vessels was the secret.

There are 55 brush weirs in the county built for catching herring and the Government official seeks to advise fishermen of the locality of bait caught; but he thinks the weir tenders might lend much more assistance by advising the office of their catches promptly and regularly.

Want of bait often holds back a vessel, and the scarcity during periods of bad weather affects the returns of market fish.

The Lobster fishery has drawn quite a number of men in its pursuit, and because of the prevailing very high prices obtained has probably been extremely remunerative; but an Inspector of Fisheries in conversation said that with a view of increasing production of necessary food supplies, he was of opinion that it might be a wise thing to curtail this branch of the industry and apply the men and boats to the more essential fishing so greatly needed. He looked upon the lobster more as a luxury than a necessity; at any rate for the purpose of conserving that branch he believed it would be an advantage to cease lobster fishing at the end of May.

The Nova Scotia Fish Co. has had a very quiet period for several months, and is only now beginning to be busy.

The trawler "Swell", Capt. Doyle is discharging a fine cargo of 150,000 and the Dorothy M. Smart, Capt. Ansel Snow has arrived with a similar catch; as both vessels are supplying the Maritime Fish Corporation, the arrival on succeeding days makes them particularly busy. Three hundred thousand pounds of fish in two days is a record for Digby.



ALFRED H. BRITTAIN, Esq., Montreal
Vice-President Canadian Fisheries Association



T. H. JOHNSON, Esq., Prince Rupert
Chairman of the Prince Rupert Branch of the Canadian Fisheries Association

Navigation for Fishermen

Written Specially for Fishermen and the Requirements
of Fishing Craft.



No. 2. The Chart

By FREDERICK WILLIAM WALLACE.



THE chart is merely a plan of the sea or lake just as a map is a plan of the land. In a map, the land is shown in detail with towns, rivers, lakes, railroads, mountains, etc., all marked, but the water areas are left blank. In a chart, the land area is left blank, while the water areas are carefully marked with the depths of water in fathoms; the shoals and rocks are plotted and all the aids to navigation, lights and buoys, are shown. With the depths of water are also given the nature of the bottom — gravelly, rocky, sandy, mud, etc.

Every detail on a chart is of the utmost importance. There is nothing on it of no use. They are the result of many years of careful and painstaking surveys by various clever engineers and navigators, and the Admiralty charts of either the United States and British Governments are extremely reliable and accurate.

In knocking around with many of our fishermen on both coasts and on the lakes, one is struck by the hazy idea they have of the real science of chartwork in its relation to careful navigation. While they appreciate the soundings given on it and can lay off a rough and ready course, yet they ignore the details of the make-up of the bottom; the set of tidal streams; the various differences marking the character of lights and buoys, and their distance visible from seaward; the lines of variation, and altogether do not really understand its value in accurate navigation or make full use of its advantages.

Fishermen tell a yarn of a certain Gloucester skipper, who on his first trip in command, laid off his course on the chart, southeast for Georges Banks. He arrived on the ground and got a trip of fish, and when the wheelsman swung her off for Gloucester again and asked the skipper for the course, that worthy studied the chart for a while and sung out: "Let her go south-east. That course took us here, an' I cal'late 'twill take us back!" The story does not tell us if he steered by the stern end of the compass or not or fetched his port by making sternway.

Another skipper leaving for sea grabbed his wife's window-blind in mistake for his chart and actually made Georges Bank on it, so 'tis said. When studying the window-blind chart looking for confirmation on his soundings, he remarked: "Man an' boy, I've sailed twenty years to Georges Banks an' never saw fly specks on it before!"

A similar yarn is told of a skipper who had laid his course off on the chart by pencil. Running in on the land in a strong breeze and sea, he was becoming anxious, and noting the number of miles the vessel had run by log, he pricked them off on the charted course.

The distance run brought him up almost on top of a blot of ink on the chart and he called the mate. "John," said he, pointing to the blot. "If that's a blot, we're all right, but if it's a rock we'll be gone to Hell in five minutes!"



HOWEVER, we're getting off our course, but these are well founded yarns which give an idea of the "By guess and by God," navigation which is peculiar to many fishermen. If it were not for the fact that the most of them are first class seamen and have vessels that can be hauled up running and dragged off a lee shore under sail, there would be more wrecks and "drowning scrapes" than there are.

The charts commonly used by seamen are drawn on what is known as MERCATOR'S PROJECTION and are called MERCATOR CHARTS. They are drawn accurately to scale so that the distances between each point on the chart can be determined easily by reference to the scale to which it is drawn. In order to determine these various distances the whole globe has been scaled off into LATITUDE and LONGITUDE. The MERIDIANS of longitude run NORTH and SOUTH, while the PARALLELS of latitude run EAST and WEST. The first or prime meridian of longitude runs through Greenwich, England, and all longitude is reckoned east and west of Greenwich. It is at Greenwich where the Royal Observatory is located and British and American chart makers use Greenwich as being longitude 0°. The first parallel of latitude is the equator—commonly called "The Line" by seamen—and all latitude is reckoned north and south of the equator. The latitude at the equator is 0°.

On all the fishing grounds of Canadian and Newfoundland fishermen, the longitude is WEST of Greenwich, and the latitude is NORTH of the equator, therefore in our waters, longitude is always West and latitude North.

Each parallel of latitude and meridian of longitude is divided into DEGREES, MINUTES and SECONDS (written ° ' "). There are 60 seconds in a minute and 60 minutes in a degree. A degree of LATITUDE is equal to 60 nautical miles, but while there is the same number of seconds and minutes in a degree of longitude, yet it is only at the equator where a degree of longitude will equal 60 miles. The parallels of latitude are all at an equal distance from each other, but the meridians of longitude meet at the poles and the further north or south we go the nearer the meridians get to each other. Thus in latitude 59° North, a degree of longitude measures only 31 nautical miles instead of 60.

Keeping this in mind, turn to the chart illustrated herewith and you will notice that it is framed by a graduated scale on both sides and top and bottom. The scale of longitude is marked on the TOP and BOTTOM of the chart. The latitude is marked at BOTH SIDES. In measuring the distance between any two points on the chart always take your measurements from the latitude scale at the sides. If you take it from the longitude scale, your distance will be less than what it should be.

Before one can do any work with a chart it is necessary to have two instruments—a pair of dividers and a parallel rule. The dividers are for the purpose of measuring distances and the rules are for shaping and determining courses. The fisherman desirous of reading up on navigation should, for the purpose of practice, purchase a chart of the coast he is in the habit of fishing around, dividers and parallel rule. The three can be purchased in Vancouver, Prince Rupert, Port Arthur, Toronto, Montreal, Quebec, St. John, Halifax, Sydney, Charlottetown from any nautical bookstore or marine opticians for three or four dollars.

We will suppose that the reader has provided himself with these, and if not, some idea of our explanations may be given by the section of chart published herewith. It is a part of the Nova Scotia coast around Cape Sable and Brazil Rock. On this, as in all charts, the information on them is printed in signs and letters which all mean something.



THE numbers scattered over the chart represent the depths of water in fathoms. Every fisherman knows how to take a cast of the lead and read the depth, but all of them do not pay much attention to accurate determination of the bottom as brought up on the "priming" or "arming" of the lead. More attention to this and use of the signs marked on the chart would give a better idea of the ship's position. Under the fathom figures may be noted various letters—f.s., d.cl., sm.st., etc. This means that the bottom is composed of "fine sand", "dark clay", "small stones", and we give a list of the letters used and their meanings.

b. blue. blk. black. br. brown. brk. broken.
 c. coarse. cal. calcareous (containing lime). chk. chalk. choc. chocolate. cin. cinders. cl. clay. corl. coral.
 d. dark. di. diatom (very small flinty organisms).
 f. fine. for. forminifera (many celled organisms)
 g. gravel. gl. globigerina (deep water forminifera).
 gn. green. grd. ground. gy. gray.
 h. hard.
 l. large. lv. lava. lt. light.
 m. mud. mad. madrepor (branch coral). man. manganese. ml. marl (lime and clay mixed). mus. mussels.
 osy. oysters. oz. ooze.
 peb. pebbles. pt. pteropod. pum. pumice.
 r. rock. rad. radiolaria (ooze containing small shells).
 s. sand. sc. scoria (volcanic ashes). sft. soft. sh. shells. shin. shingle. sm. small. sp. sponge. spk. specks, speckled. st. stones. stf. stiff. stk. sticky.
 t. tufa (soft sandy stone).
 vol. volcanic.
 w. white. wd. weed.
 y. yellow.



THESE signs describe the quality of the bottom very fully and are of the greatest assistance to fishermen who have to depend so much on the lead for locating fishing berths. Many fishermen just give the bottom two classes—hard and soft—and pay little or no attention to the minute differences in clay, ooze, marl, mud and the colors of it which are to be found in various depths and in different places. A better knowledge of the quality of the bottom and the ability to tell what the bottom is composed of outside of just hard or soft will be of great help to the fisherman trying to locate a small fishing spot or the ship's position. With an intelligent use of the lead and the priming on it, together with the chart and the signs, the fisherman becomes more accurate in his work. These chart signs, like the points of the compass, should be committed to memory.

So much for soundings. We'll now take up another series of signs in the aids of navigation of lights, light-vessels and buoys. Lights are usually marked on all charts used by our fishermen with a red and yellow spot of colour on them. Alongside these colour spots you will read something like this—"Lt.Fl.ev.2½ sec. 116 ft. vis. 16m." In plain English this means "Light. Flashing every 2½ seconds. It is 116 feet above sea level and visible for 16 miles in fine weather." The height of a light is reckoned above high water or water level if there are no tides. The visibility is in nautical miles assuming the observer to be 15 feet above the sea. On fishing craft, owing to their low free-board, a light will not be seen as far as marked on the chart and in running for a light in clear weather it is well to keep a look-out for it from the rigging. The farther off one picks up a light, the safer the navigation.

The signs one will find alongside lights on the chart are as follows:

Lt., Lts. Light, Lights.

Lt. Alt. Light Alternating (A light which alters in colour).

Lt. F. Light Fixed (A steady Light, either white, red or green).

Lt. Fl. Light Flashing. (A flashing light at regular intervals—the duration of LIGHT being always LESS than that of darkness).

Gp. Fl. Group Flashing. (Showing at regular intervals, a group of two or more flashes).

Occ. Light Occulting. (A steady light eclipsing or darkening at regular intervals. The duration of DARKNESS being LESS or EQUAL to that of light. Note the difference between Occulting and Flashing).

Gp. Occ. Group Occulting. (A steady light with a group of two or more sudden eclipses at regular intervals).

F. Fl. Fixed and Flashing. (A fixed light which may show a brilliant flash at regular intervals. This flash may show up as a sudden brightening of the fixed light, or the flash light may follow, or be followed by an eclipse of the fixed light).

F. Gp. Fl. Fixed and Group Flashing. (Similar to the above only with a group of two or more brilliant flashes).

Rev. Revolving. (A light which gradually increases to full brilliancy and fades again to an interval of darkness. This must not be confused with an occulting or flashing light, or a fixed and flashing. In all these the change from light to darkness is sudden,

while in the revolving the light increases and decreases gradually).

Also in denoting the character of a light, the following signs are used:

- Alt. Alternating.
 ev. every.
 fl. flash, flashes.
 G. Gn. Green. Gp. Group.
 horl. horizontally—lights placed beside each other.
 irreg. irregular.
 m. miles (of visibility from seaward).
 min. minute or minutes (of light or darkness).
 obscd. obscured (darkened).
 occasl. occasional (in fog signals means a signal which is only given in answer to vessel's signals).
 R. Red.
 sec. seconds.
 (U). Unwatched. (No keeper tending the light at night and cautioning the mariner not to depend upon it).
 vertl. vertical. (Lights placed above each other).
 vis. visible.
 W. Wh. White.

It is important that these signs and their meanings be thoroughly understood. It simplifies navigation by chart wonderfully and yet a large number of fishing skippers know very little about it and can only name the lights they are familiar with. Many a vessel has been lost or had a narrow shave through the skipper being unable to name a certain light. To many fishermen there are only two kinds of lights—steady and flashing—and under the last name comes all the occulting, flashing, group flashing and revolving lights. The watch will report "A flash light off the lee bow." The skipper will take a squint at it and scan his chart for flashing lights. He finds two or three in his vicinity. One may be a revolving white light on shore; another an occulting light on a buoy, and yet another a group occulting on a light-ship. To him, the light on the lee bow may be any of them. He doesn't know for sure, so he damns the Government for balling the lights up and hauls the vessel offshore, or else carries on and trusts to luck that he's all right. Sometimes he is, and sometimes he isn't and the crowd will make the beach in the dories while the vessel pounds to pieces on some ledge—all because the skipper was unable to determine the light.



THE old-timers, when they're not sure, usually stop the ship or jog until day-light—a safe enough course, but a sinful waste of time.

In shaping a course down the coast, the skipper should scan all the lights sighted. If it is a flashing light, count the seconds of darkness and the seconds of light. Thus in running from the Magdalens to Cape North we raise a light which flashes every five seconds. A glance at the chart shows us that Cape North is marked "Lt Fl. ev. 5 sec." Should we raise a light ahead that flashes only every thirty seconds, we're off our course and have the South Light on St. Paul's Island over the bow. Should we class St. Paul's as Cape North and haul the ship to the north'ard to clear the cape, we'd fetch up on the rocks of the island very quickly.

For daylight navigation in entering harbours or coasting alongshore, we have different kinds of buoys. These are of different shapes and painted various colours. Thus we have light buoys, bell buoys, whistling buoys, can buoys, conical buoys, spherical buoys, spar buoys, floats, and buoys with top marks. These

signs are not shown very much on small scale charts, but are used in plans of harbours, ports, rivers and roadsteads.

The shape of the buoy is drawn on the plan with its description by letter according to the following:

- B., Blk. Black.
 Cheq. Chequered.
 G. Green.
 Gy. Gray.
 H.S. Horizontal Stripes.
 No. Numbers.
 R. Red.
 S.B. Submarine Bell.
 V.S. Vertical Stripes.
 Y. Yellow.
 W., Wh. White.

WITHOUT ECONOMY WAR IN DANGER OF BEING LOST.

"If we do not economize in food stuffs we stand a grave chance of losing the war. Our enemies are calculating that America will fail in this, and that our Allies will have to give in."

These are not the words of a professional alarmist. They represent the profound conviction of the man who, in all probability, is better qualified to speak on the food problems of the world than any other man. We are quoting Herbert C. Hoover, who was chairman of the Belgian Relief Commission, and has been named American Food Dictator by President Wilson. They are words which should be taken to heart by every Canadian.

There are two ways in which this situation can be met. One is by increased food production, and the second is by economy in food stuffs. Economy, elimination of waste, is as vital as any other part of war work. Every man cannot fight, every woman cannot work in munitions, but every man, woman or child can economize and can save.

The proper use of savings is to invest them in War Savings Certificates. These are issued by the Government of Canada and are obtainable at any bank or at any post office where money orders are sold. When one buys a War Savings Certificate one is not only providing funds to carry on the war, but also making a nexcellent investment.

For \$21.50 one of these certificates can be purchased, and at the end of three years the Government will pay out \$25, that is, the interest on the investment will have increased its value to that amount. This means interest at nearly 5½ per cent — a much better rate than the money would earn if left lying idle in the bank. Besides the \$25 certificate which costs \$21.50 there is a \$50 certificate which can be bought for \$43. and the \$100 denomination which is purchasable for \$86.

Serve by saving and invest in War Savings' Certificates for your own country's and own sake.

An Act to change the name of dogfish to "grayfish" was introduced by Mr. Hazen, read and passed on to the Select Standing Committee of Fisheries.

The Future of the Canadian Atlantic Fisheries

By A. HANDFIELD WHITMAN, Managing Director,
Robin, Jones & Whitman, Ltd, Halifax, N.S.



DURING the past decade the fisheries of Eastern Canada have not shown a growth commensurate with their importance, in fact, it is doubtful if there was as much fish produced during the decade as during the previous ten years, for, while there has been a large increase in the production of fish used fresh and smoked, there certainly has been a very large falling off in the quantity of dried fish cured for export as produced by our fishermen. The deep sea fishery, as prosecuted by the Lunenburg Bank fishing fleet has barely held its own, notwithstanding the results have made the people of Lunenburg County the richest per capita of any County in the Dominion.

A few years ago the writer put down most of the ills that appeared to be keeping back the development of the fisheries to the lack of any progressive policy of research education and scientific methods on the part of the Department of Fisheries at Ottawa.—It might be as well to say here that the present administration of the fisheries is no worse than under the previous Government.—For any progress from that quarter, the only hope the writer can present, is that some day a strong man will appear and do to the Fisheries Department what Dr. J. W. Robertson did to the Department of Agriculture; namely, revolutionize it.

The Halifax movement of some ten years ago to try and get the Department, the Fishermen, and the Merchants working together under Fisheries Boards to be formed at whatever centres proved desirable was abortive, the fishermen, though their Union leaders opposed the proposition, giving the Department a good excuse to continue to mark time.

The writer has now to admit that perhaps too much was expected of the powers that be, and believes that a large share of the blame for the falling off of the fisheries has been due to lack of initiative on the part of the Merchants. A number of the reforms such as better packages, standardizing of qualities, and up-to-date methods of curing could have been and, in fact, are now being carried out by the Mercantile Houses, so that without any Department help the writer predicts more progress in the fisheries during the next five years than during the preceding twenty years. Towards this end, the conditions brought about by the War are a great incentive for greater production, but the greatest development should come after the War is over, and it is possible to employ steam trawlers to develop the fresh fish industry.



THE past ten years have so to speak been a transition period in the Canadian Atlantic Fisheries. Previous to ten years ago the larger part of the energies of our fishermen were given to the production of dry fish for export, but from that time on the development of the fresh and smoked fish business, and the demand from the United States for Pickled Codfish to be used in the Boneless fish trade, have had the result that today, outside of the Gaspé Coast and a few out of the way places, a very large proportion of the shore catch of Codfish,

Haddock and Hake is marketed fresh or is pickle salted and either manufactured into Boneless fish in Canada, or sold to American concerns for manufacture in the United States, resulting in from 15% to 25% better returns to the fishermen on the salted article, and 25% to 100% better returns when the fish are marketed fresh.

These better returns cannot but bring about a more active prosecution of the fisheries and, as the American buyer is willing to pay high prices for a fancy article, the fishermen soon realized that their old time methods had to be brought up to date.

The biggest scope, in the writer's opinion, for the development of the fisheries is in the production of pickled fish, under which term are included Mackerel, Alewives and Herring. This branch of the fisheries has shown a steady falling off—this owing to bad methods, inferior packages in the case of Herring, and the competition of cheap Newfoundland fish.



IT is in this branch of the fisheries that the writer believes it is up to the Merchant to remedy matters. Already a high class barrel is being used for Mackerel, and, in a very short time, it is thought that the old-time, cheap, leaky Herring barrel will also be a thing of the past. However, this is only one phase of the subject. Just as important is the proper curing and standardizing of the fish. It is in this that the Merchant should show initiative, establish packing houses, buy the Herring fresh from the fishermen, use a first-class barrel and produce an article that will enable him to pay the fishermen more than he could get for his Herring if he packed them himself. Also, the Merchant would have a product marketable in Canada and the United States at a price that would give a fair profit, instead of the former inferior article, only saleable in the West Indies.

To sum up, Eastern Canada has illimitable fishery wealth at her doors. The War has created an extraordinary demand for fish goods. Opportunity knocks at the doors of both Fishermen and Merchant. Let all be up and doing. It is just as patriotic to increase the production of fish, in these days of stress, as for the farmer to increase his acreage. It is up to all interested in the great fishing industry of Canada to do their best to produce a high-class article, so that when the War is over, the reputation gained for reliable goods will hold the consumer against foreign competition. There is no industry in Canada more promising for development with profitable results than the Fisheries.



Increasing Fish Production in Nova Scotia

Opinions of the Trade and Particulars of Their Plants.
Culled by the Canadian Fisherman.

A. Wilson & Son, Halifax.



THE firm of A. Wilson & Son is situated on Morris Street, Halifax. It was established in 1878 by Mr. A. Wilson, and merged into the Leonard Fisheries in December, 1916.

"We need more men in the fishing industry," said Mr. S. Y. Wilson, the present head of the firm. "A larger production of fish food would, without a doubt, be helpful in present conditions, but an increase of our fishing population and improved methods of catching and curing are indispensable to this end. Our present methods of cure are more or less by guess or by God.

"The introduction of steam trawlers is, to my mind, necessary to keep up with the demand for fresh fish trade, and I am strongly of the opinion that if the Scotch method of curing herring were adopted here efficiently, it would in a very short time double the value of our herring catch. The same, of course, applies to the other varieties of fish.

"Some classes of navigation are being given now in our Nova Scotia Technical College. This should be extended and technical education applied to every branch of the industry. Better cure, more careful handling, better packages and up-to-date standardization of the product is what we all should work for. No doubt one would find considerable difference of opinion in the trade as to what should be taken up first, but I think you will find, generally, that all connected with the trade will agree that a vast improvement could be made if co-operation were secured with those ends in view."

Robin, Jones & Whitman, Halifax.



THE firm of Robin, Jones and Whitman was established in 1766 by Charles Robin of Jersey. Associated with the Managing Director, Mr. A. H. Whitman, are Messrs. A. E. Jones,

A. King, W. F. Hamon and D. R. Clarke. The firm possesses twenty branches in the Province of Quebec, one in New Brunswick and five in Nova Scotia. These include wharves, warehouses, general stores and drying plants. 1,000 men are employed during the season.

"If we are to increase production of fish in this country," said Mr. Whitman, "we must not only have more fishermen but we must relieve the present salt famine. There is no doubt, of course, that the present conditions fully justify increased production. I do not know that the Government can do a great deal in the way of practical instruction, as I consider that our merchants are quite capable of handling their end of

the business, and our fishermen have a good working knowledge of the methods of cure that after all is said and done are best suited to Canadian conditions. I consider that our fishermen are getting the last cent of value out of the fish produced by them, and that our merchants and fishermen may be depended upon to look out for any so-called improved methods that prove to be really profitable. The development of markets, of course, is up to the merchants, not to the fishermen. In my opinion our foreign markets are now pretty well developed. The real difficulty is to obtain supplies to meet the demand."

W. & C. H. Mitchell, Halifax.



THE firm of W. & C. H. Mitchell, Limited, is situated at 121 Lower Water Street, Halifax. It was founded by Walter and C. H. Mitchell, in 1896. The present members are: Messrs. Walter Mitchell, C. H. Mitchell, C. S. Stayner, W. R. Wakely and Walter Mitchell, Jr.

The plant consists of a large wharf with a commodious warehouse, a large sized store house for storing dry and pickled fish and a well equipped drying plant. Other equipment includes an electric elevator and hydraulic press for packing fish. Forty persons are employed by the firm.

Mr. Walter Mitchell believes that three steps should be taken in any campaign looking toward greater production in the fishing industry. In his opinion the first of these is education, the second, education and the third is education. He believes that the education of fishermen is the remedy for the present unsatisfactory condition of affairs, as if this were undertaken in a practical way most of the problems would solve themselves. "I believe that present conditions decidedly justify increased production," said Mr. Mitchell, "and I would favor the appointment of experts at the principal centres, with sufficient staffs, to undertake instruction of fishermen in all the most modern methods of fishing and curing. The greater knowledge the fishermen possess of his industry the more willing he is to co-operate with the merchant in effecting such improvements as will be mutually beneficial. It seems to me that there are many aspects of the fishing industry that have not been impressed upon our fishermen. Our younger fishermen are intelligent enough, and I am sure that they would enter willingly into any practical scheme for the greater development of their industry. Of course, as you will understand fishermen by them-

selves are not in a position to do very much to develop markets either at home or abroad. The development of markets is largely in the hands of the fish merchants, but in order to develop markets for any product, the quality of the product must be raised and maintained. This part of the work is largely in the hands of the fisherman, and that is why I say that co-operation is essential if the highest degree of success is to be attained."

O'Leary and Lee, Halifax.



THIS firm was established in 1911 by Richard O'Leary of Richebucto, N. B., and G. Stanley Lee of Halifax. The head office is located at 85 Lower Water Street, Halifax. The lobster packing plants are situated at East Jeddore, Halifax, and Deep Cove, Yarmouth County. About fifty persons are employed.

Bay. 250 persons are employed during the season.

"There surely exists somewhere a rational method of instructing fishermen in up-to-date methods of fishing," said Mr. J. Foster Rood. "I have often thought that a thoroughly practical text book plainly and simply written and well illustrated, showing modern methods of cure, could, with advantage, be distributed among our fishermen. I know several fishermen who would be glad to attend a course of instruction in modern methods if such were available. Something is being attempted now by the Government in the way of demonstration, proper cure and barrel making, etc., but such instruction should be systematic, and demonstration should be followed up by regular courses of practical training.

"Our fishermen in their methods of working are following too closely the methods adopted by their grandfathers. It does not seem to be fully impressed



250,000 lbs. of fish drying at Digby, N.S.

"Under present regulations I do not think that the lobster fishing can be increased in Nova Scotia," said Mr. Lee. "I do think, however, that more Government action should be taken in regard to the utilization of waste in this industry. Something more besides the crudest kind of fertilizer should be obtained from the large amount of wastage in lobster packing. It seems to me that this is certainly a matter for investigation by the Conservation of Resources Commission."

The Dominion Fisheries, Limited, Halifax.



THIS firm is located at 47 Upper Water Street, Halifax. It was established in 1911 by Mr. J. Foster Rood, and with him, on the Board of Directors are W. E. Rood and G. C. Leslie. Branch factories and warehouses are situated at Grand Etang Margaree Harbour, Friar's Head, Broad Cove Marsh, Mabou, Merigomish and Terrence

upon them that their industry is suffering from lack of adoption of modern methods and equipment. For instance the waste of by-products in the fishing industry in this country is well nigh complete. I would say that assistance should be given by the Government in establishing plants in different localities for the purpose of transforming fish waste into fertilizer, etc., such assistance to be in the form of a grant of say fifty per cent of the cost of such plants."

Peerless Packers, Halifax.



THIS concern is located at 41 Upper Water Street, Halifax. The firm was established in 1915 by Mr. J. W. Smith. With him are associated Messrs. H. A. Smith, John Murray, William Smith and E. G. Whitman. This firm packs lobsters, haddock, cod, scallops, clams, besides blue-

berries, apples, evaporated and canned. Forty persons are employed.

"One way of reducing the present high cost of living," said Mr. J. W. Smith, "is to increase our production of fish. There is no doubt whatever that this is possible, but to do so we require not only an increased number of fishermen but men trained in a practical manner. The Government is making some attempt now to instruct the workers of the fishing industry, and the advantages of this work are already being felt.

"To my mind, however, there is no reason why we should not have an institution down here devoted to the fishing industry in the same way that our Technical College is devoted to certain trades and our Agricultural College is devoted to farming. There need be no fear that the fishermen would not countenance and support such an institution. I am confident that the attendance would be most gratifying once it were

or abroad. On the other hand, without good work on the part of the fishermen, fish merchants are naturally greatly handicapped.

"There is no reason in the world why there should be more waste in the fishing industry than in any other industry. All so-called fish waste is merely unutilized by-products and could be manufactured into useful articles of commerce. I know for a fact that not only fertilizer, but chicken feed and cattle feed can be manufactured to advantage out of the so-called fish waste."

Boutilier's Fish Market, Halifax.



THIS establishment is located at 30 Bedford Row, Halifax, and was established in 1902 by the Halifax Cold Storage Company. The firm retails fish throughout the city of Halifax. Twenty persons are employed.



N. & M. Smiths' Wharf, Halifax, N.S.

found that the institution were really practical. If for instance such an institution would only insure once for all the use of only first class packages for pickled fish its establishment would be, in my opinion, fully justified.

"I should like to see a larger share of co-operation in the fish business. Our fishermen should co-operate with the fish dealers. The one is essential to the other, and a growing sense of this would be entirely beneficial all round. Left to themselves our fishermen could never develop markets advantageously either at home

"I would suggest the opening of a class in fish curing," said Mr. I. Dauphinee, the Manager. "I know personally several fishermen in this city who would be only too glad to take advantage of a class of instruction, and if the class were under the guidance of an expert there is no reason why excellent results should not be obtained. There is no doubt in my mind that those engaged in the fishing industry should do their utmost to increase production at the present time. This would not only be profitable to them but would be a God send to many people who are no longer able

to purchase meat at the present prices. Close contact with consumers, such as one has in the retail trade, makes retailers realize even more strongly than wholesalers the value of fish food in the economic nourishing of a nation.

"There is a good deal of talk about the waste in the fishing industry. So far as we are concerned there is no waste around this establishment. The market gardeners around this city call every day and relieve us of all product elsewhere unsaleable."

S. R. Giffin & Sons, Goldboro, N. S.



THE firm of S. R. Giffin & Sons, Goldboro, was established in 1892 by Mr. Samuel R. Giffin. The present members are Messrs. Oswald I. Giffin and S. Osburn Giffin. The plant consists of fish and salt warehouses, general stores, feed store, cold storage plant, ice houses, freight sheds, curing sheds, wharves, etc., situated at Goldboro, New Harbor and Port Beckerton. Fifty men are employed.

"To increase production of fish here to advantage," said Mr. Oswald I. Giffin, "we should have better shipping facilities. As it is now, we have only one steamer per week calling at Goldboro. The nearest railway station is 50 miles, way across the country. You can see how we are handicapped in the shipping of fresh fish.

"We also need a fleet of off-shore fishing vessels carrying from five to ten single dories. If firms could engage profitably in the shipping of fresh fish it would pay them to provide the fishermen with these vessels. The fishermen here have not the resources for obtaining the craft.

"I do not know that the Government can do very much in the way of instructing fishermen in the curing of fish. Any fishing concern of any importance must surely acquaint themselves with the most modern methods of curing different kinds of fish for the different markets. If the fish merchants have this information, nothing much more is required. In this district, fishermen sell most of the fish they catch to the fish firms, and these firms do the curing.

"Shipping firms are still greatly handicapped through the lack of a first class package that would retain the original pickle. A tight barrel is absolutely essential if our foreign trade in herring and mackerel is to be developed. If the merchants can get the fish it is up to them to cure the fish properly. The development of markets does not by any means present a formidable problem at the present time.

"A fertilizer plant on Harbor Island could we think be operated at a profit. The suggested location is an ideal spot for such a plant, as it would be central for securing all the dog fish and fish offal along the shore from Liscomb to Tor Bay."

W. C. Smith & Company, Limited, Lunenburg, N. S.



THE firm of W. C. Smith & Company, Limited, Lunenburg, was established in 1899. Associated with Mr. W. C. Smith, Managing Director, are H. H. MacIntosh, Secretary, G. A. Smith, Benjamin, Cook, B. C. Smith, and Artemas Schnare, Directors. The plant consists of a large four story building situated on Montague Street in which is kept all the general outfitting and ships stores, also flour and feeds. Two large warehouses on the wharf

property which are used to store and pack dry fish for shipments in casks and boxes, together with two boat houses, where the fishing boats are built for the vessels. The wharf property consists of one long wharf and one side wharf, with good room for handling the shipping.

"The question of increased production," said Mr. Smith, "resolves itself into the solving of more practical fishermen. The natives of this country seem to be particularly adapted for carrying on a fishing industry, and if we had a few thousand more of the same kind their services could certainly be utilized to great advantage. Recent steps taken by the Government in the way of instructing our fishermen in modern methods of curing are to be commended, particularly in the pickled fish branch of the business.

"It seems to me that our fish dealers should get together and advertise our goods. Co-operation in this should be productive of much good. The world is just beginning to realize the value of fish as a food, and in my opinion the time is ripe for taking full advantage of this especially in view of present abnormal conditions in the food markets. Many of the best fishing districts of Nova Scotia are handicapped through insufficient railway service.

"As to the utilization of waste, I understand that steps have been taken by the American Government to can the dog fish and sell it as grey fish, and we understand one firm in Gloucester has orders for many thousands of cases. If the Canadian Government would take this matter in hand we have no doubt but what dog fish would also be used as a food by our Canadians.

"By the way, I should like our fishermen to know they should remove the black napes from the cod. We tried this plan last year and as a result we got 50 cents per quintal more for the fish."

G. E. Abriel Popes Harbor, N. S.



THE firm of G. E. Abriel, Popes Harbor, was established in 1884 by John Abriel. The plant consists of a lobster factory, can shop, store houses, freight sheds, wharf, etc. A commodious herring packing factory will shortly be erected.

"To increase production in this district," said Mr. Abriel, "we should have lobster hatcheries on the same scale as those established on the New England Coast. We should also have cold storage facilities for storing bait to help out in our cod and haddock fishing. The herring industry would be benefited by the establishment of adequate storing plants to take care of a larger catch.

"There need be no waste whatever in our fishing industry. All so called waste could be manufactured into fertilizer. The waste should be collected over wide areas and brought cheaply to factories in suitable smaeks or auxiliary schooners of shallow draft and good carrying capacity. The waste could be salted just sufficiently for temporary preservation.

"So far as cod, haddock, herring, halibut, etc., are concerned, production could certainly be increased. Our lobster resources are, in my opinion, being taxed to the utmost at the present time. Catching and curing should be two entirely different callings. I would favor instructing those who wish to become experts in modern methods of cure. Fishermen should be instructed in better methods of fishing. Instruction in curing, by experts, to include practical demonstration. The Government should give financial assistance to

firms enterprising enough to import expert curers, as in the Scotch Herring Industry. This affords excellent instruction for all the employees of such a firm engaged at the work.

"I most heartily favor the Scotch method of curing herring. The use of smaller mesh nets is necessary, in order to bring fish of a more suitable size than those at present caught, which are much too large. Beam trawlers increase production of other lines, but whether their use is beneficial to the industry is to be questioned.

"An advertising campaign is absolutely essential to the development of markets for our fisheries. This is a question that I think concerns not only individual fishermen and fisheries associations, but also our Governments. Better shipping facilities are also necessary. Just now tonnage is the difficulty. A great deal can be accomplished by educating for the proper cure. If any fish sell better than ours, our cure should be changed accordingly, so that no better product than Nova Scotia fish would be available."

In doing so, however, we should be very careful to endeavour in every way possible to supply only fish of first-rate quality. We have an opportunity just now to capture markets in many directions, and it seems to me that our fish merchants everywhere should get together and co-operate with the fishermen in safeguarding the interests of the trade."

Thomas Williams & Son, White Point, N. S.



THIS firm was established in Yarmouth in Point, Victoria County, N. S.

"The fishing industry will never amount to much in this district," said Mr. Williams, "unless we get better steamship service. We can produce the fish all right, but this is an out of the way place and we are handicapped in getting our fish to rail. Our fishermen too are complaining that our local breakwater is not kept in repair. I think it is up to the Public Works authorities to see that this matter is attended to without further delay."



Lockeport Cold Storage Co., Ltd., Lockeport, N.S.

A. & B. Loggie Company, Limited, Mulgrave, N.S.



THE well known firm of A. & B. Loggie Company, Limited, of Loggieville, N. B., established a branch at Mulgrave, Nova Scotia, in 1915.

The members of the firm are Messrs. Andrew Loggie, President, Robert Loggie, vice-president and F. P. Loggie, secretary-treasurer. The plant at Mulgrave consists of canning and smoking houses and cold storage plant. Sixty-five persons are employed.

"Yes, I think we should increase production," said Mr. F. P. Loggie, "and to effect this I believe in the efficiency of the Otter Steam Trawler. There is no doubt to my mind that the day is drawing near when most of our fishing will be done by trawlers, and the sooner we prepare for the change, the better. In the meantime it is difficult to increase production owing to the scarcity of men.

"We are passing through an abnormal industrial period, and the withdrawal of so many men from economic pursuits has largely increased the scarcity and the cost of nearly all kinds of foods. The market for fish was never better than at present, and I feel we should all do everything within our power to take advantage of this extra demand.

E. K. Spinney, Yarmouth, N.S.



THIS firm was established in Yarmouth in 1873 by Spinney, Kenney & Co. The plant consists of six mercantile warehouses. Fifteen persons are employed.

"If we are to increase production of fish," said Mr. Spinney, "we must provide properly equipped vessels and offer inducements that will attract the fishermen to operate from a home port rather than seek like employment in a foreign port.

"I consider that present conditions unquestionably justify increased production. I also believe that great financial benefit would result if immediate and effective steps were taken for the practical training of fishermen in every fishing centre of this Province.

"It seems to me that special attention should be given to the curing and packing of herring by the Scotch method. Demonstrations should be given along these lines and the work should be made an inherent part of our technical education system in Nova Scotia. There is no doubt that a course of training of this kind if properly presented would be taken up by the fishermen.

"The employment of auxiliary power to vessels engaged in catching fresh fish for the market is of great

value. The use of gasoline engines enables the fishermen to make close connection with trains and boats, thus ensuring a more evenly balanced market.

"I would suggest the formation of a strong combination among fishermen, distributors, and transportation companies. Their interests so far as fish markets are concerned are identical. There should be only cordial and friendly feeling among them. Such a combination, together with practical training of the fishermen and a campaign of advertising to influence the consumer would be certain to bring gratifying benefits to the trade.

"No industry in Nova Scotia gives greater promise of financial results to-day than the fisheries, but the maximum results will not be obtained without additional capital and greater energy. We should all strive for a greater excellence of product and greater attractiveness in the package. These features attained, the development of the markets by the distributing end of the trade would prove an easy task."



Nova Scotia Swordfish.

Joseph E. Snow, Digby, N.S.



THIS firm was established about twenty-five years ago at Digby by Mr. Joseph E. Snow. The plant consists of a wharf and buildings suitable for handling dried and smoked fish. Ten persons are employed.

"To increase production in this district," said Mr. Snow. "we would require more vessels, more boats and more labor. We should endeavor to create a

greater demand for fish. People should be educated to appreciate the value of various kinds of fish foods. We are doing what we can to get up a good article, both as regards finnan haddies and salt fish. Of course, we think that our Digby finnan haddies are the best in Canada, and we find that a good many people agree with us in so thinking. So far as salt fish are concerned we are putting up as good an article as circumstances will allow us.

"As far as waste is concerned, the great trouble seems to be that the stuff is so widely scattered. The waste products would have to be gathered over a very large area in order to make a success of such a venture as a glue factory."

Zwicker and Company, Lunenburg, N.S.



THE firm of Zwicker and Company, Lunenburg, was established at Lunenburg, in 1789, by John Zwicker. Associated with the President, Mr. Arthur H. Zwicker, is Mr. E. Fenwick Zwicker, Secretary and Treasurer, and W. Norman Zwicker, Vice-President. The plant is located at the water front at Lunenburg, and consists of two large wharves, six fish warehouses, patent steam fish drier, provision and flour store, cordage and line store, general store, and three offices. About forty men are employed.

"Conditions" said Mr. Arthur Zwicker, "fully justify the increased production of all kinds of fish. Everything is moving upwards now. What is really needed, perhaps more than anything else, is more experienced hands to man the fishing fleet. Take this port of Lunenburg. We could easily employ, profitably, double the present number of fishing vessels, and double the present number of fishermen. We are just now somewhat badly off for experienced navigators and responsible young men for masters.

"We also require several plants for handling the cutting business for boneless and smoked fish. Every part of a fish should be saved—even the fish washings, which are very beneficial for cultivating the land. The fish skins should also be saved as they can be utilized for boots and shoes to take the place of leather. The skins can be successfully tanned into a high grade of merchantable leather, and sold at a fair price to pay the producers. All kinds of fish oils should be saved, as big prices are being paid the world over for oils and fats to-day. Lobster shells should be saved also and used as a prepared fertilizer on garden plots making a very rich manure.

"I think proper steps should be taken at once to encourage all these industries."

William Smith & Company, Gulf Shore, N.S.



THIS firm of Lobster Packers, situated at Gulf Shore, Cumberland Co., N.S., was established in 1892. The present members are Samuel Smith, President, and Theodore F. Smith, Secretary, while the directors are Mr. George F. Smith, and the Bank of Nova Scotia. The plant consists of three lobster factories, with warehouse, wharves, etc. Eighty-five persons are employed.

"Lobster packers are in a quandary to-day," said Mr. Samuel Smith, "owing to the curtailment of lobster imports by the British and French Governments. Packers here are in straits to know just what course to follow. Personally I cannot see where present conditions would justify any increased production, indeed, unless we are shown where our product can be market-

ed I would say that conditions to-day would justify decreased production.

"The decreasing of production would give the lobstersters in Nova Scotia a chance to grow and multiply. More stringent measures should be taken in enforcing the law and prohibit the illegal catching of lobsters. There should be no respect of persons in this connection and every fisherman caught fishing illegally should be prosecuted. I would suggest that the government stop granting further licenses, as the business just now is somewhat overdone.

"In this district all the lobster waste is given to the farmers who distribute it over their lands for fertilizer."

Henry Burgess, Port Mouton, N.S.



THIS firm was established in 1885. The present members are Messrs. Henry and Fred Burgess. The plant consists of two lobster factories with bait houses, etc., which are situated at Port Mouton, Queen's County.

"Some steps must be taken," said Mr. Henry Burgess, "if the interests of the lobster fishermen are to be safeguarded. All lobsters under eight inches should, when caught, be thrown back into the water. As a matter of fact, I think it would be well to close the lobster factories for a while. The markets are disorganized and we should seize this opportunity to allow the lobsters to develop and multiply. I would like to say right here that the law for the protection of lobsters is being violated so generally that it would really be almost as well not to have any laws of this kind at all. If the industry is to be carried on I would suggest that only the largest lobsters be retained and these all shipped alive."

George W. Atkins & Company, Little Harbor, N.S.



THIS firm was established in 1892. The present members consist of George W. Atkins, Joseph R. Atkins, John A. Cameron and Reuben Atkin. The plant consists of three lobster factories situated at Little Harbor and Carribou Island, Pictou County, N.S., together with cook houses, can shops, wharves, etc. Twenty-four persons are employed.

"Something should certainly be done to protect the lobster fishery," said Mr. George W. Atkins. "There is a serious decline in the number of lobsters caught in this district, and it seems to me that our lobster laws should be more strictly enforced. At present practically every lobster caught is either canned or shipped alive, while in the interests of the industry half of the catch should be returned to the water. There is a chance now to conserve the lobster industry that will probably not occur again in this generation."

F. B. Lent, Westport, N.S.



THIS firm is situated at Westport, Digby County, N.S., and is engaged in the wholesale fish business curing finnan haddies, fillets, and dealing in fresh fish, boneless cod, cod oil, etc.

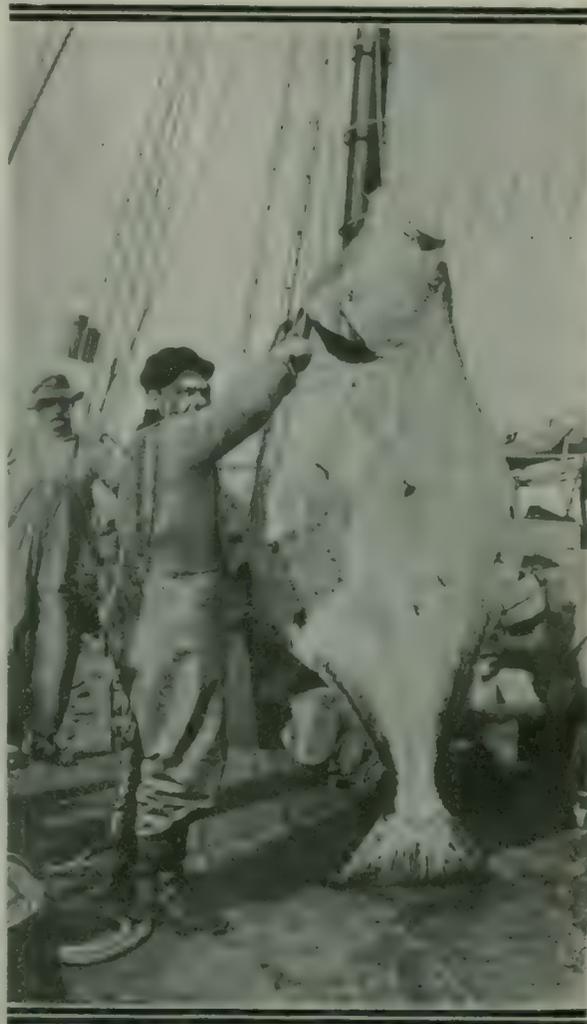
"In order to increase the production of fish in this district," said Mr. Lent, "our means of transportation must be improved. We have no direct boat to Yarmouth connecting with the boats to Boston and the lack of this advantage is very detrimental to the interests of the fishermen here. The convenience of such a boat would immediately stimulate production, and I hope something can be done in the near future towards this end."

Alexander Hines & Company, Ingonish Ferry, N.S.



THIS firm was established twenty-two years ago at Ingonish Ferry, Victoria County, N.S., and the plant consists of a lobster factory with the usual subsidiary structures.

"We are scarce of help here," said Mr. Hines, "we want more fishermen and more fishing gear. At present marketing conditions are not as good as previously, but personally I do not think we would call a halt on that account. There are too many people dependent on the lobster industry for drastic measures to be taken without the most serious consideration."



Nova Scotia Halibut.

Mackenzie & Munro, River John, N.S.



THIS firm was established in 1892, at River John, Pictou County, N.S. The present manager is Mr. C. E. Carruthers. The plant consists of a large lobster factory together with cook house, wharf, warehouses, etc. Eighty persons are employed.

"To increase production of lobsters here," said Mr. Carruthers, "we need a hatchery. We should also like to have a longer season and rigid regulations applied whereby spawn lobsters should not on any account be taken. All out of season fishing should be absolutely prohibited. Unless steps of this kind are taken the lobster industry will suffer serious decline in this neighborhood."



John McInnis, Wallace Bridge, N.S.

THIS firm was established in 1880 by Mr. John McInnis, at Wallace Bridge, Cumberland County. The plant consists of a lobster factory with bait house, lobster shop, cook house, can shop, etc. Twenty-four persons are employed.

"Just at the present time," said Mr. McInnis, "it appears to me that the lobster industry in this country is at its limit. Lobsters are on the decrease here owing to the lack of efficient protection. What is wanted is officers of the right stamp who will abolish illegal fishing in the fall of the year.

"There is no real lobster waste in this district; it is all used by the farmers as a fertilizer."

A. V. Conrad, Riverport, N.S.



THIS firm was established in 1889 at Riverport, Lunenburg County. The plant consists of seven store houses, with wharves, etc. 110 men are employed.

"I certainly cannot fill the demand made on me for fish products," said Mr. Conrad. "We can dispose of far more fish than we can secure. The real problem with us now is the securing of additional labor.

"Of course, I fully realize that much is to be desired in the way of better cure. Almost anything in the way of fish will sell just now, but present conditions will not last. While we have the advantage of all export trade just now, we should see to it that the products we export are of a high grade. I believe in educating the fishermen, and I think that practical demonstrations carried on in fishing centres can be productive of nothing but good. In my opinion, our fishermen are rapidly becoming convinced of the necessity of adopting modern methods, both of catch and of cure, and any practical demonstrator will be welcomed amongst them. In fact, I know personally of forty young fishermen who would be glad to attend any practical course of instruction.

"I know our fish should not be so heavily salted, and we do slack salt them on the spring trips, which are short trips. As to the summer catch, when the trip is usually three months, I would suggest that the fish caught on the last part of the trip be slack salted instead of all heavy salted as is customary. Our fishermen should be impressed with the necessity of always having in mind to take the best care of their fish from the time they are taken off the trawl until they are properly cured for market. Carelessness at any stage of the process is fatal to the highest degree of success."

J. Ernst & Son, Limited, Mahone Bay, N.S.



THIS firm was established in 1869 by Abraham Ernst. The present members of the firm are Selvyn A. Ernst, Willis A. Ernst and Arthur L. Ernst. The plant consists of two stores of general merchandise, lumber wharf, fish store and wharf, fish yard and four fishing vessels. The fish wharf contains a large fish warehouse of three stories for handling dry and pickled fish. A 300 ton vessel is now in course of construction at the shipyard. 120 persons are employed.

"I would like to increase our fish fleet," said Mr. Selvyn Ernst. "We could do this if we had more men, but it is easier for us to get the vessels than the men, as we build our own vessels. The question of increasing the production of fish here hinges merely on our ability to increase our equipment. There is plenty of fish in the sea, and the markets are active."



John Mason and Company.

THIS firm was established in 1904, by Messrs. John Mason and Charles L. Mason. 14 hands are employed.

"In order to enlarge the production of lobsters in this district," said Mr. John Mason, "a hatchery must be established here. We derive some benefit from the one stationed at Caribou, and in my opinion another one here would pay well. The ground off shore is very favorable for production, and in any event more spawn should be deposited in the Caribou hatchery.

"Before our Nova Scotian fisheries are fully developed we must have refrigerator cars and cheaper express rates. Our firm has, on the whole, found the Canadian market somewhat unsatisfactory. We have forwarded fish in good condition to Upper Canada cities, and have received almost nothing in return. The American markets are first rate, but there we are up against commission hogs. Would it not be possible for the Department of Fisheries to appoint an experienced and reliable person in the most central location to whom shipments of fish could be regularly consigned?"

D. Sproule & Company, Digby, N.S.



THIS concern is located at Digby, and was established in 1882, by Messrs. David and Orvin Sproule. The plant consists of store, warehouses, smoke houses, salt sheds, curing and drying houses and wharves.

"The great difficulty down here in the way of increasing production," said Mr. David Sproule, "is the scarcity of help, and not only do we want more men, but we want more vessels or trawlers.

"I would suggest that all fish offal and waste fish instead of being thrown overboard be brought to shore. Fish thrown overboard contaminates the water, and in my opinion tends to drive fish away. It seems to me that such waste could be utilized by fertilizer factories, centrally located and subsidized by the Government. The extra production of grain, vegetables and hay that could be grown by the use of fish fertilizer would more than repay the Government for any outlay.

"The practical instruction of fishermen is a live subject at the present time. I believe in this form of education, and I know of several young fellows in this vicinity who would be glad to avail themselves of such practical training, if it were available. Could not the Department of Fisheries have a simply written book prepared embodying the essential points of modern methods of catching and curing of fish, and the making of proper fish barrels and boxes? Such a booklet could be distributed, free, or at a very small cost, among the fishermen.

"I would suggest also that fish trade here endeavor to interest more largely the British Consuls and Trade Representatives in foreign countries. Of course, the question of transportation enters very largely into any discussion of the fish business. There should be greater co-operation among fish dealers in order to obtain the desired end in that connection."

W. S. Lawrence, Margaree Harbor, N.S.



THIS firm was established 65 years ago by Mr. Samuel Lawrence, at Margaree Harbor, Inverness County. The plant includes a commodious wharf with storehouses, freezer, lobster factory, warehouse and general store.

"What we need here before we can increase production of fish in this district," said Mr. Walter S. Law-

rence, the present head of the firm," is much needed improvement to our harbor entrance. There are plenty of fish to be caught, but our fishermen are greatly handicapped, owing to the difficulties of exporting and importing. Our fish export would be very largely increased, especially our fresh fish export, if we only had better shipping facilities. It seems to me that the prompt and proper transportation of fish is a matter that should receive the earnest consideration of the trade at the present time."

Farquhar & Company, Halifax, N.S.



THIS firm was established in 1887, and is located at 163 Lower Water Street, Halifax. The present members include Mr. J. C. Farquhar and Mr. C. W. Rowlings. Messrs. Farquhar have no special plant but only pack occasionally themselves. They deal principally in herring purchased from the fishermen.

"If we are to have a larger production of fish," said Mr. Rowlings, "we must have more fishermen with increased equipment, such as various kinds of nets, traps and sea-going boats. There should also be greater care and attention to curing, and a special catering to the individual requirements of each market. Our Government representatives, of Trade Commissioners, should be keen business men. Too many Governments give appointments of this kind to political friends who are, in a large number of cases, men totally unfit for such positions. Such representatives should be carefully selected, thoroughly trained and well paid.

"I believe that our fish industry should be given more publicity. After all, the consuming public can be reached only in this way. Judicious advertising combined with greater care in curing would revolutionize the trade. Fishermen and curers should combine in the interests of the industry, and these members of the trade should be kept fully advised by lectures and pamphlets as to the value of saving the various waste and by products."

H. A. Smith & Sons, Port Hood Island, N.S.



THIS firm was established in 1857, by Mr. John Smith, father of Mr. H. A. Smith, the present head of the firm. The other members of the firm are Messrs. G. F. Smith and R. M. Smith. The plant consists of a solid crib wharf, 225 feet long, and warehouses, bait shed, supply store, ice house, smoke house, etc.

"If production is to be increased in this district," said Mr. H. A. Smith, "we should have better protection for boats and fishing craft. I would suggest an extension of the break-water at Smith's Cove, so as to give the larger boats safe anchorage during the fall storms.

"During the months of August and September the fishermen around here are held up in their operations on account of the dog fish pest. If there were a ready market for the dog fish our fishermen would save a lot of time and earn something during the entire season. There seems to be room in this vicinity for a factory that would utilize these dog fish and also the fish offal."

E. F. Hart & Company, Halifax, N.S.



THIS firm consists of Mr. E. F. Hart, manager, assisted by Mr. Gilbert Hart.

"Fish are not produced in this district," said Mr. Hart, "except at shore points. To increase

production we must increase the number of workers in the industry and educate them in modern methods of cure and in the utilization of fish by-products. I have always advocated the establishment of a central technical fishing school, conducted by experts in handling of fish. This could be supplemented by a travelling fishing school similar to the travelling dairying waggons in the butter and cheese business. I know that many young men would be glad of an opportunity to attend such classes.

"As a matter of fact the catching and curing of fish should be separated. We should have fishermen and fish curers. The fishermen should hand over their catch to the curers and thus all the catch would be standardized by going through the same hands. Fishermen should not cure their catch. They should be free to devote all their time to fishing."

Annapolis Branch—Robin, Jones & Whitman, Annapolis, N.S.



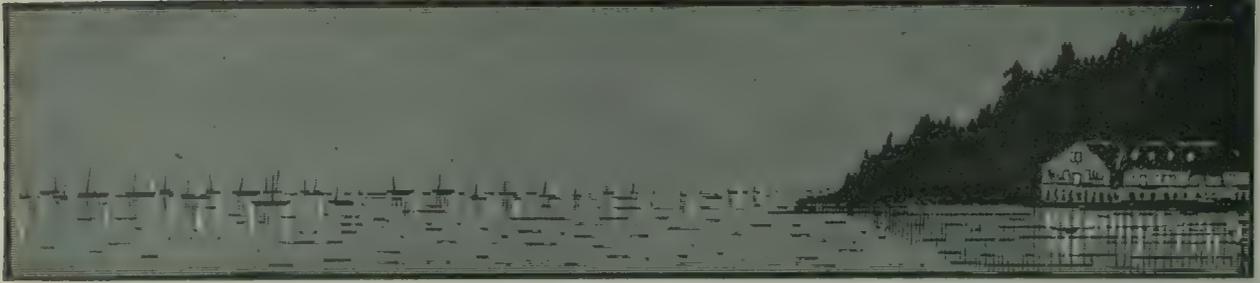
MR. F. C. WHITMAN, the agent of Robin, Jones and Whitman, Limited, at Annapolis, thinks that at the present time shore fishing could be quadrupled without interfering with price, as the present demand would easily absorb such a supply. "I favor personal inspection and instruction by competent men visiting all fish stations throughout the fishing season," said Mr. Whitman. "There are many kinds of cure required. Market conditions, the wants of buyers and the character and condition of the fish are controlling influences. Cures of cod vary according to where caught, method of catching and the market to which the fish are to be shipped. It is up to the fisherman to do the best he can. Local condition, supply of men and available outfits largely control methods.

"I would suggest the formation of a Maritime Fishery Board, which would deal with the various problems arising in our industry in the Maritimes. In order to increase production we must have more fishermen, but before encouraging an influx of foreign fishermen into our fishing population present conditions in our fishing centres should be considered. Our shore fisheries for the most part mean two men to a boat and a fleet of boats centering at a suitable station where sufficient fish can be collected and cured for shipment. Shore fishing needs a community of interest centered on fishing, with sufficient fishing or catch of fish to occupy the greater part of the year. Usually this is a close community, with intimate family relationship and knowledge of the immediate fishing grounds. An outsider would find it difficult to come in on the same footing. Needless to say the shore fishermen is opposed the introduction of steam trawlers.

"The increase or success of vessel and bank fishing depends on the supply of men for crews, and above all on the supply of fishing captains in charge of the vessels who know the fishing grounds, know their men, and have a community interest in the venture. Capital, vessels, wages, cannot take the place of and will not succeed against a fishing venture in which captain and crew are personally and directly interested in the vessel and catch.

"There need not be any worry about markets. This is a matter of collection and transportation. If the fishermen produce the fish the merchants may be depended upon to develop the market."

Mr. Whitman recommends the widespread collection of fish offal and dog fish to central reduction plants, for the manufacture of oil and fish scrap fertilizer.



A Navigation School For Fishermen

Nova Scotia's Encouragement to Ambitious Trawlers.

By the Editor.



WE have often preached the manifold advantages of a good knowledge of navigation in our fishermen and advocate it as one of the principal studies in technical education for fishermen. The Province of Nova Scotia has already made a good start in that direction with the Navigation School established in the Nova Scotia Technical College at Halifax.

The good work of this College under Dr. Frederick Sexton has long been celebrated in educational circles, and Dr. Sexton, himself, has created a enviable reputation for his labors in connection with technical education and vocational training for returned and wounded

enough to leave their work and attend a technical school for three or four weeks at places where they are established.

Dr. Sexton is of the opinion that the only effective way to carry out a course of technical education for fishermen, is to have travelling schools. The teachers should go from place to place and hold classes and lectures during the times that the fishermen are most likely to be ashore and able to attend. The classes should combine navigation, marine biology and practical exhibitions of the best manner in which to catch, pack, and cure fish. The present-day fishermen of Nova Scotia have shown, by the opinions many of them have



Nova Scotia Technical College.

soldiers. Interested, as he is, in all classes of industrial workers in Nova Scotia, the fishermen, one of the largest bodies of workers in the Province, are a class to whom he has given much thought in plans for their technical education in matters pertaining to their profession.

With the fishermen, however, such work is difficult. In the first place, they are scattered over a large area of country. Secondly, the nature of their work keeps them at sea for protracted periods, and they are only home at certain seasons. Thirdly, they are not rich

expressed, that they would be willing to attend such classes if they were established.

The college, of which Dr. Sexton is Principal, has established one class which is of vital interest to fishermen, and that is a School of Navigation. The school is located in the college and is well equipped with all the instruments necessary to instruct the student in navigation and such seamanship as can be taught ashore. The school has been very successful since its inception and the credit must be given to the skill and ability of the Instructor, Captain Jas. Simmonds.

It isn't every master mariner who can teach navigation to others successfully and intelligently, and while there are plenty of men who can practise the science, yet there are very few who can teach. Captain Simmonds has the happy knack of being able to impart his knowledge to others in a way that they understand and remember. He is patient, which is a necessary characteristic in a teacher, and he is a thorough sailor and experienced navigator, so that his explanations carry the conviction of long years of sea practice.



THE courses under Captain Simmonds' instruction cover the requirements for every class of certificate from Coasting Mate's to Master Mariner Foreign Trade, and it speaks well for his ability as a teacher to the many students who have passed through his hands that not one that

The course recommended for fishermen by Captain Simmonds is the Coasting Mates, which the student will be shown how to work a day's work, how to find the latitude by meridian altitude of the sun how to take a bearing by compass and determine the ship's position on the chart, and how to shape a course and determine the distance run from any given departure. In seamanship, the student will be taught thoroughly the rule of the road as applies to both steamers and sailing vessels, the regulation lights, fog and distress signals, use of the lead and log, etc.

The CANADIAN FISHERMAN and the Canadian Fisheries Association would like to have a teacher of Captain Simmonds' ability take charge of a travelling navigation school catering to fishermen exclusively. There is enough work in that for one man in South-



The Navigation School. Capt. Simmonds standing on the left.

he has recommended to stand examination has failed to pass.

Though the Navigation School at Halifax has been taken advantage of mostly by men aspiring to mate and master in coasting vessels, and second mate, mate and master in foreign trade ships, yet a number of fishermen have gone through the coasting mate's and master's courses. These have been mostly the bright young fellows of the Lunenburg fishing fleet who are all pretty good navigators on the whole and who take their vessels on West India voyages in the winter time.

Fishermen should take full advantage of this navigation school. The tuition is free, and all the students are expected to pay for is their own books, pencils and paper. Instruction is given to each person individually by Captain Simmonds, and they progress as fast as they are able. There is no time limit set upon the length of their studies.

western Nova Scotia alone. Taking that section for example, classes could be held in Lunenburg, Lockeport, Shelburne, Yarmouth and Digby during the year, and they would be well attended by those fishermen unable to go to Halifax. We have had the pleasure of seeing Captain Simmonds at work and of talking with men who received their training under him, and we feel sure the fisheries would benefit if he were enrolled as a factor in the work of technical education for fishermen.

"I intend to enjoy some piscatorial diversion tomorrow."

"Oh, professor, why do you want to bother with such highbrow things." Come with us on our fishing party." Baltimore American.

Who's Who, What's What, and Why

In the Fishing Industry of Lunenburg

By AGNES G. McGUIRE.



INCREASING production in the Fishing Industry is handicapped by several factors which other important industries do not have to contend with. Not only has it no governmental department which could be depended upon to carry on an Increase Production Campaign, but its greatest drawback exists among the very class it is destined to benefit, the medium wage earners generally, whose education from a fish eating point of view, has been sadly neglected.

It is as important to have an Increase Consumption propaganda then, as one of Increase Production, as it is appalling when one considers that fish has been an article of diet since earliest bible times, and yet so little is known of the various edible varieties and of the important part they play as life savers of the nation.

I do not mean that there is not enough of certain kinds eaten; there lies the wrong of the matter in a nutshell.

Too much attention is paid to popular varieties, and the waste of millions of pounds of good fish in our waters is little short of sinful. Therefore, an important point in the Increase Production Campaign will be to remove these foolish prejudices and to place all fish as food on a sane basis.

When it comes to a show down there will be found very, very few sorts that are not good to eat and that are not used in some country and esteemed a delicacy.

Fish That Can be Eaten.



THE vital importance of speeding up the fishing industry as well as all other channels of food production must be impressed upon the citizens of Canada.

The meat demand is depleting the supply at an alarming rate and people must eat more fish. If they hold this as a light matter they may find that the only solution to the scarcity of food problem that the future threatens, lies in the increased consumption of fish.

Through the popularity of some of the more aristocratic varieties, their price almost outdistances meat, but providentially the waters abound with countless sorts, nutritious and palatable, which not have yet been boosted by society and consequently may meet the leanest purse.

Suppose the average Canadian citizen were asked to a fish dinner at which the following varieties were placed at his approval: Sculpin, skate, cusk, monk fish, perch, grayfish or shark. No one need be at all surprised if he should "throw a fit," and I think I am safe in saying that he would decline all, without thanks at that.

Yet, should you call them by some other name, he would enjoy them immensely, and that goes to prove how much this prejudice amounts to. Simply nothing.

I know for a fact that huge sharks, weighing four of five hundred pounds are palmed off in some very swell cafes as scallops, on their unsuspecting patrons.

They are treated in this manner. Great steaks an inch or so in thickness are cut across the fish, then stamped out with a small cutter the size of the ordinary scallop. These when baked in scallop shells or scalloped in ramekins, defy detection.

Skate fins also masquerade as scallops. Shark steaks sold as sword fish find ready purchasers.

In foreign markets, squid, skinned and baked are esteemed a delicacy, and men sailing out of this port have eaten them and pronounced them good.

Each of the fish I have already named are eaten, and are for sale in large quantities in the fish markets in the United States to meet the tastes of the foreign population.

To prove how easy it is to remove prejudice, I may cite the case of the flounder, which up to a very few years ago was wasted in Nova Scotia, but which a Halifax merchant informed me recently was becoming much sought after. The only persons who bought it at first, were English people who had moved here. Now everybody wanted them.

There is also the grayfish, which now is an accepted food, and canned, has found a steady market, which proves that the chief thing against the much maligned dog was his bad name, and after the agitation about extermination it is truly amusing to think that the best way to exterminate him is to eat him.

But through these absolutely nonsensical ideas, nutriment of the most precious kind is being wasted.

People turn up their noses at sharks and dogfish because of purely imaginary habits. It is best not to inquire too closely into the habits of either fish or animals that are to be used as food. The controversies about the sought after and despised fish, on account of their habits, remind me of certain people who would like to be considered fastidious and who "just hate pork."

They affect to look with suspicion on pork as pork, because pigs are supposed to be dirty. But they will calmly eat ham and not bat an eye. Possibly they imagine it goes through a purification process with smoke.

They also are very partial to chicken and duck. As an experiment, let them turn out pigs, chickens and ducks together and see which will eat the most dirt.

So also some one who shudders at shark meat will eat eels, which are notoriously dirty feeders and will go into ecstasies over crab meat salad, especially if it is a nice high price, and the Lord alone knows what all crabs eat. In fact, our friend the lobster, whose rosy moments only occur when he's a dead one, is not supposed to be any more particular than he ought to be in his diet.

So, it is plain to be seen, that a demand must be created for hitherto despised fish and traditional foolishness must be swept away, and the masses must be educated to the belief that there are few, if any, varieties of fish in our waters that are not excellent food.

Medicinal Qualities of Fish.

THERE is another very important factor in making fish form a large part of our diet and that is its medicinal qualities.

Suppose the average person were asked why he ate fish? The answer in nine cases out of ten would be "Because it tastes good." Its food value as a muscle, fat and flesh builder is not considered, and it is only because of a conscious craving that he unconsciously ministers to the wants of the body.

In the human race, the admirable stability of the body is maintained by the action of the wonderful ductless glands. Two of these most important factors are the secretions of the adrenal and thyroid glands. The absolute necessity of adrenalin for the human

Lunenburg, and if I do it with pardonable pride it is, among other reasons, because I recently heard it quoted at a patriotic meeting, as the wealthiest town for its size in the Province of Nova Scotia, possibly the wealthiest for its size in the Dominion. What is the basis of this wealth, this prosperity which is Lunenburg's goodly heritage?

I am proud to state that it is the fish trade and fishing industry, which from a once despised position has forced its way to the very front ranks of the important industries of the world.

From a perhaps somewhat biased viewpoint I cannot see how the fishing industry can be regarded otherwise than really the most important of all the world's industries, for the reason that it has developed



Fish Drying at Lunenburg.

system is only equalled in importance by the thyroid secretions which are vital to life.

Space forbids the detail of this matter, but the point to consider here is that an absolutely essential part of the thyroid secretion is iodine, that is, the secretion itself contains that matter. From what source does this marvellous gland obtain the material which it elaborates into an iodized secretion? From food, of course, and in preparing the daily menu, the wise housekeeper will do well to give fish a prominent place, as a large percentage of iodine is found in smoked herring, fresh cod, salmon, trout, tunny, eel, anchovy, gray shrimp, whiting, bream, crab, oyster and lobster.

Thus, it would seem that the most potential of all arguments has been advanced for fish, when in addition to being a palatable food it is one of the most important regulators of the body and is really indispensable to the human race.

Lunenburg's Fishery a Wealth Bringer.



THERE is still another side to consider and that is the commercial side of the fish question and that brings me to the point that I have been rather modestly working up to for some time, for it gives me an opportunity to introduce

to almost gigantic proportions, yet its limit is nowhere in sight.

Development but means greater production; the more men engaged in fishing the greater the harvest. It is, therefore, worth infinitely more in economic values than any other resource, because the supply is practically inexhaustible. But some one objects, that may also be said of farming, mining, lumbering, etc.

The importance of farming no one would attempt to belittle, but it has setbacks in the shape of drouth, frost and floods, to say nothing of the armies of insect pests which lie in wait for the newly grown plants, all of which can blast a season's labor, and are the curses of agriculture, yet they hold no terrors for the fishermen.

Again in the case of lumbering, fire can sweep a million dollars worth of valuable timber to blackened ruins and if that is not experienced, continuous cutting at a certain section means depletion and the forest has to have a chance to rest for renewed growth. This is especially so in Nova Scotia, where conservation of the forests is not carried along scientific lines, entailing enormous waste.

Mining often demands costly engineering or the building of long stretches of railroad for its development, and in the case of gold mining in many parts

of Nova Scotia there are thousands of dollars worth of expensive machinery rusting into scrap iron, which was bought for mines whose prospects were rosy enough in anticipation, but which petered out to the dreary realization of utter failure.

These vast sums of money, invested in staunch bank fishing vessels, would have been paying big dividends and would have been a sane and steady source of prosperity. Wild cat schemes of sudden wealth appeal more strongly to man of the fine coat, his nose tilts skywards at the thought of fish.

However, one has the satisfaction of knowing that supercilious airs affect the fishing industry not one jot, it forges steadily on to recognition and distinction.

When considering the value of any industry, it is the future, more than the past or present that really counts, and surely no one is so blind as to deny the vast possibilities the fishing industry holds.

The waters teem with fish in 1917; they will teem with fish until the end of time as they have since the beginning of time, and with the assurance of an abundance to draw from, all that is necessary to consider is the extension of the industry.

The year 1916 was a big year for Lunenburg, the cargoes sold netting \$1,635,505, and there is every prospect of 1917 being equally successful, as many of the bankers secured good catches on the early spring trips, the demand is great and the prices high.

Last year there were over one hundred vessels engaged in fishing, this year there are a number less, owing to sales and losses, but there is no reason why there should not be three or even four times as many vessels prosecuting this industry.

The argument has been advanced, that it would not be possible to get hands enough to man such a fleet.

I will refute that argument by the statement, that after the schooners were equipped this year, there were one hundred and eighty applications for berths which could not be granted.

How many more could be secured if there were a known need, I will not attempt to estimate. The applications came from Pubnico, Argyle, Arcadia and other places in Yarmouth County, as well as from men in Gloucester, who, tied up by the big strike, were anxious to get employment in Lunenburg.

There is not a doubt that many of the men engaged in fishing out of Gloucester would return to their native province, should there be any call for extra men, as those who have tried it are well satisfied.

Last year Captain Lewis Wharton brought a crew and fished out of this port. When it came to settling the trip the men were so pleased with their treatment they decided that Lunenburg was the place for them, and one member of the crew was so astonished at the size of his check, that he thought a mistake had been made, as it was fully one hundred dollars in excess of his previous earnings or expectations.

Fishermen of Good Character.



A WORD in passing, regarding the tributes paid these young French fishermen in the outfitters' stores.

Lunenburg is a conservative town, and does not warm quickly to outsiders, but on all sides there were words of praise for these young men and one or two instances of their scrupulous honesty were related.

In one case a pair of rubber boots had been purchased, and when the owner started to haul them on he found a valuable piece of fishing gear in the boat,

which he at once sent to the owner. Another young fellow found he had been charged with only one suit of oilskins instead of the two he had bought. He immediately sent the money to the firm calling their attention to the omission.

Incidents such as these from non-residents cannot but attract the outfitters notice and create a favorable impression, so that any time there is a vacancy in the fleet, the D'entremonts, Doucettes, Landrys, etc., are sure of a berth. They are liked by their ship mates and are regarded as fine chaps on all sides.

The young fellows from our own country who man the fleet, are a fine type of whom too much good cannot be said.

Their bravery and general good qualities make up a class that is hard to equal, and don't let any one fool himself into thinking that any dub can be a successful fisherman. From the time the mere lad goes aboard as a "throater" or "header," his one ambition is to be master of a schooner.

This, of course, will depend solely on his industry and ability.

A good captain must possess sound judgment, be able to handle men, no mean accomplishment, as many a one has found to his sorrow; have a keen knowledge of business, understand a certain amount of navigation; possess intuition as to the whereabouts of the elusive cod, and be competent to handle the thousand and one emergencies that arise from the months of March to September.

The first trip is made about March 15; the second about the 15th of April. On returning from that, about the first week in June, they sail about the 8th or 10th of June, getting home about September 15.

Let no one think that the big dividends paid by the Lunenburg fleet are earned on "flowery beds of ease."

The land lubber who sees the cheques paid to the men, when full fares are sold at big prices are apt to talk of "easy money," but there is very little easy work in the life of a fisherman.

There are probably few men who prosecute their calling under such "distressful circumstances" as these brave chaps, whose adventures on the spring bank trip would fill a book.

During the months of March, April, and even May, the freezing blizzards make hauling trawls "some hazardous."

On the land the spring zephyrs have moved poets to verse, on sundry occasions, but I doubt if these piercing gales swooping down on a cockle shell of a dory, tossed about, now on the crest of a mountainous wave, then in its trough, bobbing about like a cork, could inspire much poetry in the most ardent sentimentalist. Splash! The spray flies, freezing as it falls, and the men with numbered fingers bend to their oars and endure it as best they can. Then again, a blinding, bitterly cold fog swirls down on them while the men are tending trawls far from their schooner.

Terrible tales of suffering are told of men who have taken the wrong direction and rowed for days suffering hunger and thirst, before they were rescued.

Then the ocean tramps, with little thought for the small fry of fishing schooners, which may be in their path are a constant menace. Men have been drowned like rats in a trap, when a steamer has crashed into an unfortunate trawler, cutting her practically in two so that there was no escape for the poor lads who lay in their bunks asleep, or who, if awake, were powerless to help themselves.



HAIR raising are the tales of narrow escapes when a steamer shaved the schooner's rails in passing, and it was over so quickly, that nothing but the discordant screech of her whistle gave a sense of reality to the night mare.

The captains of the schooners have many bad hours, when their arch enemy, the fog, settles down for a prolonged spell, and the men all loathe the fog above every other kind of bad weather.

There is something so baffling and weird, in trying to detect danger, hearing it, feeling it, sensing it, yet not being able to see it, and the men who accomplish their ambition and become skippers of the fleet, carry heavy burdens of worry while the fog lasts.

Yet there are none so light hearted, as the men of the fishing fleet. When danger is over they philosophically refuse to fish over past dangers or consider future ones.

"A miss is as good as a mile, they decided and as their daily fare is heroism and peril, they go about their work cheerfully and are as optimistic a bunch as you would wish to meet.

They also receive an extra commission of $1\frac{1}{2}\%$ of half of the total stock, which is paid by the owners.

The first credit in settling is fish oil, and halibut; the first charge, bait, then fish drying and cost of delivering; master's commission; headers' and throaters' wages; oil barrels and water dues. These amounts are deducted from the gross receipts of the trip.

After this deduction, one half of the net proceeds go to the crew, who pay cooks' wages, medicine, gasoline, and a percentage for use of engine.

The other half goes to the owners, who pay provision bills and all outfitters' costs, such as dories, lines, etc., etc.

The vessels are divided into 65 shares, of which the captains own from 1-16 upwards, other shares being divided among merchants, other fishermen cooks, etc.

With captains who have the reputation of being lucky it is almost impossible for an outsider to buy a share, as the same persons take shares over and over.

The prices for outfitters' supplies have practically doubled in price in the last ten years. A vessel, for



Vessel Building in Lunenburg.

They are fairly sure of big prices for their summer's work, their schooners are as comfortable as most, their grub is better than the best, and they make the best of everything.

Outfitting the Fleet.



The Lunenburg fleet is operated and outfitted differently from probably any other.

Each trip is settled as soon as the cargo is sold.

The method of settling is like this. The captains get $2\frac{1}{2}\%$ of the returns of the trip, half of which is paid by the owners and half by the crew.

instance, that cost \$4,500 at that period, runs now to \$8,500 or \$9,000 at the yard.

When ready for sea, she stands worth some \$14,000.

Dories cost about \$21.50; 280 fathoms of hawser about \$1,470; anchors \$60.00 each. Vessels carry two of these and a club anchor with 60 fathoms of chain rus to \$300. Salt costs about \$850.

Sometimes in a big blizzard in early spring a vessel loses her dories and part of her gear. From the foregoing figures it will be seen that such losses tell heavily against the dividends.

Bait bills are another big expense item. There are

captains who jig their own squid for bait and consequently their bills are very light. Others have bait accounts running from \$1,100 to \$1,800.

Some of the hand liners use no bait, and have no charges of that sort, which must be a great relief when settling day comes.



THE H. C. of L. made apparently little difference in the "grub" outfit this year, although it was considered wise to try to curtail the extravagance that had obtained along those lines in past years.

An attempt was made by the owners to fix a schedule, but the men rebelled and apparently things are as usual, as if one or two items were cut down, something else equally expensive was substituted.

An exact copy of a grub outfit account is submitted which proves clearly that the men have little to complain of.

The bill amounted to \$671.61 and provisioned the schooner for three months.

Food account: 4 bbls. extra plate beef; 1 bbl. pork; 160 lbs. lard; 175 lbs. creamery butter; 6 bags sugar; 122 lbs. pilot biscuit; 5 bush. beans (\$7.50 per bush.); 50 lbs. raisins; 3 cases canned peas; 3 do. string beans; 2 do. corn; 1 do. pumpkin; 1 do. blueberries; 1 do. peaches; 1 do. strawberries; 1 do. clams; 50 lbs. evaporated apples; 2½ cases condensed milk; 25 lbs. dried green peas; 3 lbs. cocoa; 2 lbs. chocolate; 2 lbs. hops; 60 lbs. onions; 4 buckets jam; 2 packages macaroni; 6 lbs. cornstarch; 16 lbs. baking powder; 6 lbs. cream of Tartar; 20 lbs. rolled oats; 6 lbs. soda; 20 lbs. tea; 30 lbs. coffee; 15 lbs. rice; 15 lbs. barley; 6 bottles French mustard; 26 ozs. lemon; 26 do. vanilla; 20 lbs. tapioca; 2 doz. bottles Worcestershire sauce; 3 doz. do ketchup; 24 gals. molasses; 9 bbls. flour; 6 packages cream of wheat; 9 bushels turnips 40 bushels potatoes; 30 doz. eggs; 1 lb. nutmegs; ½ lb. ginger; ½ lb. cassia; 7 lbs. pepper; 1 lb. mixed spice; ½ lb. allspice; 1 lb. cloves; 2 lbs. seasoning for dressing.

In addition this cabbage, pickled beans and sauerkraut are also laid in and with a continuous supply of fresh and pickled fish, there should be nobody hungry.

Eggs, which some schooners carried as high as 60 dozen, cost 35 cents a dozen and potatoes which are now being bought for the summer's outfit are costing \$1.50 per bushel.

The farmers of this county selling direct to the outfitters, with no middle to contend with, have no kick coming.

More Education in Fish Handling Needed.



THE method of trawl fishing as carried on by the Lunenburg fishermen has been described in the **Canadian Fisherman** so often, that it is not necessary to take up space with that detail.

But, perhaps it will not be amiss to emphasize the need of more care, both in salting on board the schooner and curing.

The substance of the matter is, that the demand at present is so great for the cured product, that our fishermen have never really had to face great competition with products which would swamp their output, consequently the trouble is not taken necessary to ensure a perfect result.

The real story of a badly cured fish often begins aboard the schooner, although a careless fish maker

can put a jinx on a good clean cargo of fish, by washing them in insufficient water.

This leaves a deposit of slimy matter on them, which is not so apparent when dry, but when these fish come to be shipped to a foreign market, and start to "sweat", they arrive at their destination, unfit for food.

When the fish are tossed from the dories, on board the schooner to the dressing crew their duty is to split them, wash them, throw them in the hold and salt them in kenches.

The proportion of salt used is generally 15 hogs heads to 100 quintals, and irregular salting can ruin the best fish that ever swam.

One captain of the fleet is spoken of as the most "fussy" man in this port.

He insists that all work shall be done properly, and is extra careful about the salting.

No slack salting of one lot, and another quantity fairly burned up with the excess of salt that is thrown in at random.

Then they must be piled right. If they are not, hollows form in which the pickle collects and heats, burning the fish an unpleasant red.

This captain knows that there are only two ways to do things, the right and the wrong way, and he insists that his work be done right.

When his cargo is delivered to the fish makers, they have excellent stock to work on and when the cured product comes to the market every fish is up to the mark.

Many fish makers take pride in their work, have pumps attached to their buildings, use plenty of clean water and take every pains to turn out an excellent article, but there should be no question of some delivering good stock and others not. In an important industry like this there should be no imperfect stock. The essential is cleanliness first, last, and always.

The fish should also be allowed a longer time in the "sweat" pile, and then they should be thoroughly sun dried, the backs being exposed to the sun much longer than the faces.



THE only remedy for the evil of improper curing is a Dominion Inspection Act, and those interested should insist upon its being passed as it seems ridiculous, that any portion of the biggest money getter in the county, should get a black eye through inefficient handling.

Technical training for our fishermen and fish makers is suggested as a way out of the wrongs that obtain at the present time. The Board of Trade of Newfoundland has already taken this matter up.

The old theories of blaming Providence for potato blight, etc., are luckily left far behind, and the farmer applies his knowledge gathered at Agricultural Colleges and from short courses in the country, to combat pests and garners big harvests where once there was vain labor.

I read an article written by a Yarmouth fisherman recently which shows that many of the fishermen themselves realize that they are handicapped by lack of technical education. The letter made such a strong impression on me, I take the liberty of reproducing it.

"The National Service meeting to promote 'food production,'" held here (Yarmouth) last week, laid stress exclusively on farm and garden work, and the

speakers seemed entirely unaware of the fact that Yarmouth's interests are those of the sea, and that it is an important centre for our great provincial fishing industry.

Is there to be no recognition of fish food production in this National Service movement? It may be said that the soaring prices furnish sufficient stimulus for increased production, but the same is true of the farmers' products.

I thought when I heard the Principal of our Agricultural College making arguments and suggestions for farm and garden development, that it was time we had a Maritime Fishing College for the express promotion of our fishing interests. Professor Cumming shows the need of legislation, and a slogan against eating veal. But what ignorance of politicians, inspectors and fishermen has allowed the veal lobster to be destroyed by the million and with them the food supply so valuable to-day. This by the way of example.

Then again is it not worth while to emphasize the value of fish offal and kelp for fertilizers which play such a large part in land crop production.

Cannot the National Service have some word of counsel and wisdom for the larger and better production of fish as food in this critical period of high living?

Whether that article was written by a fisherman or not, I do not know, but at any rate it is largely co-incident with the ideas contained in this article and perhaps if hundreds of such letters were published, the need for a fishing school would be made clear.

When it is considered that at the last provincial exhibition in Halifax the fisheries building did not have even a fish's tail in it, it would seem that there's a big need somewhere.

The magnificent building provided by the Government has every facility for displaying all kinds and conditions of fish, and it is not too much to say that it is shameful for this industry to be represented by a minus sign. If the fishing industry should fail in all the towns in Nova Scotia, which depend altogether or largely on it for their prospering, there would be no end of lamentation; the calamity would be bewailed to the skies, yet those interested do not show their appreciation of it, by sending one sign of it even, to the provincial fair. Can that be said of farming or mining? So, perhaps it is a technical school that is needed to teach admiration if not appreciation of our king industry.

The Norwegian fishermen all have to attend fishing schools and the fish makers as well, and poor work is not tolerated in that country.

Education is a slow business. Yet if our fisheries are to increase after the war and our industry is to be held against the real competition which will then obtain, the standard will have to be raised.

To-day vegetable, fruit, meat and other foodstuffs have to be good. There is no question of one lot being good, and the next bad, no poor goods are accepted. High prices are paid and the articles must be up to the mark.

Sooner or later that rule will also apply to the fishing industry; wrongs will be righted and losses from cargoes spoiling on passage to foreign markets will be unknown.

Do not gather from the foregoing, that inferior fish are the rule in Lunenburg, for they decidedly are not, but there should be no bad fish, all things being equal and proper care being taken of them from the time they leave the hands of the dressing crew, until they are delivered dry to the fish merchants.

Some time ago there was an article going the rounds of the press to the effect that nothing but poor grade fish were shipped from Lunenburg to Porto Rico. This is absolutely untrue as I will prove later on.

Zwicker & Co., Ltd.



THE oldest fish firm in Lunenburg, that of Zwicker and Company, Limited, has been shipping to this market for over half a century, and so highly is their stock (shipped in sailing vessels only) appreciated by Porto Rico buyers and so excellent is it considered that these buyers often wait a week or more for the arrival of their vessels to secure their cargoes. Although this was not intended for publication, I cannot help using it as further proof of other consignees' assurance of good stock arriving.

The letter was from a merchant in Havana, and stated that the consignment of fish had arrived, and though the buyer had not yet seen them, he was quite sure they were O.K. That seemed to me a very excellent testimonial and positive proof that he must have had strong faith in the shippers.

The firm of Zwicker and Company has maintained an unbroken business record since 1789.

John Zwicker, who started business in that year, had prior to that time been a partner in the firm of W. & M. Rudolf.

This firm wound up its affairs in 1788, and the next year, John Zwicker began business on his own account as a general and West India merchant, shipper of fish, lumber and staves to the Windward Islands and importer of molasses, sugar, coffee, tobacco and rum. These imports were chiefly sold at Halifax, and in spite of what, to modern ideas, would seem limitations of opportunity, the old ledgers of the firm show that he at one time owned twelve full rigged brigs, two ships and several schooners.

At his death in 1841, his sons Edmund and Nicholas took charge and the firm name was changed to E. & F. Zwicker, but both men died in 1859, and their younger brother William N., assumed control of affairs, having in partnership with him John M. Watson.

At the end of ten years, Mr. Watson retired and moved to Halifax and W. N. Zwicker carried on the business alone until 1881, when his eldest son, Arthur H. was admitted as a partner.

In 1904 two other sons, W. Norman, and E. Fenwick, were also admitted, and the firm became a limited stock company.

Zwicker & Company were the very first to outfit vessels for trawl fishing and this year their outfitters' list includes 21 trawlers and handliners, beside what is known as the "mosquito fleet," some 16 in number, which operates on the north side of Prince Edward Island.

In speaking of the Lunenburg fleet, the local habit is to speak of the vessels that outfit with each firm, as that firm's vessels. For instance, if you were asked whose schooner is the "Elsie M. Hart," you'd say at once, Zwicker's.

But if you said the "Glacies" for example, who outfits with the Smith firm was a Zwicker vessel, you'd be corrected at once. And so with the vessels outfitting with each firm. It doesn't mean that the firm owns the vessel, but is a local method of distinguishing them.

The fishermen are very jealous of the reputation of the firms they outfit with, and are very exacting about the credit that each firm gets, and you'll be set right in a jiffy if you assign a schooner to the wrong outfitter.

So that, with few exceptions, the outfitters are not sole owners, but neither does it mean in the case of Zwicker and Company, that their holdings are represented alone in what is called their fleet, as they own numbers of shares in other Lunenburg schooners as well as several in Halifax.

In past years, their outfitting fleet was considerably larger, but several schooners have been sold since last year, among them being the "Edith Marguerite," "Falka," "Mayola," "Artisan," "Elsie Corkum," "Mattawa," and "Marion Silver."

The tern schooner "W. N. Zwicker," was also sold and tern schooner "Blandford" and the "F. M. Toro" were lost.

The handsome new tern schooner "Hillcrest," one of the finest models ever built here, and the new bankers, the "Edith Newhall," Captain Eldridge Spindler; "Asquith," Capt. Sarty; "Hazel Herman," Captain George Herman, and the "Doris L. Corkum," were all added to the fleet within the past year.

Zwicker & Company claim to be the only firm in the West India trade, that regularly ships fish in sailing vessels and they continue to do their own freighting, with a surprisingly fast service.

They have five schooners engaged in this service, some of them making marvellously quick trips. By this method of transportation there is no expense of transfers, and no extra loss by many handlings.

A record trip was made recently by the schooner "Lloyd George," Captain Gabriel Himmelman. The vessel went to Ponce, discharged her cargo of fish, proceeded to Turk's Island for salt, loaded her cargo and was home, covering the round trip in 27 days. She also made four trips in 121 days, this time covering her sailing and discharging cargo abroad.

The brig "Sceptre," some years ago made a trip from Lunenburg to Mayaguez and return in 25 days, and a run from Lunenburg to San Juan in seven days.

While fish shipped to Porto Rico are carried in the firm's vessels, large shipments are made to Cuba, Hayti, Jamaica, Trinidad, Guadaloupe and Demerara.

These cargoes go to Halifax where they are shipped by Royal Mail steamers, or to New York, where they are carried by the United Fruit Company's and other steamers.

During the past winter, big shipments were made via Yarmouth to Boston, where they were shipped to various destinations by steamers of the United Fruit Company.

In the year 1896, 1897, 1898, 1899, shipments as high as 80,000 quintals yearly were handled by this firm.

Probably no other firm in Nova Scotia is better equipped to handle bank fish as they have the largest fish dryer, outside of Halifax, in Canada, installed in their store.

It is capable of drying 300 quintals a day, having 572 flakes, each 10 ft. long and the finished product is most satisfactory. It was installed in 1905 and has paid for itself many times during that period.

There is no need of worrying about the weather, the work goes steadily on, rain or shine, and at one time, from fall to the following April, the number dried was 17,000 quintals.

Since the war, there has been a revolution in the fish trade of this firm, in regard to competition with Scottish and Norwegian cured fish.

Alaska has been a strong factor in bidding for a share of trade.

The Alaska fish are much harder than the Lunenburg product. The normal Alaska fish has about 25 per cent of moisture taken out of it, and they are all dried in patent driers.

To compete with these, Zwicker & Company's consignees demanded an extra dry fish and after experimenting, it was found, that an additional 14 per cent of moisture must be taken after sun drying for the fall drying, and 4 or 5 per cent for the summer dried stock, to make a product equal to meet the Alaska stock. These latter fish are all "white napes," making a far more attractive looking article when cured than the Lunenburg fish, a feature the Lunenburg bankers would do well to make a note of.

It is estimated that these (white naped) fish are worth 35 cents per quintal more, and though many of the fishermen can't see it as yet, if that is the class of fish demanded, that is the class that will have to be marketed.

The records of the firm of Zwicker & Company are of much interest. There is the firm of S. P. Musson & Company, of Barbadoes, with which the ledgers show they have traded for over a century.

The late W. N. Zwicker died November 4th, 1912. He was 93 years of age, and although in his latter years, he did not take an active part in the affairs of the company, he took the greatest interest, until the end, in the business in which he put all the energy of his younger days.

The name of Zwicker has been so indissolubly associated with the fish business of the town for the past 125 years, that it would be hard to imagine Lunenburg without it prominent in the fishing industry. It is to be hoped that in these days of mergers when the names of old established firms are so fast disappearing one by one that the firm of Zwicker and Company which has existed so honorably for so many years will not lose its identity.



W. C. Smith & Company, Limited.

THE firm of W. C. Smith and Company is one that has attracted considerable attention in the fishing world since its incorporation in 1899 with five Smith brothers among its stock holders.

Though a mere baby, so to speak, in the business world, the business has grown so rapidly and its progress has been so steady that from its modest start only a short time ago, it has advanced to being known as one of the most successful firms in Nova Scotia.

Some years ago four of the Smith Brothers, James G., Abraham, William C., and Benjamin were sailing fishing vessels and even then "The Smiths" were recognized as men who could be depended upon to catch fish if there were any going.

The Canadian Fisherman at one time published an

account of Captain Benjamin Smith's trip in 1913 when his schooner, the "Gladys B. Smith" divided \$9,000 among her owners.

The Smith brothers started in business with six vessels, and each of them was known as a lucky one. In 1909, as their business was extended, a three storey warehouse was erected for fishing supplies, the top floor of which is used as sail loft. Some time later, an adjoining property, including a ship yard and boat-house was acquired, and in 1913 the general outfitting store was enlarged to double its capacity, and the Company's offices were extended and fitted with handsome furniture and modern equipment.

The water frontage of this firm now covers an entire block. For the year 1917, W. C. Smith & Company have outfitted 24 trawlers and handliners.

In 1916 there were 29 bankers and three large freighters on the outfitting list. Since that time the schooners "James Burton Cook," "Assurance" and "Benevolence" were sold; the schooners "Lucile Schnare" and "Doris V. Myra" lost, as well as the tern freighter "H. R. Silver."

Three fine new schooners were added to the fleet this spring, the "Lucile Schnare No. 2," for Captain Artemus Schnare; the "Alicante" for Captain Milton Romkey, and the "Glacier," for Captain Lemek Knock.

The Smith brothers are noted for their close attention to business and the success of the firm to a large degree is due to its careful management.

The youngest brother, Lewis H., looked after the office affairs for a number of years, but failing health forced him to retire from the firm and engage in out-of-door employment.

The Smith fishing fleet engages in freighting in the fall and winter in part, others carrying cargoes overseas in the export fish trade.

Their vessels follow the fishing to Newfoundland and all the sea areas off the Atlantic Coast of the Dominion where ocean fish are obtained.

The wharf of this firm is one of the busiest in the spring and for several weeks their store is a scene of frazzled strenuosity as each skipper wants to haul in and be outfitted first.

A feature of the firm that cannot but impress outsiders is the loyalty of the skippers who sail in this employ.

There is a spirit of camaraderie between the members of the firm and those sailing for them that is noticeable to the most ordinary onlooker, and it is certainly productive of reciprocal good will.

There is a certain open-handed generosity when settling day comes; there is always a cigar when the skippers call and the odd dollars on account are evened up in such a satisfactory manner to the master of the vessel that he tries to impress every one with the idea that his is the best firm in the world.

This is as it should be, because each man that he talks to, is sure his particular firm is the best, so it does no harm whatever.

Captain E. C. Mack, of the schooner "Vivian P. Smith," sold his spring cargo green to the Parkhurst Fish Company, of Gloucester, at the rate of \$9.00 per quintal dry, for cod, and \$7.00 per quintal dry for haddock.

The demand for green fish is big and a number of agents for different firms were here in the early spring to snap up cargoes.

William C. Smith, President of this firm is a member of the Fishery Advisory Board of Canada.

Robin, Jones and Whitman.



AN industry that contains probably as great possibilities of increase as any in the Dominion is the Boneless Cod business of Robin, Jones and Whitman, whose factory store and offices are situated at the extreme eastern end of the town.



Capt. Christian Iversen and his son, Captain Kenneth Iversen.

This business, formerly known as The Atlantic Fish Company, was taken over by Robin, Jones and Whitman, of Halifax in 1906. At that time and until 1911, William Duff, now president of the Lunenburg Fish Company was manager. When he retired he was succeeded by the present manager, Captain Christian Iversen.

A trip through the boneless cod factory is of much interest. Surely the motto "Cleanliness is next to Godliness," must be strictly observed here, as the place is ideally clean, and the fish in various stages of having their bones extracted, look good enough to eat raw.

Since last year the demand for this product is enormous. Before the war, trade was steady, at time brisk, but it has simply jumped ahead in the last twelve months, and that this firm will be heard of along the lines of greatly extended business within the next few years is a safe prophecy.

Shipments of their excellent product have been made direct to Australia, also to Toronto, where the T. Eaton Company and the Robert Simpson Company are large purchasers, although the F. T. James Company of that city are the biggest buyers.

The fish are put up attractively in conveniently sized wooden boxes; the "Halifax" and "Acadia" brands being cut from the thickest and best parts of the cod.

These slabs of pure white solid food, free from bone, offer a solution to the problem of keeping down expense, to the housekeeper, for though this brand is not cheap, every portion of it can be used; there is no need to waste a particle.

Other well known brands put up by this firm are: Bluenose, Pilot, Skinless Shredded, Nova Scotia Turkey and Micmac.

The "Halifax Shredded" product is for fish cakes and hash and is put up in nice cartons, giving directions for preparation in a few minutes. This is another good food with no possibility of waste in cooking. The fish used in the factory are shore cod and green cod brought from the Gaspe Coast.

Owing to the situation of the store, the cargoes can be most conveniently handled. From the rear of the second story a pier runs out, covered with wire flakes, on which the green fish are dried for manufacture.

The firm's vessels bring salt, which is hoisted up to this pier and easily placed in the store. A huge windmill pump carries 4,000 gallons of water to a tank to use for washing fish and in case of fire. The fish are shredded by electric motors and light is furnished throughout the building by their own dynamo. But if the electric light plant of the town could furnish a day as well as night service, a box factory would be put in operation, and it is up to the town to meet the need of this growing business.

At present \$12,000 worth of boxes are used yearly. These are furnished by J. F. Mackey, of Northfield, the shooks are brought to the factory where they are made up as needed.

There is no doubt that a box factory would give employment to a large number of persons, and it would seem that the demand for this class of food will in a very short time be far in excess of the supply. There should be steps taken at once to increase the output and to establish a box factory.

One city alone in the United States will furnish orders sufficient to keep the hands busy for a year, to the exclusion of their other customers, if the firm wished to accept the offer.

Every portion of the fish is utilized at the factory; a market is found for the skins at the glue factories and the farmers use the refuse for fertilizer.

The Maritime Fish Corporation are the selling agents of the company in Montreal and Quebec.

The firm of Robin, Jones & Whitman, outfits a number of vessels although this year between sales and losses, the number has been reduced to ten.

The handsome new tern schooner "Perce," owned by this firm, fell a victim to the Huns on her first trip.

The schooner "Mark A. Tobin," sailed by Captain Kenneth Iversen, was lost a few weeks ago on Sambo Ledge, on passage from Halifax to Barbadoes, with a cargo of sugar and molasses. Captain Iversen, who is a son of the manager of the firm, made his first voyage as master when a little over 20 years of age, and was probably the youngest captain to foreign ports, who ever sailed out of Lunenburg. He went from Bridgewater to St. Kitts, carrying a return cargo of molasses to Halifax.

This was his fourth voyage and genuine sympathy is felt for the boy master who, having navigated his vessel from Barbadoes to almost the end of her destination, should be sacrificed to the unfortunate circumstance, which demands that all lights be out along the coast at a certain time.

It is no reflection on anyone's skill as a navigator, as ships are being piled on the rocks in other countries from the same cause, and the captains have to console themselves that it is necessary to lose a few ships to save the greater number.

Navigators usually are considered to do well, when having weathered the hardships incumbent on almost any foreign voyage, they run for a light and make their port, but expected to find a light and none appearing, there can be nothing expected but disaster for the ship.

John B. Young.



THE fish firms of Lunenburg, have with one exception, "and company," on their signs, or have several interested in the business.

The exception is John B. Young, one of the most successful men of the town, and one whom the other fish merchants speak of with marked respect, for John Young had no help in his business from partners, and when he met a loss he met it alone. To-day he is regarded as one of the wealthiest men of the town and his business is considered as solid as a church.

For twenty-two years Mr. Young was with the old firm of J. D. Eisenhauer and Company, and in the year 1894 he started business for himself. He owned a number of shares in the fishing fleet, and as his business extended he built a number of vessels in the ship yard on his own premises, back of his store, for his own banking and freighting trade. These schooners were built by the veteran shipbuilder, Stephen A. Morash, and were solely owned by John B. Young. Several of these have been sold from time to time. The tern schooner "Mary D. Young," another of Mr. Young's vessels, probably the only schooner of her class engaged in trawl fishing, is sailed this summer by Captain Roland Knickle.

The schooners "Earl V. S.," and "John B. Young," are engaged in freighting and are also the property of Mr. Young, having been built in his yard.

For several years Mr. Young gave up building

schooners, but in response to the great call for tonnage he contemplates putting in machinery and building other ships this year.

The salt bulk and frozen herring trade has always greatly interested Mr. Young, and his schooners have gone to Newfoundland in that business for many years. He owns a large store, handling flour, feed, salt and ship chandlery, beside having an extensive coal business. His property in Newtown is one of the finest in Lunenburg and the success which has crowned his efforts is recognized as due to his shrewd business ability



Mr. John B. Young.

and absolute integrity in all his dealings.

John Young's word is as good as his bond, and though it would be hard to find a man of more modest demeanor and quiet life, yet it must be conceded that his attainment is the result of his own unaided effort and due to his own brains and business capacity.



The Lunenburg Fish Company, Ltd.

THE Lunenburg Fish Company has been in business for five years and carries on an extensive trade in dry and pickled fish, handling in an average each year about 4000 quintals of dry cod, haddock, pollock and hake, and 4000 barrels of mackerel and herring. They also purchase kench fish and dry them on their premises. They transact business with firms in Boston, New York, Porto Rico, Hayti and Trinidad.

This company at the time it was incorporated, purchased the premises of James Eisenhauer and Company, which are centrally located in the town.

The manager of the company is Mayor William Duff, who has always taken a keen interest in the development of the fisheries, and is at the present time, the

largest owner of fishing and coasting vessels in the country, holding shares in a large number of the lucky bankers.

Mr. Duff is an enthusiastic advocate of "white nape" fish and should these fish be the rule in Lunenburg instead of the exception, quite a bit of credit will be due him for his efforts to interest the fishermen in the advantages accruing from this method of curing. Last year, when it was impossible for the Norwegian fish to be shipped into Cuba, he saw the opportunity for a new market for the Lunenburg product, and he wrote to the fishing captains urging them to white nape and clean the blood from their fish, so that their fish could be prepared for this important market. A few of the captains responded to this advice last year, and this year he believes that a great many more will adopt this method as they will bring a far better price than the ordinary cured fish.

He has also strongly advocated for a number of years, the idea of the vessels disposing of their catch immediately on their return from fishing, instead of first drying their fish and then selling them, as if the fish were sold green, on the arrival of the vessel, the captains and fishermen would at once get the amount due them for their share, and it would have a marked effect in stimulating the industry.

If the fish were purchased in this manner the merchant who bought them would then be able to have them made to suit the different markets, and consequently a new era in the fishing business would be inaugurated.

J. Ernst & Sons, Limited. Mahone Bay.



THE firm of J. Ernst & Sons, does a large general trading business at Mahone Bay, a seaport town about seven miles from Lunenburg.

It was incorporated under the acts of Nova Scotia in 1916, the incorporators being Selvin A. Ernst, Willis Ernst and Arthur Ernst, all sons of the late Abraham Ernst.

This company took over the business formerly conducted under the name of J. Ernst & Sons. That business had been established nearly a century ago by Jacob Ernst, the grandfather of the three Ernsts who are now the chief stock holders of the new company.

The business originally started by Jacob Ernst grew rapidly and after his death was carried on by his son Abraham, under whose regime, the development of an ordinary trading business was pushed forward to one which included the selling of goods and purchasing of lumber, then the purchasing and shipping of fish and managing and controlling vessels. He also conducted a ship yard and built several steamers, including the "Kinburn," and "Mahone," which plied between Halifax and Mahone, also several other steamers for owners in Halifax. He built many vessels, the models of which were favorably commented upon by all who saw them.

Mr. Abraham Ernst died about five years ago, and up to last year, when the business was incorporated, it was carried on by the executors of the estate. The present company is carrying on a large general business, outfitting a number of vessels for the bank fisheries, and carrying on extensive lumber operations. The president of the company is S. A. Ernst; vice-president, Willis Ernst, secretary-treasurer, Arthur Ernst.



Ritcey Brothers, Limited, Riverport.

RITCEY BROTHERS, LIMITED, of Riverport, is the newest firm in the country, and it is safe to predict a bright future for this firm as it is backed by men who have been eminently successful in their undertakings.

Two brothers, Charles H. Ritcey, and St. Clair Ritcey, purchased the general business of H. W. MacGregor, Riverport, and carried on such an extensive trade with the people of Riverport and vicinity, that they succeeded in increasing their turn over one hundred per cent.

These young men, having faith in themselves, and their ability, interested a number of prominent men and successful fishing captains to such an extent that on January 31, 1917, the business was organized into a Limited Stock Company, with a paid up capital of \$35,000. The business was incorporated under the name of Ritcey Brothers, Limited, with William Duff, of Lunenburg, president; H. R. Silver, of Halifax, vice-president; Charles H. Ritcey, managing director and St. Clair Ritcey, secretary-treasurer.

Improvements and extensions are being made in the

increasing business supplying fishing vessels with all requirements.

The premises occupied by them, was formerly owned by the late L. B. Currie, of West Dublin, who in 1901 purchased this property and built a fine store at LaHave.

His early demise has been much regretted by all interested in the fishing industry as he possessed seemingly a sixth sense regarding the pulse of the foreign markets.

At his death, the property was purchased by the Atlantic Fish Company, who occupied it for several years, and after the removal of their boneless cod business to Lunenburg it was sold by them to the LaHave Outfitting Company.

This company is said to be the only one of the firms that has the bulk of its stock distributed among masters and ship owners only.

Last year they outfitted fourteen trawlers and eleven hand liners; this year there are fewer handliners and more trawlers.

They also have a number of schooners engaged in foreign freighting, their values running from \$9,000



La Have Outfitting Company.

store property to handle the increasing volume of business; a large warehouse is under construction with a salt store in connection, and the wharf is to be run out probably 100 feet extra.

The LaHave and Riverport fleet have shared in the good fortune of the Lunenburg County fishing vessels in no small degree, and the hustling skippers of this section have caused their vessels to pay big dividends.

One new vessel last year outfitted by Ritcey Brothers, earned one hundred dollars more than her entire original cost, during her banking trips and two freighting trips to Oporto.

Ritcey Brothers are out for business and no one need be surprised to hear of them giving an excellent account of themselves in future.

They are particularly wide awake to the advantages of the Canadian Fisherman's Increase Production Campaign and are heartily in accord with the movement.

The LaHave Outfitting Company, Limited, LaHave.

THE LaHave Outfitting Company, is a live concern situated at the mouth of the LaHave River. It was incorporated five years ago, and has since been engaged in a steadily

to \$20,000.

A branch of the Canadian Bank of Commerce occupies the top floor of the building.

The business is managed by a board of directors of which Captain Joseph Conrad, of Upper LaHave is President, and Fraser Gray of LaHave is Secretary-Treasurer.

Here are the vessels, the men and the wish to engage in this lucrative industry.

At any rate it is the only place that I have heard fresh fish talked at all.

Here are the vessels, the men and this wish to engage in this lucrative industry, and the whole scheme is held up because there is no railway, nor any expeditious method of shipping fresh fish to the wanted markets.

Only twelve miles of road would be necessary to connect with the main line at Bridgewater and a spur road of that length should not seem an unsurmountable obstacle. Especially so, where it would give impetus to probably the best paying industry in the world, that could be brought to the county.

Lunenburg captains know little about selling their

stocks fresh. Only three of the fleet sold their early spring stock fresh this year. They were Captain Ellison Creaser, of the schooner "Donald Creaser" of Riverport; Captain Abraham Cook of the Lunenburg Schooner "Clentonia", and Captain David Backman of the Riverport Schooner "Marjorie Backman."

They ran into Halifax after a ten days' catch and disposed of their stock at a big figure.

The Majorie Backman stocked \$7,200, which was fair money for the length of time it took to earn it.

LaHave Fish Company, Limited.



THIS company are packers and shippers of cod, haddock, hake, pollock, tongues and sounds, cod oil, herring, mackerel, etc. General merchants and agents, and are located at LaHave. Mr. J. E. Backman, of Riverport, is President of the company. This concern is one of the coming successes on LaHave River, and is at present doing a thriving business.

It is a sad commentary on our times that a fresh fishing industry in this county should be handicapped by lack of a railroad or lack of capital to build it.

Especially so is this true, when it is known that there are hundreds of thousands of good Lunenburg County dollars, reposing peacefully in Western Muskies, and lands which will not have a town built near them in another century.

It is said that \$100,000 went out of here at one wallop, and that was not the only hundred thousand, that went by any means, and it was the hardly earned cash of level headed fishing skippers who tried to persuade themselves they were J. Rufus Wallingfords in Embryo.

Those hundreds of thousands devoted to building up a fresh fishing industry in their own county, would have enriched themselves and their native land, but that would be too sane and practical a scheme to attract the average investor, not enough wild cat about that to prove an attractive lure.

A prominent stock broker told me once that his success in business was solely due to the fact that he understood human nature.

He never attempted to boom an industry in the town in which it originated because it was human nature to knock it, no matter how good the proposition.

His method would be to sell that stock a thousand miles or as many more as he could get away from that town and then interest the citizens of that town in something a thousand miles from them.

If that is human nature, the sooner it is knocked out of people's heads the better.

If there is a solid money getter as a prospect in your home town, examine it over, under, around and through then if it appears satisfactory, finance it and let the meteors such as fox farms, skunk and mink ranches and others of dazzling promise severely alone.

Many a one in Lunenburg to-day regrets falling for a smooth stock seller, but opportunity lies right at the door in the shape of a fresh fishing industry, which would mean prosperity for all concerned.

There has always been a kick about the young men of Lunenburg County going away as soon as they grew up, because there was not enough lucrative employment for them at home.

Many of these youths, the most valuable asset of

any county, would be glad to come back to engage in the different industries which capital kept at home and wisely invested, could establish in and around Lunenburg.

It appears as though the world wide tragedy of the war will restore to their proper place things that really count in life.

The aftermath will bring plainer, simpler and better living.

The spending of hoarded monies which were gathered during peace will bring less prosperity to the bulk of humanity, and capital must be expended more carefully and enable all to live with a degree of comfort, with the extravagance of before the war times providentially curtailed.

False standards will be lowered and monied people will be forced to realize that the only good of money is the good that it can do.

Hoarding money in banks for generations will be regarded as almost wicked and the true value of capital, that of being valuable only when it is working for the benefit of humanity will be learned.

The war has taught the world many lessons, many of them sad and sorrowful lessons, but it has opened the eyes and hearts of the monied people as they never were opened before and has restored to their proper place the essentials of life which were in danger of being overlooked in the individual struggle for capital.

NORSE FISHERIES SUFFER.

Whalers and Sealers Victims of German Subs.

London, June 12.—A despatch to the Exchange Telegraph from Copenhagen says German submarines are operating on the west coast of Norway against the valuable Norwegian sealing and whaling fisheries.

The Dagblatt says, according to the correspondent, that yesterday the whaler Sverre II. was sunk outside Tromsøe, and that another whaler, the Sverdrup, was sunk near Falso, the latter having a cargo of 500 seals. The crew was given two minutes to enter the ship's boats.

A NEW REVERSE GEAR.

Among the newest devices that are being introduced to Canadian Fishermen is the Ball Bearing Marine Reverse Gear manufactured by the Carlyle Johnson Machine Company of Manchester, Conn., U.S.A. This concern is one of the pioneer Reverse Gear manufacturers, their various patents covering clutches and Reverse Gears dating back to 1884, and after experimenting in their own factory and with their own boats they put on the market in 1902 the first Reverse Gear of an encased design manufactured. Improvements followed and in 1911 they brought out a compact light weight gear manufactured from Vanadium Steel, and in 1914 startled the motor boating field by placing on the market the first ball bearing Marine Reverse Gear.

The present type of gear manufactured by the Carlyle Johnson Machine Company is the only Reverse Gear on the market which has embodied the principles of an automobile transmission, and far surpasses anything that has yet been developed. An interesting leaflet is distributed which fully describes the Johnson Marine Reverse Gear, and readers of "Canadian Fisherman" can obtain a copy of this circular by addressing The Carlyle Johnson Machine Co., Manchester, Conn., U. S. A.



To Western Bank

on a

Steam Trawler

The Log of a March Trip on a Modern
Canadian Steam Fisherman.

By FREDERICK WILLIAM
WALLACE.

(Photographs by the Author).



STEAM trawling by either the beam or otter trawl is quite a new departure for Canadians to engage in. These craft have frequented our Atlantic fishing grounds for many years, but they came over from France and England in the Spring and returned with their fares salted in the Fall. One of the first steamers to engage in trawling in Cana-

the Pioneer Steam Trawling Co., of Halifax, who were later bought out by the Maritime Fish Corporation, Limited.

The latter Company operated the "Wren" for two years and paid dearly for their experience in otter trawling on the Atlantic coast. The pioneer work in this little craft, however, was the foundation for the



Heaving Up on the Trawl Winch.

dian waters, was, I think, the Grimsby trawler "Magnetic" which salt-fished in the Gulf of St. Lawrence ten or twelve years ago. The first Canadian owned trawler which made a steady try at the work of fresh fishing for the Canadian market was the "Wren"—a small British built vessel of 90 tons—and owned by

success of the others which followed her. The "Coquet", another small trawler, came over from England and fished on our coast for a time, and within the last four years came the larger British trawlers "Cambodia", "Carmania", "St. Leonard", "Rayond'or" and "Andromache". The latter vessel was an Irish

trawler from Cork and engaged in salt fishing almost exclusively; the others engaged in fresh fishing and sold their fares to the Maritime Fish Corporation, Ltd., the North Atlantic Fisheries, Limited, National Fish Company, and Lockeport Cold Storage Company.

When war broke out, the "Andromache", "Carmania", "Cambodia" and "St. Leonard" went home to Great Britain, and the "Rayond'or" continued fishing for the Maritime Fish Corporation, Limited, and ran her trips to Canso, N. S. The vessel was then owned by Messrs. Olesen & Jensen, who afterwards sold out to the Maritime Fish Corporation's subsidiary company—The Golden Ray Steam Fishing Company, Limited.

Steam trawling was engaged in on the Pacific coast out of Vancouver by Sir George Doughty. Several vessels were operated, but the Company failed and the ships were laid up. One of the largest vessels, the "Triumph" was bought recently by the National Fish Co., of Halifax and brought around to that port. The Lockeport Cold Storage Company, Limited, bought a French steam trawler, the "Baleine", but chartered her for naval purposes.

At the present time there are two Canadian owned steam trawlers operating upon the Atlantic coast—the "Rayond'or" and the "Triumph". Two American trawlers are fishing for the Maritime Fish Corporation at Canso and Digby under charter, so that we now have four vessels fishing by otter trawl out of Canadian Atlantic ports. The Leonard Fisheries, Limited, will operate one or more steam trawlers shortly, and it was reported that Messrs. A. & R. Loggie of Loggieville, N.B., intend to fit out the steamer "Orontes" for steam trawling.

The writer had fished in practically every other manner of craft—Pacific long-liners, dory halibuters, Bank haddockers and on shacking trips, and wishing to keep in touch with all modern developments, took a turn at steam trawling.



CAPTAIN MARTIN OLESEN of the big steam trawler "Rayond'or" extended a very hearty invitation for me to have my round bottomed trunk aboard of his ship and try steam trawling for a change. I joined the steamer in Halifax on March 24th, and came prepared to pick out a lower fore-castle bunk and sleep in my clothes for a week or more Bank schooner fashion. I was agreeably surprised when I was ushered down into a decidedly snug cabin under the wheel-house—a specious room panelled in mahogany and furnished with two wide cushioned sofas, steam heat, electric light, electric fans, folding wash-basin, and all the "trimmings" of a de luxe cabin on a tropical liner. It certainly was a contrast to the accommodation on some of the Bank schooners I voyaged in, and I saw at a glance that my oil-clothes and sea boots could remain in my bag. I'd never need them on this hooker.

We got out to sea on Sunday morning and headed for a certain spot on Western Bank. At 6.30 p.m. stopped the ship and sounded, and the Skipper passed the word to get ready and "shoot the gear!"

The Otter trawl gear consists of a large cone shaped net with a mouth about 80 feet wide, which is kept open when trawling by two Otter doors or boards at each side of the mouth and to which the towing warps are attached. The foot-rope of the net's mouth is of wire with hardwood rollers or "bobbins" strung on it to prevent the gear snarling on rough bottom. The otter boards are furnished with shoes like sled runners,

and slide over the bottom on their edges. The cone or small end of the net is made of heavier mesh and is closed and opened with a sort of draw-string. This is known as the "cod end" and the fish caught in the net find their way into it and are retained there until the gear is lifted, the cod end hoisted aboard, and the draw rope pulled to dump the fish on the deck.



Hauling the Net Aboard (Note the other board at the Gallows.)

Fitted on deck forward of the midship house is the powerful steam trawl winch. Hundreds of fathoms of steel wire trawl warp are wound around the winch barrel and pass through leads and around bollards to the two gallows erected fore and aft on both sides of the ship. Before lowering away, the two trawl boards are hoisted up to each gallow and the net lays inside the rail between them.

To shoot the gear, the crew heave the net overboard and the winch man pays away on the trawl warps while the vessel steams slowly ahead. When the gear reaches the bottom, a considerable length of warp is paid out and the vessel steams full speed ahead and tows the trawl astern—keeping the two warps fast

alongside the quarter of the vessel by means of a messenger warp.

After towing for about an hour and a half to two hours, more or less, the ship is stopped and the gear hove up by the winch. When the otter boards come up to the gallows, all hands lay hold of the net and haul it up as far as they can; a strop is passed around the net and carried to the winch. The whole is then hove up by steam until the cod-end of the net comes over the rail by the fore-rigging, when the draw rope is pulled and the fish dumped into the pens on deck.

As soon as this is done, if the fishing is worth it, the gear is lowered away again, and night and day the work goes on without cessation. While the trawl is overboard, the crew dress down the fish and stow them on ice in the hold in the same manner as on the schooner fishermen.

In steam trawling it is possible to fish in quite rough weather—weather which would prevent dories being

engines of 68 nominal horse power, built at Beverley, England in 1912. She is what is known as the Iceland type—a class of trawler used in the Iceland fisheries—distant voyages.



Spilling the Cod End.

Equipped with electric light, three compasses, searchlight, Morse flash lamp, and a steam liver rendering plant, she is an up-to-date fishing vessel in every respect.



The Bag on Deck. Ready to pull the draw rope of the cod end.



Dressing the Fish.

worked. There no bait, hooks or lines to bother about, but steam trawling is more expensive to operate than schooner and dory fishing and the cost of up-keep and repairs are heavy, so that it requires good trips and short spells at sea to make it pay.



THE "Rayond'or" is one of the finest type of steam trawler afloat. She is a steel, screw steamer, 191 tons nett, 140 feet long, 24 feet beam, by 13 feet depth, and triple expansion

Captain Martin Olesen has been fishing in the Canadian waters for some five or six years and was practically a pioneer in practising steam trawling on our grounds with success. He is a man who believes in taking a chance and while some of his experiments have been expensive in losing gear and broken trips, yet, on the whole, he has made a great success of the business.

To return to our log. The first haul yielded us some 700 pounds of haddock, cod and pollock. The second haul showed the cod end floating on the water, as it does when there are over a thousand pounds in the bag, and we dumped 1,500 pounds of fish into the pens. Fine clear night, smooth sea, slight swell.

MONDAY, MARCH 26th. Fine, smooth sea. Trawler "Triumph" in sight shooting and hauling her gear. Also ten vessels of the Lunenburg fleet anchored and with dories out. Shot and hauled gear at two hour intervals all day with but small hauls. After dark, the catch was better—two 4,000 pound hauls coming up.

TUESDAY, MARCH 27th. Morning opened with fog. Light hauls. Fog continuing, in the afternoon we made a shift to get clear of the schooners anchored around, and shot the gear on Emerald Bank. Very little doing. Fog dense.

WEDNESDAY, MARCH 28th. Shifted back to Western Bank and worked the gear. Better luck. Hauled a full bag of 10,000 pounds. Fog and moderate gale from southeast. Blowing and raining all day. 5.30 p.m. Trawl warp on after door parted and a big haul of fish escaped. Repaired gear and shot again. Good hauls during the night.

THURSDAY, MARCH 29th. Fine day. Heavy swell. Good hauls all day. 5 p.m. Best haul yet. Getting cod end up, net broke and half the fish escaped. Only 500 pounds saved. Bent on a new net. 11.30 p.m. Best haul so far. 20,000 pounds dumped aboard. Rough night. Strong S.W. wind, rough sea. Fishing all night.

FRIDAY MARCH 30th. Thick fog. Heavy swell. Another 20,000 pound haul of haddock, cod, pollock and skate made. Hauled all day—good fishing.

SATURDAY, MARCH 31st. 2 a.m. Snowing and breezing up from N.W. Crew lashing up the gear. 9 a.m. Swung off for Canso in a heavy sea. Made Cranberry Island Light at midnight and stopped ship 5 miles off. Fine night, sea moderating.

SUNDAY, APRIL 1st. Steamed into dock at Canso and tied up. Out-turn of trip—100,000 pounds. Thus ends this log.

PRINCE RUPERT NOTES.

The month of May has been a proud one in the fishing line in Prince Rupert. It has seen well on for three and a half million pounds landed here during that calendar month. The preceding month of April with about two and a half million pounds was regarded as a good one but the month that has just closed reaches nearly a million more.

In connection with this catch there has been practically no salmon for canning purposes taken. The season has not opened for that branch of the business with the exception of a few spring salmon that have been taken in the Skeena River and which will be mild cured or frozen.

The great producer in May was the halibut which reached an amount landed at this port that has very seldom been exceeded. It reached well on for three million pounds alone. The amount landed was 2,809,000 pounds. There is no doubt that it would have reached the total of three millions had it not been for the fact that during the last days of the month, with a tremendous amount of fish being landed here, the G. T.P. found it impossible to get enough express refrigerator cars to deal with the situation.

This car shortage has occurred once or twice this season and is a serious handicap to the trade requiring some of the fish to be delivered elsewhere where

shipping can be obtained. The G. T. P. has tried every plan possible to overcome the situation but without success at all times at least.

It is explained that the congestion of shipping on the American lines has made it a very difficult matter to get cars back again once they pass over the boundary line. The companies on the other side prefer to pay the per diem fee rather than get them back on to the Canadian side.

The difficulty is explained as due to the fact that in some instances the cars get congested with other shipping on the tracks and rather than go to the trouble to get them on their way to their proper destination they allow these empty cars to remain. In other instances the cars are used for the trade of the lines on the other side. The situation is one that has caused a lot of concern not only to the fish men but to the company handling the trade.

One effect of this little shortage has been that there has been put into cold storage here in the magnificent plant of the Canadian Fish and Cold Storage Company quite a tonnage of halibut to be frozen which would otherwise have reached the market in a fresh condition.

During the month of May about one hundred cars of fish went out by express while in addition there has been a very active trade shipping by steamer from this port for the Prince Rupert halibut is getting an enviable name for itself for the quality of the fish that is sent out. This is due to the fact that the fish reach this point in the very pink of condition and gets away before there has been any deterioration.

The Trawler "Carruthers" belonging to the Canadian Fish and Cold Storage company is making good in its particular line which is a new departure for this coast—bringing in about 100,000 pounds of mixed fish each trip—the total catch for the month of May amounted to about half a million pounds. Of the catches made by the trawler, flat fish that have hitherto been brought in very small numbers, are now being landed in considerable quantities. The figures for the month in these lines which represent nearly altogether the catches of the "Carruthers" are as follows: Soles, 138,100 pounds; Flounders, 50,900 pounds; Skate, 8,000 pounds, other flat fish, 10,400 pounds.

The trawling "harvest" is a wonderful one, especially in view of the fact that it is a new style of fishing on this coast on the scale on which it is carried out by the Canadian Fish and Cold Storage. The fish are taken close to the port in Hecate Straits and the quality is therefore of the best owing to the fact that the trawler is out only a few days.

For the month of May there was 230,600 pounds of salmon landed at this port. This is of course all spring salmon the season being too early for the commercial canning fish. This amount, with a very small quantity taken in the Skeena in nets, was brought in by the trollers which operate out of here and who will continue to follow this line of enterprise for the summer. As has been mentioned before in these columns this fish finds its way into cans only to a very limited extent. It is used in the fresh condition being the most delicious table variety of the salmon of the Pacific coast. In addition to this the fish is cured by smoking slightly and also by the system of mild curing.

Cod represented 150,500 pounds during May. Of this quantity no small proportion was black cod which is becoming under different names including that of Alaska cod and Sable fish, very popular.

Crabs to the amount of 800 pounds were landed.

Better Barrels

An Interview With a Scotch Barrel Expert



MR. ROBERT GRAY, Government Fish Inspector, continues his good work in the Maritime Provinces. Mr. Gray has some definite ideas respecting the manner in which certain methods used in the fish industry could be improved.



Mr. Robert Gray.

He is especially interested in the betterment of barrel making, and gives demonstrations in the various fish centres of the proper manner of constructing barrels, as well as of curing fish. Mr. Gray came to this country from Scotland a few years ago, and his expert knowledge of the best methods of fish production and cure in the Old Country led to his present appointment by the Dominion Government.

"How could you describe the Nova Scotia fish barrel as you saw it when you came out?" the "Fisher-man" representative asked him.

"As being the poorest fish package I ever saw. The staves and ends were much too thin and only hanging

together. There was no evidence of the barrels having been trussed, and the hooping was also altogether too light."

"Are barrels of this class good for any purpose?"

"I dare say they could be used for shipping potatoes or cabbage in, but for that they may be unsuitable, being much smaller than the package used for that purpose."

"Are the native woods of Nova Scotia suited to making first-class fish barrels?"

"Yes, there is plenty of good wood in Nova Scotia, but of course for first-class pickle barrels the wood has to be carefully selected, only the best being used in their manufacture. Other grades of wood can be worked up in what are known as dry barrels or boxes."

"Do the Nova Scotia hardwoods make good barrels?"

"The hardwoods make a strong barrel, but personally I prefer good spruce which is much lighter, cheaper, and more easily worked. Spruce is also closer in the grain, and where I can blow pickle right through hardwood I cannot do so with good spruce. Another thing of importance is that in the manufacture of barrels to be used for herring cured by the Scotch method, a facsimile of the Scotch barrel is desired. That in fact is necessary, and spruce with a very small percentage of fir is the only wood used for the purpose now."

"Will you state the different kinds or classes of barrels suitable for packing different kinds of fish?"

"At present there are three standard sizes of barrels and half barrels being made in Nova Scotia. The Scotch whole and half herring barrel, the mackerel whole and half barrel which is also used for salmon, and the Canadian herring barrel into which is also packed alewives."

"How would you make an absolutely tight fish barrel?"

"To begin with I would see that I had the right material and tools. Then I would prepare the joints of both ends and staves so as there would be no possibility of a leak. The barrel or half barrel should then be properly fired and trussed with at least six heavy iron hoops specially made for that purpose, the chimes are then carefully worked out, every suspicious looking knot carefully puttied or coated with a solution to prevent the pickle leaking through them. The Scotch herring whole and half barrel is particularly cleaned on the outside with a tool called a plucker, across the grain of the wood, but other pickle fish barrels only have the overwood taken off with a spokeshave, and very often left uncleaned altogether. A line should then be drawn around the barrel or half barrel to a gauge about a third of the whole length of the stave from the end, and the first hoop should fit absolutely tight on that line. After the package is quarter hooped the bottom is put in and hooped as firmly as possible with several wood or an iron hoop. Previous

to putting in the head, a little pickle, about half a pint, should be poured into the package for testing its tightness. The heading up and hooping is then completed. I may say that the bottom and head should fit perfectly so as to be firm when in the croze, not too large so as to cause the joints of the staves to open, neither should they be so small as to be loose when the end hoop is taken off. When the package is finished a hole three-eighths of an inch is bored in the head, not in a joint of the head, and the package blown full of wind. The package is then rolled round in such a way that the pickle which is inside should touch every part of every stave, also the inside of the bottom and head, and should there be the smallest leak the wind will immediately force the pickle through. I may add that when a practical man has made the package out of good material it is a very rare occurrence to find a leak of any consequence.



"ARE you instructing the Nova Scotia fishermen in barrel making?"

"Wherever my services are required I give all the assistance I possibly can, but it seems to me that the rising generation of fishermen prefer to buy their barrels ready made. This I believe is a wise thing to do, as, speaking generally, a fisherman as a rule has not the time to practice barrel-making so as to become fully capable of making a barrel as it should be made. There are exceptions, however, and in any case I demonstrate in various centres so that the workers may have a proper idea of what a fish barrel ought to be. It is encouraging to notice the results in many cases. Indeed with time and patience we shall see people who now think that any kind of a package is good enough to carry pickled fish, glad to do their utmost to produce packages up to the standard, for otherwise they will be forced out of the business. Many of the fishermen are now quite alive to the fact that a good package is a most important factor and will not purchase a package just because it is cheap."

"How should a barrel be hooped?"

"The Fish Inspection Act allows pickled fish barrels, wholes or halves, made of either hard or soft wood, to be hooped in three different ways: (a) Entirely with wooden hoops, (b) Partly with wooden hoops, and partly with iron hoops. (c) Entirely with iron hoops. Wooden hoops are preferred on the quarters of the Scotch whole and half herring barrel, with the regulation iron hoop on the chimes."

"You would then not advise the individual fisherman to attempt to make tight barrels for his own use?"

"It is of course possible for him to do so, but I am afraid not practicable in every case, for a barrel-maker wants a practical training, and I am afraid the average fisherman could not devote the necessary time to make himself efficient at this work."

"You would favor factory manufacture of barrels on a large scale rather than individual manufacture?"

"I am strongly in favour of practical coopers making the barrels, and I feel sure that until this is done we are bound to have more or less trouble with inferior barrels. What with keeping their boats and gear in order, besides attending to fishing, the fishermen really have enough to do."

"Would you say that co-operative methods could be utilized to advantage in making barrels?"

"I am a believer in co-operation, but would not say offhand that co-operation amongst fishermen making their own barrels could be applied to advantage. Of course they could co-operate in the purchase of the

stock for their barrel-making, and employ practical men to do the coopering, but the quantity of barrels used by the fishermen are so small that the saving in this would be only a small item. In a fishing community where a carload of barrels would be used, fishermen could club together and order a carload instead of each individual ordering his own. This I imagine would mean a saving in freight.

It is quite apparent to me that fishermen would prefer selling their fish, and allow the fish merchant to do the curing, and I believe that this system will be adopted very generally before long. The fishermen would then be able to handle more fishing gear, which would mean a very considerable increase to our fisheries, also an improvement in the quality and uniformity of the cure, besides employment for people on shore who cannot for many reasons go fishing. At the present time the majority of fishermen cure their own catches, and the consequence is that they can handle only a very limited quantity of fishing gear. The fisherman has to get on shore and put his catch in salt, or he is not going to be able to produce a good article when cured.



EVERYBODY knows that Scotland is the greatest herring fishing country in the world. There the fishermen's time is all taken up with his boat, gear, and fishing. The buyer attends to the purchasing of the fish, the tally-man takes delivery, sees that the fish are up to the standard bought, and that the weight or measure is correct, the fishworker cleans, grades, and salts the fish, and the cooper who is a practical fishcurer makes the packages, superintends the curing, etc., and makes the packages ready for the market. In this way you can see that each individual is an expert in his own branch."

"Are the barrels now being made in Nova Scotia of standard size?"

"I am sorry to admit that only a proportion of the barrels and half barrels now being made in Nova Scotia are really up to the standard in every sense of the word. There is quite an irregularity in both the sizes and shapes, in fact nearly every barrel-maker has his own style, and it takes time to make coopers see this, and to work them into producing uniform packages."

"Has our industry here suffered much from poor barrels?"

Undoubtedly, and I believe very serious. The storing of inferior barrels, in buildings with leaky roofs, packing too many fish in a puncheon which expresses the top tiers to rain and air, and the carelessness or want of knowledge in coopering has meant the loss of hundreds of thousands of dollars to the fishermen of Nova Scotia."

"Are absolutely tight barrels necessary for cures other than the so-called Scotch cure?"

"Absolutely tight barrels and half barrels are necessary for all kinds of pickled fish, for when pickle gets off the fish, those fish are bound to become discoloured and will deteriorate. Hence it follows that all concerned are losers. The fisherman, from past experience, expects only leaky barrels from the cooper and does not feel like paying an increase in price for a package he is told is good. The fish merchant expects quite a proportion of bad barrels, and consequently bad fish, from the fisherman and naturally pays a price accordingly. When it comes down to the consumer he is not very anxious to buy, because perhaps the last fish he bought was bad. That sort of thing acts like a brake on the driving gear of the pickled fish business. But this can be removed."

"What consideration is given the barrel when inspecting the pack?"



"THE barrel is the first consideration, and before an Inspector proceeds to examine the contents he has to satisfy himself that the barrel is a standard package. Therefore, you see the barrel figures very prominently, for it does not matter how good the contents may be or how careful and particular the curer or packer has been, if the cooper has not performed his bit faithfully, the fish in that barrel is condemned through no fault of the fisherman, curer, packer or merchant."

"What in your opinion would be the easiest and quickest way to overcome this trouble of the inferior barrel?"

"The quickest way, although not the easiest on every one, would be to make the Fish Inspection Act compulsory, or, at least that part of it which deals with the construction of barrels and half barrels. By doing so, barrel-making would be tuned up in a very short time. As it is at present a man, be he cooper or fisherman, who does his very best to produce the goods is not appreciated as he should be. He realizes this and naturally asks himself, "Why should I go to this extra trouble and expense when my neighbour who uses an inferior package and puts up his fish any old way, gets the same price for his goods as I do?" That question has been put up to me time and again."

THE PICKLED FISH INDUSTRY.

Some Suggestions by Inspector Robert Gray.

It is generally believed that a certain proportion of the members of the Fish Trade of Nova Scotia are taking the Fish Inspection Act too lightly, and my own observations lead to the same view. This is unfortunate, as the less the serious thought given to this most important matter the greater will be the length of time before the pickled fish industry of Nova Scotia comes into its own.

I have been told that not so very many years ago the belief was general that a West Indian negro would not eat a Nova Scotia cured herring. Whether this statement is true or otherwise, the reason for its currency would not have been hard to find, particularly to a practical man. A glance at the barrel in most cases was sufficient proof that the contents could not possibly be good, and even at the present time the majority of fish barrels made in Nova Scotia are not only not standard-made but are leaky. As a matter of fact every barrel should be tested before it leaves the cooper's hands, and should there be the least sign of a leak, that leak should be immediately corrected. What this one small move in the right direction would mean in the way of more remunerative returns would astonish the easy-going workers who "can't be bothered" to do things right.

I have had long experience in the fish trade of Scotland, and so far as I could learn I believe the methods of cure practiced in that country were learned from the Hollanders over fifty years ago. But the Scotch were not satisfied with what they learned but went to work determined to beat the Hollander at his own game. This they in time accomplished by simply improving on everything they already knew. For one thing they made better barrels. One of the outstanding features of barrel making in Scotland is the method of trussing, and until Nova Scotia coopers realize the fact that their barrels are not sufficiently trussed, and adopt a more careful method their fish barrels will

continue to resemble flour and apple barrels. Among a stock of Nova Scotia barrels a number will appear all right until they are moved. The proportion of tight ones will then gradually lessen. Even if the staves are made two inches thick that will not improve the barrel unless the staves are thoroughly trussed together.

The Scots exercise the greatest of care in the selection or grading of their herring. By experience they know just what the consumer wants and therefore produce the goods he will cheerfully pay for. The packing is done in the same painstaking manner, and the salting is done as uniformly as possible.

If Nova Scotians would only follow this example I fail to see why they cannot fully share in the big prices obtained by their cousins in the trade overseas. I know that fifteen dollars per barrel has been paid in the United States on several occasions for Nova Scotia Scotch-cured herring, and this fact should surely encourage competition amongst Nova Scotia packers and prompt them to use only the very best barrel obtainable, handle their fish in the very best way they know how, and try hard to come out ahead of their neighbour.

Some people claim that Nova Scotia herring are too fat to cure by the Scotch method. From my experience of over twenty years I cannot agree with that view. In fact, I have never seen herring on this side of the Atlantic as fat as the Scotch fish. Herring are caught in large quantities on the Nova Scotia coast only in shallow water where they come for the purpose of spawning, and at spawning time no fish is in its fattest condition. The matje herring, very few of which are caught in this Province, are really the fattest fish. This quality of herring are caught farther off shore and earlier in the season, just previous to the time when the milt or roe begin to develop, and when the milt or roe advances toward maturity the fat gradually disappears. Those matje herring when cured by the Scotch method are salted very lightly, very strong pickle being used instead of extra salt. The barrels are not filled quite so full as for ordinary cure owing to the fish being soft. As those matjes are meant for immediate consumption they are usually shipped right away and often bring big prices. At the same time there is a certain amount of risk in soft curing.

It may be interesting to some to mention that in the year 1905, herring drifters to the number of 1783 were engaged in fishing around the Shetland Islands, which lie off the N. E. Coast of Scotland, 21,201 fishermen, fishworkers, etc., were employed, and 1,024,044 barrels of herring, besides other fish, were the result of their labours. Those barrels contained approximately 250 pounds of fish each. I do not expect to see anything like this happen in Nova Scotia until after Crazy Bill, (the Kaiser) has gone to the happy hunting grounds, but we have the herring pond right here and North and South America waiting anxiously for fish, good ones.

In conclusion I may add that the Fish Inspection Act is already showing good results. In my possession at this moment I have enquiries from large fish firms for the addresses of people who make application for the official brand. This is proof positive that the consumer is now beginning to realize that he does not need to take the former chance of getting bad fish. The growth of this realization will ultimately lead to an increased consumption, larger prices, and the establishment of the industry upon a sounder basis.



Every Fish You Can Catch is Needed!

Not for generations has food been so scarce or so high in price! Last year's crops were generally poor the world over—and prospects this year are none too good. Yet we must produce food in plenty if we are to help supply Great Britain and feed the men at the Front.

Short of help as they are, the farmers of Canada are doing their best — yet they can't do enough. The shortage of grains and meat must be made up as far as possible by more Canadian fish. The supply in our coast and inland waters is practically unlimited, and

The catch can be greatly increased if every fisherman will do his utmost!

Remember that there is more than your own profit depending on your work this season! The fighting men at the front, and the armies of workers who keep them supplied, are looking to you to "do your bit" by helping feed them! Every extra hour you work — every bit of bad weather you face — every extra fish you bring to market — is true "National service."

Your reward will be generous, for present prices mean handsome profits. Save these profits, invest them in Canadian War Savings Certificates, and you will be doubling your service, for

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Who's Who in the Fishing World

Captain Harry West, one of the old-timers on the Fraser River, has blossomed out as a fish broker and commission agent, with offices at 811 North West Trust Building, Richards St., Vancouver. The Captain has, man and boy, been in the fishing game in B. C. these thirty years and more, and was kippering herring in Billingsgate, when in knee pants and before he could say his prayers unaided.

He was brought up on fish in London, England, and has been thinking in terms of fish ever since and doubtless will continue to the end of the chapter. Hence, whatever he says regarding fish may be taken as rather authoritative as far as the circumstances will allow. At any rate, allowing for a splendid imagination, what he says of the fisheries of the Pacific may



be considered as right and the product of an intimate acquaintance from every angle, from boat-rower to boss of the job.

No matter what his title, it is as a fisherman that he will be known to fame and fortune; and to give him credit, he has no desire to be considered as anything else. He talks as a fisherman. He knows their trials and tribulations, through having gone through them, and being gifted with exceptional powers of expression he can better than any other fisherman in B. C., give voice to their opinions and tell their story. Having also had experience as a producer, he can weave into the tale both sides of the question, until he stands as the vocal embodiment of the fishing industry, if it

is humanly possible for one man to attest that title.

Some little time ago, he organized the Herring Fishermen's Union and affiliated it with the Deep Sea Fishermen's Union, as secretary and treasurer for the Herring fishermen. He was successful in putting some degree of order into the operations of the herring fishermen, getting better prices for their product, ameliorating the regulations surrounding the fishing and elevating the ideals of the members of the association. At the last annual meeting, however, he dropped out, thinking that the boys could get along all right without him and they have done fairly well, but it is likely that at the next annual meeting, which occurs soon, he will get back into harness, for he is a fisherman, though also a broker and commission agent. His heart is with the men who go to sea to fish.

Knowing the Fraser River as he does from the days of Alex. Ewen, Peter Burrell, Old man Harlock, The Laidlaws, Old man English, and Billy Wadham, he believes that this year will be a fairly big year on the river. It will likely compare favourably with the year 1909 which was a fairly big year, is his considered opinion. In this he admits that his view runs counter to that expressed by others. He recalls that many attributed the big run in 1913 to the fact that 87 million fry were placed in the river in 1909. Following this line of reasoning, he says that in 1913 there were placed in the river 147 million fry, and he asks if it is not reasonable to expect the same results as followed the placing of fry in the river in 1909? The writer has not checked the Captain up on his facts but the point of his conclusion seems right so far as it can be seen.

As a matter of fact, it is the belief of the Captain that no one can definitely forecast what the run of sockeye on the Fraser will be this year or any other year. He has seen big years in 1897, 1901 and one of the biggest ever known in 1913. In 1905 he fished the river till the season closed and did not make much more than the price of a net, but after September 15, the late run of sockeye began and developed into unprecedented proportions. Thousands of fish were sold at 3 cents a piece and thousands were thrown away for there were too many to can. From September 15 to November 19, that year, he made \$1,900 by catching fish and shipping them across the line.

The Captain, in spite of the risk, is preparing for a big run on the Fraser. He expects the price of fish to be a substantial one because it will be a fairly big year. Perhaps it will be the highest price paid for sockeyes in a big year. This high price will induce many white men to fish who are now in the lumber camps and elsewhere working. He figures that the average catch in a poor big year should be about 3,000 to 4,000 fish a fisherman. This would give the fisherman at 35 cents a fish \$1,050 to \$1,400. Out of this he would have to pay for his net \$200, his boat \$50, \$10 for the licence, and \$60 for gasoline and grub, in all \$320, leaving a net total for the season of from \$730 to \$1080 not bad for six weeks' work and a great outing on the river. There will be more intensive fishing on the river this year than ever before, is the Captain's opinion and it will be due to the demand on the part of the canners for fish as well as the high price for fish to the fishermen. Besides what the fishermen can make out of the

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I have sold one pound of T & B.....to.....
(cut or plug) (consumer's name and address)

Please send him.....stem pipe, and bundle of cleaners.
(straight or curve)

..... Address.....
(dealer's name) (street, town and province)

NOTE.---If your dealer can't supply you with T & B, just fill in his name in space above. Attach express or postal note for \$1.20, mail to us, and we will send you the tobacco, pipe and cleaners.

The Tuckett Tobacco Company, Limited, Hamilton, Ont.

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sockeye catch there will also be the pinks, the chums and the cohoes, for all of which the canners will be bidding as well the foreign buyer for export to the other side.

On the matter of the advisability of putting an embargo on cheap raw salmon going into Puget Sound points, the Captain admits that the cold storage men of B. C. bid almost as high as the foreign buyer for these salmon but says that the canners do not. If the price offered by the B. C. canners were to approximate to that offered by the Foreign buyer he thinks that perhaps something might be done about it, for the fishermen are in favor of a policy that would use the raw materials of B. C. in B. C. factories to produce finished goods, and give employment to B. C. labor. He suggests that a minimum price be set, which would be agreed upon by all concerned, and he thinks that then the fishermen would give the preference to the B. C. buyer on national grounds. He has no antagonism to our friends across the border, nor does he believe any one who thinks has, but he believes that one of the first to see the justice of a protective policy would be the foreign packer, if the matter of price to the fisherman were fixed upon an equality.



PERHAPS because he is a hard one, the Captain is no follower of the late Adam Smith as to freedom of the trade. He thinks that the opening of the rivers of B. C. to anyone who wanted to put a cannery would at the first precipitate, to use his own words, a chaotic condition and result soon after in the smaller canneries going out of business and the larger ones becoming larger than ever. He realizes that every canner is out a large sum of money in getting ready for the fish before he gets a dollar back, and that the success of the canning business is pendent on the run of fish, so that it is a very risky business and one in which knowledge and skill are necessary if success is to be obtained. Not every man has that knowledge, let alone the skill that comes only after years in the business. At the same time, he thinks that there are some streams where concessions are held but not used, that might with reasonable notice be thrown open to men who know their business and who will guarantee to develop them.

As to the use of motor boats in fishing, he says that there is no doubt that a fisherman using a motor boat can catch more fish than when he uses a row or sail boat. That has been sufficiently proven on the Fraser and he has no doubt it will be also shown on the northern streams. And he is free to state, also, that the cost of the motor boat will come out of the pockets of the canners in the first instance, though they will be repaid in time if the catches are good by the fishermen who get the boats on that condition. The initial expenditure will be by the canners and it will amount to a tidy sum. It is the tendency of the fishing industry, says the Captain, that fishing should be done in the most efficient manner, namely by motor boats. In the long run, it will work out to the advantage of the canners for they will get more fish and their fishermen will develop more skill, as running a gasoline fishing boat is a liberal education in itself.

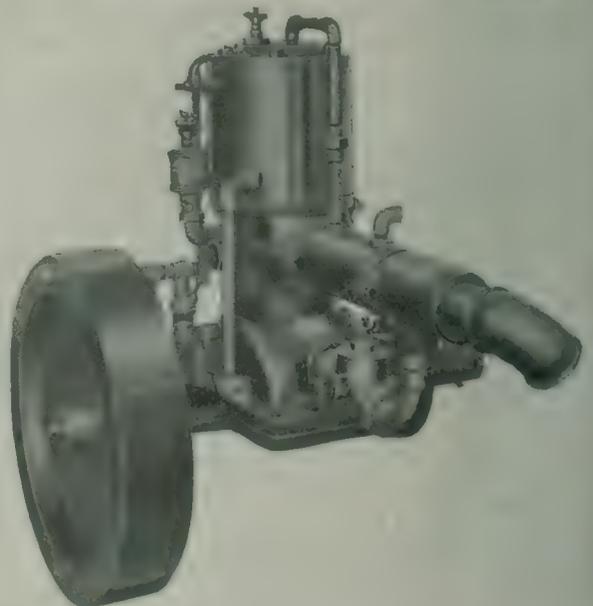
In the Captain's mind it is a serious question to decide whether during the war is the proper time in which to do away with the boat-rating and give permission for the use of gasoline boats on the northern rivers. Conditions in the industry and in finance are not such as warrant great disturbance in the handling of the fisheries. That these things are bound to come

in time is the Captain's opinion but he is inclined to believe that much thought should be given to their effect on the industry before they are instituted.

He would be in favor of a commission to investigate the state of the fishing industry in B.C. before imposing these regulation. On that commission there should be a representative of the fishermen as well as of the canners. Business men should be chosen who will investigate thoroughly and recommend fearlessly. It is a long time since all the facts regarding the fisheries have been made public but it is high time it was done so that the people may know whether the fisheries are being depleted or not, and whether more modern methods of administration should not be employed. The fisheries of B.C. are of such importance from a national stand-point, that they should have the undivided attention of a responsible minister of the crown who would inform himself concerning how the fisheries of other countries are being administered and profit by their example. Perhaps a wholesale re-organization of the fisheries of Canada would fit the case.

Captain West, as this interview shows, is keeping abreast of the times. He has large views as to the future of the fisheries of B.C., arising from his personal knowledge of how the city of Yarmouth was built up on the herring trade alone. Similar cities will arise in B.C. His opinion is worth while for he was the first man to catch a herring on this coast and he declares, that that herring wasn't blind at that. He holds himself ready to keep this journal *au fait* with the doings among the herring and salmon fishermen and is prepared to keep the whole industry right as regards the history of fishing on the Fraser River. This is in the nature of a challenge and Capt. West lets it stay as it lies.

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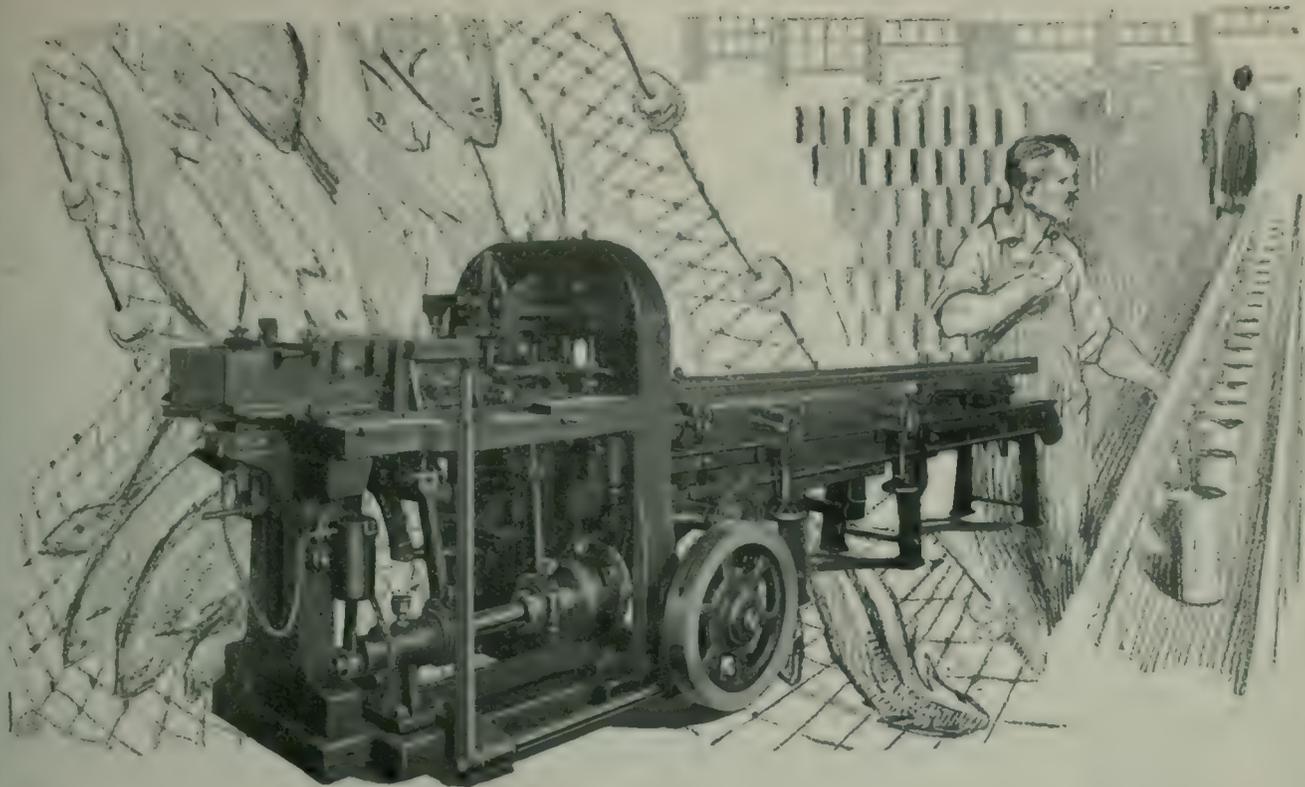


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The Lobster Situation -- Spring 1917

By HOMER D.



LOOKING backward to the time when the present clash of arms began in 1914, one realizes that the Lobster industry of the Maritime Provinces has passed through many crises. The trade from time to time has faced some alarming possibilities and been kept keenly upon the alert. Fortunately, later events have disproved its well-founded fears, and the results up to now have rendered the results satisfactory.

The first alarm in August 1914 over the financial situation was soon cleared by the prompt action of the British Chancellor, and the attitude of Canadian Bankers towards those who had shipments on the way to Europe or goods left on this side awaiting shipment.

The loss of the German markets was considered a severe blow to the business, and to find a new outlet for forty thousand additional cases of lobsters was looked upon as a stupendous task, but the new markets that arose in the military training camps and canteens in England and France or the increased monies put into circulation through higher wages earned in munition factories and elsewhere increased the demand sufficiently to absorb the supply without very drastic reductions in value becoming necessary.

The tightening of the German blockade reduced the quantities allowed to go into neutral countries, or else they created such complications that lessened the value of those markets to exporters, but no bad effects became visible.

As time went on exchange rates fell lower and lower, while the Allies were pouring their money to the American side in payment of their enormous orders, freight rates increased steadily and war risk rates for insurance fluctuated seriously, but all these took place without materially decreasing the returns to the fishermen and packers of Canada.

Twelve months ago a further commotion arose over the embargo declared by France against this class of food stuffs. Much publicity was given to the matter, a great deal of correspondence ensued, and various representations made until eventually a system of licenses was established so that all the lobsters that the trade wished to send to that country were shipped during the last season.

Prices for all goods entering into the business have increased gradually and steadily, but up to now the returns from the business have been adequate to cover all advances.

During the past winter the British announcements regarding restricted importations caused another storm, but the later permission given for 50 per cent of the usual shipments to be sent to England revived hope again.

Following closely upon this came a new French decree regarding similar restrictions and while the details remain up to now a matter of much uncertainty some modification seems probable.

Lately the submarine menace has increased or at least its possibilities more vividly realized, and as the allied governments require most of the space in ocean going steamers from this side of the Atlantic, the question of transportation stands pre-eminent in the minds of lobster exporters.

Thus far, however, even without organization many of the obstacles to the lobster business have been swept away, and yet as one disappears another looms up. Today the trade stands on the threshold of a new season confident of a good demand for its product, but filled with doubt as to the difficulties and dangers that are ahead.

The present season viewed from today's prospective

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It will always pay and interest you*

is fraught with uncertainty. Cautious operators are proceeding more slowly than usual.

The fishermen's supplies are costing them more money than ever. Rope, as an example, has more than doubled itself in price since the war opened.

The packers' needs of Tinplates, cans, tin, lead, parchment, have soared to fabulous heights. Some of them have trebled their cost in the past two seasons.



THE shippers are confronted with freight rates, etc., that are in some cases from five to ten times greater than they were before war was declared. The difference between f.o.b. and c.i.f. prices today means several dollars per case for some of the usual markets—and to all those are added the doubt as to whether the lobsters when packed can be transported to the countries wherein lies the best demand.

The general feeling is that up to a certain stage all buying is safe. The wise buyer is he who knows when to stop. Many of the lobster buyers appear to believe that the moment for them has arrived.

Some calculate that within a month there will be large stocks of these goods packed and accumulating in various parts of the Maritime Provinces that cannot be moved to their original destinations, and will either have to be held here or dumped upon the home and near-by markets until such quantities will cause a heavy slump in values.

Some packers, however, refuse to accept warnings of this nature, and consider those who venture such opinions merely like the Bears of a Stock Market. In a foolish spirit of competition many are paying more than ever for their supplies, trusting that all obstacles in the future will be removed as surely as those of the past.

The cautious attitude of the regular buyers is however a noticeable feature at the present time. One of them is said to have recently remarked that buyers with reputation, character and money must go slow now and let those who consider these three essentials less vital have the field to themselves. There is a gambling chance for their success but it is hardly a business proposition.

Perhaps by the time this appears to the public the situation will have resolved itself, but to the writer the importance of the present situation — whatever may transpire — demonstrates the need, but lack of organization and co-operation between factors in this business.

Many in their despair declare the lobster industry to be one of the insoluble human problems recently referred to by Premier Lloyd George. They cannot see a distinction between a co-operation to protect trade and a combination that restrains it, being seared by the prayings of Socialistic Agitators and Frenzied Politicians who have found a "happy hunting ground" for making a noise in this complicated business for years and drowning thereby the cry of those really interested in its reform.



BY co-operation means for transportation could more easily be found, the danger of glutting any particular outlets avoided, and a stability of all markets established, even if it should become necessary to hold the present season's pack unshipped for several months. One could then conduct a business with some assurance of success.

It will be little use for a fisherman to get high prices for his lobsters unless he gets paid for all of them. It

will be no advantage to any packer if he has a large pack and cannot dispose of it. It will benefit no one if the packer or the buyer cannot meet his bills at the end of a season. Foolish competition in one season almost invariably acts like a boomerang in the nest. A sane business might rob the industry of its newspaper popularity and the partisan politician of much of his power, but it would leave a steadier income for the fisherman, packer and exporter, a more regular annual revenue to the Dominion and a surer means for conservation of future supplies than is now possible.

The lessons of the war may be fruitful for the trade and it is hoped that these can be learned without being forced upon it by a disaster.

A NEW TRAWL BOX AND HOW TO BUILD A BOAT.

Editor, Canadian Fisherman,

In the Fisherman-February I notice an item that a Trawl Line box had been invented and patented. I don't know what it is like but I had made one myself.

I was fixing up my hooks, moods and ground line and thought it was an old woman's way to mix up the hooks with the moods and line; so dumped the whole business out on the floor: cut a piece of board the length and height of the box; inside: cut a dozen slots with a saw half way down the board and nailed it in about one third from one side, coiled up my line and moods on the larger side and dropped the hooks on the narrow side with the moods laying in the slots.

It works O.K. and pays out fine. Of course the hooks could be baited; and ice or snow packed down with the bait.

All fishermen are very welcome to use the contrivance.

How to build a boat 6'6" x 26'.—Clinker built.

Lay the keel, set up and fasten the stem and the in-post; then put one mould amidships; on other moulds fasten the garboard plank to stem, keel and stem post, then the next plank is nailed to the stem and the upper edge of the garboard plank; the next plank to the upper edge of the second and when the bilge is reached the planking has no more use for the only mould amidships; but depends on its own blend and stiffness and when the upper edge of the hearstake is reached is 6" away from the mould.

A stiffening piece 1½" x 2" is then nailed on the inner edge of the hearstake and both sides finished up.

Remember there is no frame at all as yet.

The frames 1 x 1½ are put in the steam box and lines 1 foot apart are marked on the inner side of the planks already in position.

As soon as the frames are soft enough they are taken out one by one, forced down inside to fit the planking and nailed in place while soft. — So the frames are made to fit the planking and not the planking to fit the frame.

I claim that no man is able to bend planks on each side of a boat by eye and hand; so that each side shall have the same conformation; the boat is bound to be fuller on one side than the other. Am I right?

I had a small 12 foot skiff built a couple of years ago and I never could make out why the thing always wanted to go to Port—never to starboard.

Now I know.—He is fuller on one side than the other.

Did you ever hear of a boat of any kind being built in this manner? It is the practice here.

Natashouan,

North Shore, 26 March 1917.

F. C. CREAN.

W. A. H. H. H.

THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV

MONTREAL, JULY, 1917

No. 7



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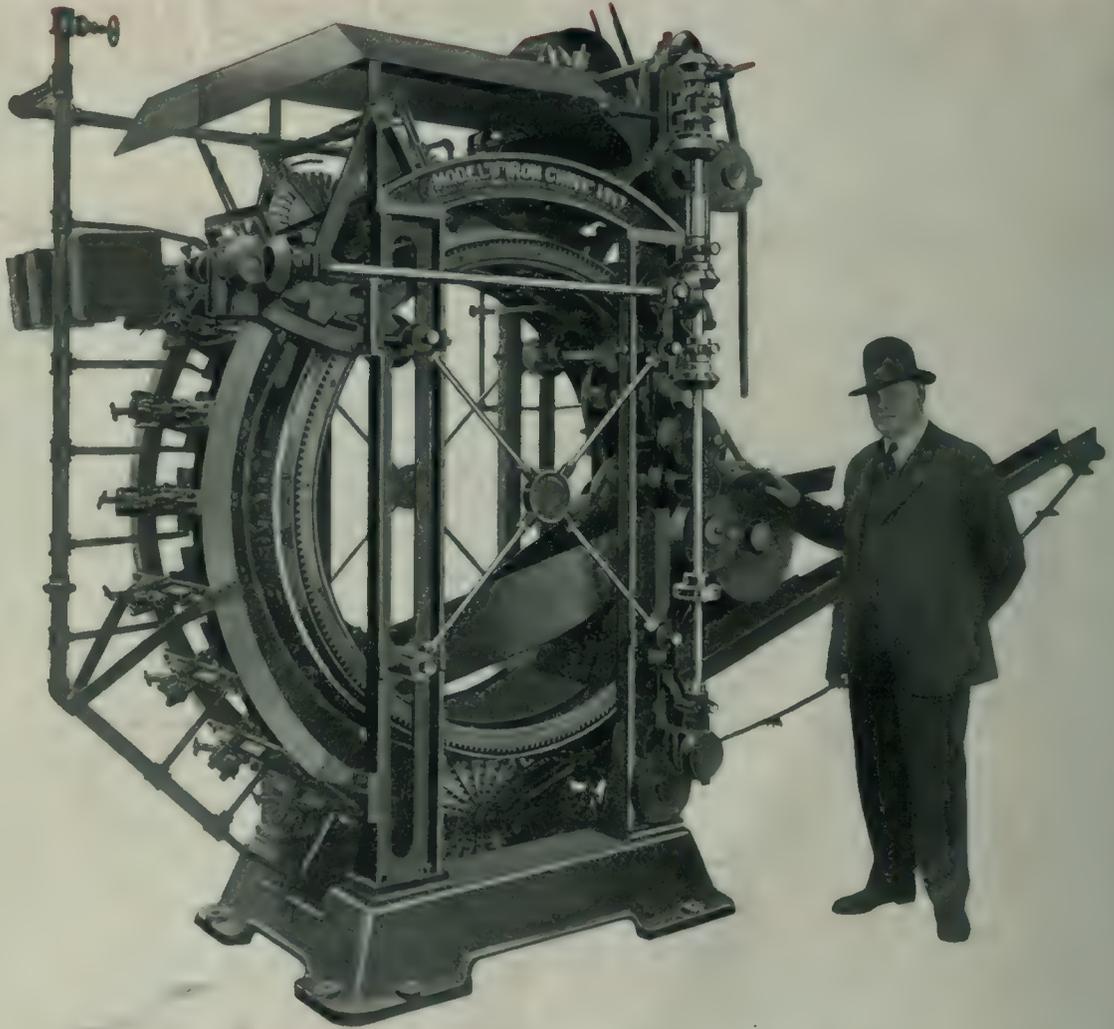
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The above illustration shows our latest improved model—one that is far superior to any we have heretofore manufactured.

We are now taking orders for 1918 delivery. Full information, prices, terms, etc., furnished on application.

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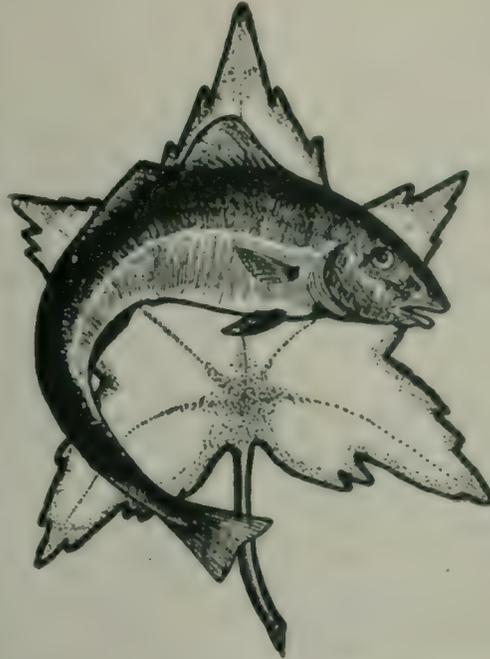
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THE CANADIAN FISHERMAN

A MONTHLY JOURNAL DEVOTED TO THE COMMERCIAL FISHERIES OF CANADA AND NEWFOUNDLAND THE SCIENCE OF THE FISH CULTURE AND THE USE AND VALUE OF FISH PRODUCTS - -



F. WILLIAM WALLACE
EDITOR

The Industrial & Educational Press, Limited

35-45 St. Alexander St. - Montreal
CANADA
Toronto Office - 263-265 Adelaide St., W.
Newfoundland Agency
Garland's Book Store, St. Johns, N.F.

SUBSCRIPTION:

Canada, Newfoundland and
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United States and Elsewhere.. \$1.50
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Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, JULY, 1917

No. 7

Settlement of Fishery Questions With United States

The "Canadian Fisherman" was glad to learn from the remarks made by the Minister of the Naval Service, when his Fisheries Estimates were under discussion in the House of Commons, that negotiations with the United States Government were on foot, which will probably lead to a settlement for good and all of certain matters on both the Atlantic and Pacific coasts, which have been causing considerable unrest, and which have consequently been militating against stability in the industry in both countries.

A brief summary of these questions may be of value.

Article 1 of the Treaty of 1818 between Great Britain and the United States measures the liberties which United States fishermen enjoy in Canadian waters. This question had, ever since the American war of Independence, been in controversy. Under this Treaty, United States fishermen are given the liberty to fish in common with British subjects in the territorial waters around the Magdalen Islands and on the north shore of the Gulf, eastward from Point Joli, as well as to land and cure fish on unsettled portions of this part of the north shore. Similar liberties are provided on portions of the Newfoundland coast. The Article also specifies that American fishing vessels shall be permitted to enter our harbours and bays for the four humanitarian purposes of obtaining wood, water and shelter and of effecting repairs, and in order that there might be no doubt about the matter it pertinently adds "for no other purpose whatever."

Differences of interpretation as to the meaning of some of the terms of this Article soon arose and gave rise to a great deal of diplomatic controversy. Prominent amongst these, so far as Canada is concerned, was the definition of a "bay" as contemplated by the Treaty. The United States contended that it meant a territorial bay in the strict sense of the term,—that is a bay not more than six miles wide or three miles from either side, — so that American vessels might fish in our bays up to within three miles of the shore to a point three miles from a line drawn across the bay at the first place where it ceased to be more than six miles wide. Canada, on the other hand, contended that the term meant a geographical bay, no matter how wide it might be.

This and other points in doubt were not settled until 1911, when they were the subject of an exceedingly interesting and important arbitration at the Hague. Canada's contention on this point was upheld, but both countries felt satisfied with the outcome, which to say the least is an unusual experience. No doubt, one of the main reasons for this situation was, that both countries were glad to have the troublesome questions settled.

In the earlier years before the advent of the steam trawler and cold storage, the successful exploitation of the fisheries depended mainly on three factors,—bait, crews and handy base of operation. Canada, situated as she is, in juxtaposition to the most important fish-

ing banks, and with her inshore waters teeming with bait fishes, as well having a large fishing population, was in a much more favourable position to carry on the fisheries than the Americans, but, on the other hand, her home demand for her product was small, and she needed the markets of the United States as well as other countries. Hence, we find that in all the international negotiations on the subject, the United States sought for her fishermen the advantages of Canadian ports and bait supplies, as well as the shipping of crews, while Canada sought freedom to the United States markets. These reciprocal advantages were exchanged by the reciprocity treaty of 1854 to 1865, and the Washington Treaty of 1871, — which came into effect in 1873,—to 1885.

Both these Treaties were terminated at the instance of the United States. When, in 1886, the United States fishermen were again restricted to their liberties under the Treaty of 1818, seizures and interferences of their vessels for invasion of our laws began with all the irritation incident thereto. Negotiations were opened up for another reciprocal treaty arrangement, and these culminated in what has since been known as the Unratified Treaty of 1888. This treaty was even more advantageous to Canada than the previous ones, and while it was approved by the Canadian Parliament it failed to receive the ratification of the United States Senate. Newfoundland was also a party to this treaty, and it was approved by the legislature of that colony.

It was out of this treaty that the so-called "modus vivendi" grew. The treaty was signed too late in the year to enable it to be considered by the Canadian Parliament, the legislature of Newfoundland and the United States Senate before the opening of the then pending fishing season, and in order to prevent further difficulties arising by seizures of vessels, and to enable its advantages to be anticipated in a considerable measure, the British plenipotentiaries offered a temporary arrangement, which was not to last more than two years, by which United States vessels would be permitted to enter Canadian and Newfoundland bays and harbours,—

(a) for the purchase of bait, ice, seines, lines and all other supplies and outfits; and

(b) the transshipment of catches and the shipping of crews,—

on taking out annual licenses, the fee on which would be \$1.50 per registered ton of the vessel. It also provided for the return of the license fees should the United States make retroactive the remission of duties collected on Canadian and Newfoundland fish.

Though the treaty was not ratified by the United States Senate, the "modus vivendi" was continued in both Canada and Newfoundland. A special Act of Parliament was passed in Canada, authorizing it in 1890 and again in 1891, and in 1892 power was given the Governor in Council to authorize the renewal of the arrangement from year to year, and such has been done up to the present.

There were those who felt that this was a mistake on Canada's part, and that if she had, following the failure of the United States' Senate to ratify the treaty, held United States fishing vessels down to their bare liberties under the treaty of 1818, they could not have successfully competed with those of Canada. It was, no doubt, owing to a strong feeling in this direction that in 1904, when it was learned that United States fishing vessels which had installed auxiliary power

were taking out licenses, and were thus able to avail themselves of the privileges to a greater extent than had been originally contemplated, such vessels were declared by Order in Council to be ineligible for licenses. The effect of this is to render the privileges of the *modus vivendi* of less and less value to United States fishing vessels as the years go by, as more of them are installing auxiliary power.

In Newfoundland, following the failure of the United States Senate in 1905 to ratify the Bond-Hay Convention which provided for reciprocal arrangements between the two countries, that colony absolutely discontinued the "modus vivendi", and has since been restricting United States vessels to their liberties under the Treaty of 1818.

With the changing conditions, owing to the advent of cold storage and the development of the steam trawling industry, as well as the ever increasing growth of the fresh fish markets, obviously these privileges are not of the same vital importance to the United States that they were in earlier years, but they are still of great value, particularly to the vessels engaging in the salt fish industry, and as will be shown later on, with some modifications their value would be vastly increased to the United States.

All the above has reference to the Atlantic coast, but when the deep sea fisheries of the Pacific began to be developed, difficulties of a largely similar nature began to be experienced there.

The halibut fishery, which even up to the present time is the only deep sea fishery on that coast that has been extensively developed, was started from Seattle, but as the most prolific banks were off the British Columbia coast, and the C.P.R. afforded as good and as cheap transportation facilities to the markets of the United States as the United States railroads the New England Fish Company, the pioneer organization in the industry, opened a branch at Vancouver in the early nineties. At that time, the duty on fresh fish entering the United States was $\frac{1}{2}c$ a pound, and the company, owing to being able to operate more cheaply from Vancouver than Seattle, found it feasible to use Canadian boats in the fishery and pay this duty, and still more than successfully compete with Seattle. But in 1897 the United States tariff was raised to 1c a pound. The company then represented to the Canadian Government that unless it would allow it to use United States fishing vessels and ship their fish in bond from Vancouver, it would be unable to continue competition with Seattle, and would have in future to carry on its business wholly from that port.

After much hesitation, it was decided to grant these requests for that year only, but like the "modus vivendi" on the Atlantic, the privileges have been renewed yearly since that time.

As well as being allowed to ship their fish in bond, vessels bringing their catches to Vancouver for such purposes, were also permitted to purchase bait, stores, and outfits and to ship crews.

When a few years ago the G.T.P. was opened up to Prince Rupert, the situation became even more complicated, and the agitation for discontinuing the privileges altogether was very strong. Indeed, it would seem that the only thing that saved the privileges was the fact that the duty had been removed on fish into the United States. It will be readily seen that as long as the duty remained, this arrangement placed United States operators in British Columbia ports on a distinctly advantageous position as compared with Cana-

dian competitors, as while the former could ship their fish into the United States in bond and thus escape the duty, the Canadians had to pay a duty of 1c a pound. No doubt, in the earlier days this fact militated against the development of the Canadian fishery, though the selling organization of the American companies in the United States at that time made it extremely difficult to break into it.

In any event, when it was decided to renew the privileges of the G.T.P., it was also decided to meet the requests of the smaller individually owned United States' fishing vessels, which were not in a position to ship their own fish in bond, to sell their fish in bond in Canadian ports to duly licensed purchasers who in turn would ship them in bond to the United States.

As only vessels shipping fish or selling fish in bond were allowed to purchase bait, etc., representations were made on behalf of the United States' vessels to be allowed to come to Canadian ports and get bait on their way to the fishing grounds before landing a fare of fish, and this was granted conditional on the vessels giving an undertaking that the fish caught from such baitings would be taken to Canadian ports.

There were however, some "flies in the ointment" in the working out of the arrangement to the United States' vessels. They claim that it is particularly unfair to them to be made to give the undertaking above referred to, and that they should be free to bring their catches to Canadian or United States ports as they might find most desirable. Also, some Customs rulings were given in connection with shipments by water, which for a time seriously upset arrangements, but these have been revoked, and there is no difficulty now from that standpoint.

The yearly nature of the arrangement however, leaves the operators in doubt as to its stability, and, consequently, prevents the development of the business by them to the extent that they otherwise would feel warranted in effecting.

While, as on the Atlantic coast, the geographical position of British Columbia, and particularly of Prince Rupert, give advantages greatly above those offered by any Washington State port, or even by Ketchikan, owing to the latter being about one hundred miles away from a railway, the conditions on that coast are changing too. The richest halibut grounds off the British Columbia coast have already been seriously depleted, and for the greater part of the year the halibut are now mainly caught on banks well north of the Alaskan coast. Also, while as a usual thing, bait fishes are plentiful on the British Columbia coast, there are times when bait is found in the United States side when it is scarce in Canada, and it is therefore advantageous that our fishermen should be assured that at any time they may go to United States waters for baiting purposes if they desire.

There are several other matters of minor importance, but of distinct value, which space forbids dealing with at the present time, but it will be seen from the above that there are difficulties on both coasts. If the time for hair-splitting arrangements on either side ever existed, that time has fortunately passed. It is now generally recognized that what is needed is a well balanced arrangement that would be fair and just to both countries, and that would assure that stability which would encourage development in the industry all along the line by the fishermen of either country.

On the Atlantic coast, it would be of tremendous value to United States' fishing vessels having auxiliary power, if they could avail themselves of the "modus vivendi" privileges.

The value of these privileges to all United States fishing vessels would be vastly implemented if they were permitted to sell their fish in Canadian ports, even in the face of a duty, as well as to ship them in bond from such ports. Merely superficial examination reveals this. While these vessels would always go to the United States' markets under ordinary conditions, it too frequently happens that owing to inclement weather or running short of bait on account of poor fishing, vessels find it necessary to make for port with an insignificant fare. In such instances valuable time would be saved if the vessels were permitted to visit the nearest port, and there dispose of her small amount of fish which it would not pay to tranship, and then immediately refit and get back to the banks. Such an arrangement would in the aggregate, save months of fishing time to United States vessels, and would thus result in greatly increased food production and earnings.

Also, while the license fee is a serious matter for individual vessels, the revenue even if licenses were taken out by the whole United States' fleet would not be a matter of much importance to the Canadian Government, and the reduction of such fee to a merely nominal one therefore appears practicable.

On the other hand, Canadian vessels are not allowed to go directly from the fishing grounds to United States' ports with their catches and sell them there, but they must forward their fish through the ordinary merchantile routes. In years gone by, when they were permitted to go to such ports, they were not given clearance after disposing of their fish for the high seas, but they had to return to a home port.

While owing to the proximity of Canadian ports to the fishing grounds and the ready transportation facilities from such ports, Canadian fishing vessels would not frequently go direct to United States ports even if they were permitted to do so, there are occasions when they could go there with advantage, and at such a time no detrimental competition by them with United States vessels would be experienced as they would only go there because the demand would be greater than the supply.

An agreement on broad lines covering a long term of years, by which United States' vessels, no matter how propelled, — procuring licenses merely to recognize the over-stepping of treaty concessions to which licenses only a nominal fee would attach, — would be permitted on both coasts to come to Canadian ports to tranship or sell their catches in bond or locally, on payment of the duty, if they chose, to then replenish their stores and outfits, as well as ship crews and then be granted clearances for the fishing grounds, similar privileges to be accorded Canadian vessels in United States' ports, would in the opinion of the "Canadian Fisherman" greatly inure to the benefit of the fishing industry in both countries and would prevent difficulties arising which tend to cause international complications.

Such an arrangement would be eminently more reliable than one depending on tariff provisions, which are unstable and liable to change at any time. We trust that the negotiations will be successful in bringing some such settlement,

COMMISSIONERS TO DEAL WITH FISH FOODS.

Acting under Section 6 of the Order-in-Council creating his office, the Honorable W. J. Hanna, Food Controller for Canada, has appointed Messrs. G. Frank Beer, of Toronto; R. Y. Eaton, of Toronto, and F. S. Wiley, of Port Arthur, as Commissioners, having the same power as the Food Controller to deal with all matters concerning Canadian fish.

According to the above-mentioned Order-in-Council, the Food Controller for Canada possesses the following powers:

- (a) To make such inquiry and investigation as he deems necessary for the purpose hereinafter set forth into the quantities, location and ownership, and into the sources of supply of any article of food used by the people of Canada and into the prices at which same is sold or held for sale and the causes of such prices.
- (b) To ascertain the food requirements of Canada and to facilitate the export of the surplus to Great Britain and her Allies.
- (c) To make regulations where he deems it in the public interest and subject to the approval of the Governor in Council.
- (1) Governing the prices of any article of food and the storage, distribution, sale and delivery thereof.
- (2) Providing for the conservation of food and the prevention of waste thereof, and governing the consumption of food in hotels, restaurants, cafes, private houses, clubs and other places.
- (3) Respecting the manufacture, preparation, storage and transport of food.
- (4) Authorizing the Food Controller to purchase, requisition, store, sell and deliver food. For all the purposes of these orders, the Food Controller shall have the powers of a Commissioner appointed under the provisions of Part One of the Inquiries Act. All powers conferred and all duties imposed on the Food Controller by these Orders, or by any subsequent Order of the Governor in Council, may be exercised and performed by him either independently or in co-operation with any Department of the Government of Canada, or any Provisional Government, or with any Department or officer of the Government of Great Britain or of any Allied country vested with similar powers.

For every one dollar's worth of fish that is produced from our inland lakes, British Columbia and the Maritime Provinces produce six dollars' worth of ocean fish, and in view of the very special character of this business, we would have expected that at least one of the Commissioners appointed by the Food Controller

would have been a British Columbian or Maritime Province fisherman. However, the three Commissioners that have already been appointed will be given every facility and assistance by the fishing industry in the prosecution of their work.

BRITISH COLUMBIA COMMISSION.

In order to determine the best policy to adopt in connection with the Salmon Packing Industry of District No. 2, British Columbia, the Dominion Government have appointed a Commission composed of Mr. W. Sanford Evans, of Ottawa, Chairman; Mr. H. B. Thompson, of Victoria, and Mr. F. T. James, of Toronto, as a Commission to examine into the following matters:



W. SANDFORD EVANS, Ottawa.

1. Whether the number of salmon canneries allowed to be operated in district No. 2, British Columbia, should be restricted to the number of licenses for such establishments as are now effective, and if so, for what length of time.
2. Whether motor boats should be allowed to be used in salmon fishing operations in the said district.
3. Whether the number of fishing boats now allowed to be used in any area should be enlarged or reduced, (a) if motor boats are al-

lowed, and (b) if row boats only are permitted, and if so, how many in either case and in either direction.

4. Whether any of the boats authorized to be used in any area should be licensed to fish in connection with specified canneries only, and if so, what proportion of such boats.
5. Whether the export in a fresh condition of other varieties of salmon than sockeye should be prohibited, and if so, to what extent.
6. The actual amount of money in cash originally and at present invested in each cannery and equipment; the annual business done and the expenses connected therewith, and the gross and net annual profits or losses sustained by each cannery in the said district since the boat rating became effective, such informa-



H. B. THOMPSON Victoria, B.C., member of the recently appointed B. C. Commission.

tion to be obtained by the examination of witnesses under oath, or by an audit of the books or both, as may be found most desirable by the Commissioners.

7. Such other points directly connected with the salmon fishing and canning industries in this district as in the opinion of the Commissioners will better enable them to reach proper conclusions on the aforesaid subjects.

These gentlemen left immediately for the West after receiving their appointment, and are now on the ground making the necessary investigation.

Ontario to Use More Fish

May 15th, 1917.

Chairman, Ontario National Resources Commission.
Toronto, Ont.

Gentlemen:

As Editor of the CANADIAN FISHERMAN, Secretary-Treasurer of the Canadian Fisheries Association, and a member of the sub-committee appointed by you at the meeting on Monday, May 14th, I would make the following personal recommendations and suggestions for the utilization and larger consumption of Ontario fish among the citizens of the Province.

FIRST. EDUCATE THE PEOPLE TO THE VALUE AND ECONOMY OF FISH AS A FOOD

This can be done by **ADVERTISING** and **DEMONSTRATION**.

Advertise in newspapers and magazines which reach the home and the house-wife. Enumerate the species of edible fish which Ontario waters provide. Urge the people to eat more fish. Separate fish from Friday and encourage its consumption three and four times a week at least. Have the ads. designed showing the fishermen hauling the nets, etc., and have the wording telling, forceful and calling attention to the urgent necessity of using our natural resources to the limit in these war-time days.



WITH every advertising contract given, supply a series of reading notes and fish recipes which must be published in the "Home Notes" or "Women's Page" of the newspaper or magazine receiving advertising. Ask the editors to write editorials on the subject of using more fish in place of meat, eggs and poultry.

Have a small pamphlet printed giving a list of edible Ontario fish; their food value; how to dress them; and how to cook them. **AVOID RECIPES** with ingredients which are costly. **AVOID RECIPES** which call for much preparation and attention. The simpler, the better. Have this book bound by a saddle stitch so that it will remain open at any page. The cook may want to have the book in front of her while preparing the fish, and she won't be bothered with a book that persists in closing up like the booklet produced by the Department of the Naval Service. **THIS BOOKLET SHOULD BE SUPPLIED TO ALL DEALERS IN FISH**, wholesale and retail. Let them mail it to their customers and have it upon their counters. Also have it distributed in the rural districts through the local postmasters.

Have a small poster designed for display in fish stores. It should be of stiff cardboard—not too large and not too small. The design could be a string of white-fish, trout, herring, etc., with the outstanding words, "EAT MORE FISH AND KEEP DOWN THE COST OF LIVING. IT IS A NATIONAL DUTY." Or "UTILIZE HOME RESOURCES. EAT FISH AND SAVE MONEY. CHEAPER THAN MEAT."

Circularize the fish dealers and urge them to aid the Commission in increasing fish consumption. Ask them to advertise locally. Urge them to make good displays on both Tuesdays and Fridays, and get them to take care in displaying and handling fish-foods. Get them to give prominence to the poster in their windows and on their delivery carts and wagons. Have them distribute the cook book to their customers. As many

fish dealers are butchers also, it may be policy to leave out the "cheaper than meat" slogan.

IN ALL PUBLICITY WORK remember there are seasons when certain lines of fish are dear. Advertise the fish in season and make the public acquainted with the seasons and the varieties plentiful.

Endeavour to popularize species of Lake fish which through appearance and prejudice are not generally consumed. Eelpouts, catfish, carp, sturgeon, etc., are all first-class edible fish and are largely consumed in the United States. There is no reason why they should not be in Ontario.



DEMONSTRATION. One of the best means of practical demonstration is through the domestic science classes in colleges. If the students are taught how to cook fish, they will carry the knowledge home and spread the gospel. Demonstration booths in charge of a good cook can be established for a week or so in the fish department of large city stores. Have the restaurants and hotels feature fish on Tuesdays as well as Fridays. The Tuesday Fish Day was originated and given much publicity by the **CANADIAN FISHERIES ASSOCIATION** and it has been very successful in many localities. Most of the dealers throughout the country know of the Tuesday fish day, and the Association is still keeping the idea alive and will continue to do so until it is universally adopted.

The idea of a railroad car as a demonstration booth as mooted by Mr. F. T. James of Toronto, is a good one and would be invaluable for promoting the fish eating campaign in the rural districts.

For the benefit of the store-keepers in country districts who find it hard to stock fresh fish in the summer-time, I would suggest that they be supplied with a glass topped show-case, lined with zinc and capable of holding 50 to 100 lbs. of fish. The Dominion Department of Fisheries advocate this idea and had sample cases made and tested. One of our Montreal dealers has had 150 cases built and is loaning them to his customers in the rural districts of Quebec. The fish are laid in ice in this case and the whole makes a tasteful display. Particulars of this case are appended, and the Ontario Government might supply these cases with suitable legends stencilled on them urging the eating of more fish.

SECOND. SUPPLY. In my opinion, which may be open to correction the demand has to be created first. Create the demand and the supply will take care of itself. Our fishermen will ship to the Ontario markets just as readily as they will to the American. The U.S. market has proved a good one for Ontario fishermen in certain localities both in price and quantity bought. It is less trouble to ship 1000 lbs. than 100 lbs. and that has been the reason in the past. With a good market in Ontario, the supply will follow, and during these war-time days it would be a good move to ease up on the Provincial fishing restrictions and open up many closed lakes and waters. This will tend to lower prices. The fishermen and producers could be appealed to increase production and ship to both markets. We must not forget the fact that the United States are now our Allies and any discrimination against them would be unpatriotic and lead to retaliation. Our joint resources are now being pooled for the common good.

THIRD. It is probably within the scope of the Commission to advise regarding the future of the fisheries. Following an increase in **CONSUMPTION** and

PRODUCTION, there must be **PROPAGATION** to make good the loss. This can be done by the establishment of **FISH HATCHERIES** under competent fish culturists in order to preserve the fisheries and maintain the supply. The fishermen and the producers will gladly co-operate with the Government in this work.

FOURTH. Utilization of Fish Waste. Enormous quantities of fish offal are thrown away in our fisheries. Great quantities of this could be utilized for fertilizer, cattle feed and oils at very little expense. Mr. J. B. Feilding, F.Z.C.—an expert upon this subject—has made a number of experiments in the manufacture of waste fish products on the Lakes for the Conservation Commission, and I would suggest that your Commission get in touch with him. His address is Barrie, Ont. An editorial by myself on this subject is attached for your perusal.

I would suggest that your Commission work in harmony with the Head of the Lakes Branch, Canadian Fisheries Association, Mr. T. Craigie, Secretary, Fort William, Ont. Lake Erie Fishermen's Association, Mr. Chas. Finlay, Secretary, Port Stanley, Ont., affiliated with the C.F.A. Mr. F. T. James, 29 Church St., Toronto, Ontario Director, Canadian Fisheries Association—all of whom were present at your session on Monday.

Needless to say, both the **CANADIAN FISHERMAN** and myself will do everything possible to aid the cause of fish production and consumption in Ontario.

The whole respectfully submitted.

ACADIA GAS ENGINES, LTD., HAS HAD REMARKABLE GROWTH.

The Acadia Gas Engines Limited, is not unfamiliar to people doing business in the fishing districts of the Maritime Provinces and Newfoundland, for the products of the concern are so well known along our coasts that it is hardly conceivable the existence of the company can have escaped the notice of business men. And yet we imagine many will be surprised to learn of the dimensions to which this industry has grown in eight



W. T. RITCEY.

years. W. T. Riteey, the founder, is a native of the South Shore, who spent many years in the United States. Being in need of a change for the benefit of his health he came back to Nova Scotia to enjoy a short holiday, and as he had the agency for an American Gas Engine and found that there was field in this country, he conceived the idea of doing a little business on the side for himself. The opportunity opened up so well before him that presently he decided to engage in the business of producing gas engines in Bridgewater. Associating some others with him, a joint stock company was formed with an authorized capital of \$50,000. Of this amount \$12,400 was paid in. The first year's sales amounted to \$7,000; last year they reached over \$250,000.

The Acadia Gas Engines, Limited, is a reorganization of the firm of the Acadia Gas Engine Company, Limited, which was organized in 1908 with a paid in capital of \$12,400, and although the capital was then so small, the company has since become and enjoys the distinction of being the largest manufacturers of Two-Cycle Engines in Canada. The growth has been somewhat phenomenal, and has been due largely to catering to the needs and requirements of the trade, and also to the simplicity and working qualities of the products manufactured.

The business of this company consists principally in the manufacture of internal Combustion Engines for the use of fishermen, and also Power Winches for Hoisting of sails and cargo, and the heaving of anchors, etc., on schooners.

Part of its organization consists of Local Representatives all along the seaboard of Eastern Canada. Labrador, and Newfoundland, and in the latter Colony an Office and Warehouse have been established, where a complete stock of engines and accessories is carried.

The main buildings of its plant consist of factory and foundry buildings which are most thoroughly built, covered with asbestos slate shingles, equipped with automatic sprinkler systems, elevator, and modern machinery especially adapted to the manufacture of its product.

The plant is situated on the bank of the LaHave River, and has a large pier and warehouse, and the facilities for the discharge of cargoes are excellent.

The prospects and future of the old company were so bright and the growth so rapid that it was impossible to make the necessary additions, and to carry the increased stock and volume of business without additional capital, and therefore a reorganization was effected and bond issue has been made, which is to be used partly for additional equipment, but principally to take care of the future increase, which is sure to come, if the business of the past several years can be used as a basis.

The company also anticipates manufacturing new lines, which will increase the field, and there are yet greater possibilities and opportunities of increasing the business in the fields now being canvassed, as much of it is only being slightly skimmed on account of more business being offered than can be handled. Each year recently, many orders have been cancelled, and it is figured that this additional capital will make these cancellations unnecessary.

The first four months of this year show an increase of 34 per cent over last, and the months of January and February are months that do not reach the average. The present year promises to be the largest and most successful in the history of the company.

PRESERVING FISH WITHOUT ICE OPPORTUNITY FOR THE SMALL PRODUCER.

"Sherman's" Fish Sterilising Co., Ltd., 1416 Standard Bank Bldg., Vancouver, B.C., is the owner of the Henderson Process for preserving fish without ice.

A. H. Sherman, proprietor of the Defiance Packing Co., is the Britisher who introduced this process into Canada, being impressed with its importance from the fact that the Board of Agriculture and Fisheries, 43 Parliament Street, London, England, reported in February, 1917, that "there appears to be no ground for doubting Mr. Henderson's claims as to the practicability of the process on a commercial scale." When a British Government Board puts its seal of approval on a fish preserving process, it is good enough for all Britishers, is Mr. Sherman's opinion.

Many tests with an experimental plant have been carried out in Vancouver, and their results have been satisfactory to all concerned. After a recent test, Mr. Sherman received the following unsolicited testimonial from Edward G. Taylor, Inspector of Dominion Fisheries, Nanaimo, B.C.

"The test proved entirely successful and the process was exceedingly simple, and no ice was used at any time during the process. I also ate salmon which had gone through this process, and had been out of the water for fourteen days, and this salmon was just as fresh and firm as if it had been taken out of the water that very day. The bone of the salmon was strong, sound and sweet, proving conclusively that the Process was entirely successful in preserving fish without ice for at least fourteen days, and from what I have seen, I have no doubt it would keep a very much longer time. I believe the process will be a great boon to the country and be an immense factor in the development of the fishing industry.

Some of the processed fish was expressed to W. A. Found, Department of Naval Service, Dominion Fisheries, Ottawa, and he wrote after sampling it: "There was nothing in the taste of either fish that suggested to me that they had not been cured immediately following their being landed."

It is claimed by the owners of this patented process for preserving fish without ice, that because no ice is needed the cost of preservation is lessened, and therefore the fish can be sold cheaper.

All the original flavor of the fish is maintained. The process applies to fresh and smoked fish, and also to meats, with which successful tests have already been made.

The whole process from start to finish takes only three hours. Salt, low temperatures and sterilization are salient features of the process. First the fish is put into a cooling tank filled with water and brought to a low temperature. In half an hour the latent heat in the fish is extracted gradually and entirely. Then the fish is put into a second tank of sea water or fresh water strengthened by the addition of salt. In order to prevent freezing the water is agitated by a pump which draws it off through one pipe and drives it back again through another, passing through a filtering chamber charged with willow charcoal to kill the germs. The extremely low temperature of the salt solution seals up the pores of the fish and prevents saturation, acting as an antiseptic protection on the outside. After three hours the fish is taken out and presents a fresh appearance. It is impervious to decay for ten days, and may be kept in a cool room for months.

Robert Mann, Superintendent of the Henderson Process Plant at Dock St., Fleetwood, England, who installed the first plant at Lisbon (Portugal) writing under date of February 28th, 1917, of the Process of the Fleetwood Plant days:

"I cannot speak too highly of the great success of this plant. Treated fish kept in excellent condition for a fortnight or longer in changing weather, the flavor being equal to that of newly caught fish; it never becomes flabby as in the case of fish that has been on ice. It is also admirably adapted for use in connection with smoked fish being first treated and then smoked. It keeps for a much longer time, especially in hot weather and has a better flavor."

Mr. Sherman sees great possibilities in this Process for it is cheap to install and it will give the small producer of fish a means of preserving his catch so that he may reach the distant markets with his fish in good condition. He considers this process will not antagonize the cold storage companies, but will supplement the work they are doing in increasing the production of fish.

"Who's Who and Why," gives the following references to the three gentlemen who have been appointed by the Honorable W. J. Hanna, Food Controller for Canada, to look after all fish matters:—

BEER, George Frank.—Born at Bedeque, P.E.I., January 12, 1864, son of the late John Beer, M.P.P., of Charlottetown. Educated public school and Prince of Wales College, Charlottetown. Partner of Beer Brothers, General Store, Charlottetown, 1886-1897. Partner Beer Brothers, Financial Agents, Nelson B.C., 1897-1900. Treasurer Eclipse Whitewear Com-



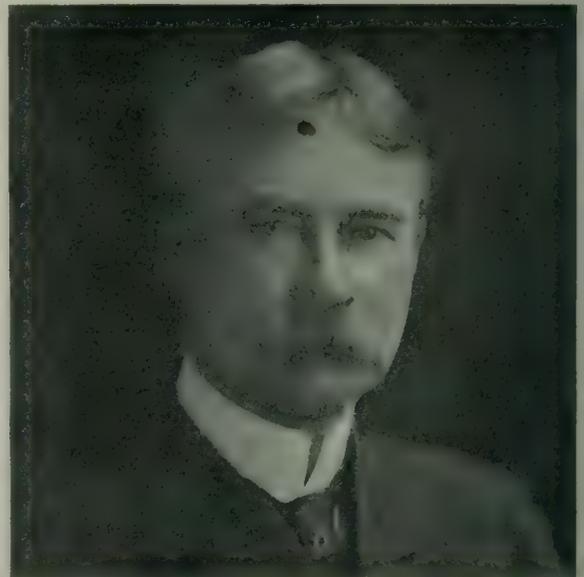
MR. G. FRANK BEER, TORONTO.

pany, Toronto, 1901-1913. Retired from business 1913. President Toronto Housing Co., Limited; Vice-President, National Housing Association of America; Director, Toronto Playground Association; Member Executive Toronto Red Cross Society; Member of Committee appointed by Conservation

Commission of Canada to draft model city plan bill for Canada; Honorary Treasurer of Commission appointed by Ontario Government to build Toronto-Hamilton highway; Member of Commission appointed by Ontario Government upon Unemployment; representative Ontario Government at Imperial Health Conference at London, England, 1914.

EATON, Robt. Y.—Vice-President, T. Eaton Co., Toronto and Winnipeg. Born Ballymena, Ireland, nephew of the late Timothy Eaton. Educated Ballymena, Ireland. Came to Toronto when 22.

WILEY, Franklin Samuel—of Wiley & Co., and Thomas Marks & Co., President Canadian Northwest Steamship Co., Ltd.; Vice-President, Lake Coast Trading Co.; Secretary, Thunder Bay Harbour Improvement Co.; President, Port Arthur Board of Trade,



MR. F. S. WILEY, FORT WILLIAM.

three years. Born Penetanguishene, Ont., May 17, 1859, son of late Captain Thomas and Maria Marks-Wiley. Removed to Bruce Mines, Ont., 1870, where was connected with firm of Thomas Marks & Brother, established there, 1856; joined firm of Thomas Marks & Co., Port Arthur, 1871, and has been connected with that firm since then in lake carrying traffic and jobbing trade. Member of Board of Governors, Toronto General Hospital.

SUMMER FISHING.

St. John's, Nfld.

Several hundred Newfoundland schooners have sailed for the Labrador coast on their annual fishing expedition, which will last all summer.

The number engaged is somewhat less than usual, as the high cost of provisions makes the fitting out of two vessels as expensive as the supplying of three in ordinary years.

Maine sardine packers at Eastport recently paid \$80 per hogshead for fish. This is just four times the normal prices a year ago. What will Maine sardines cost the ultimate consumer this year?

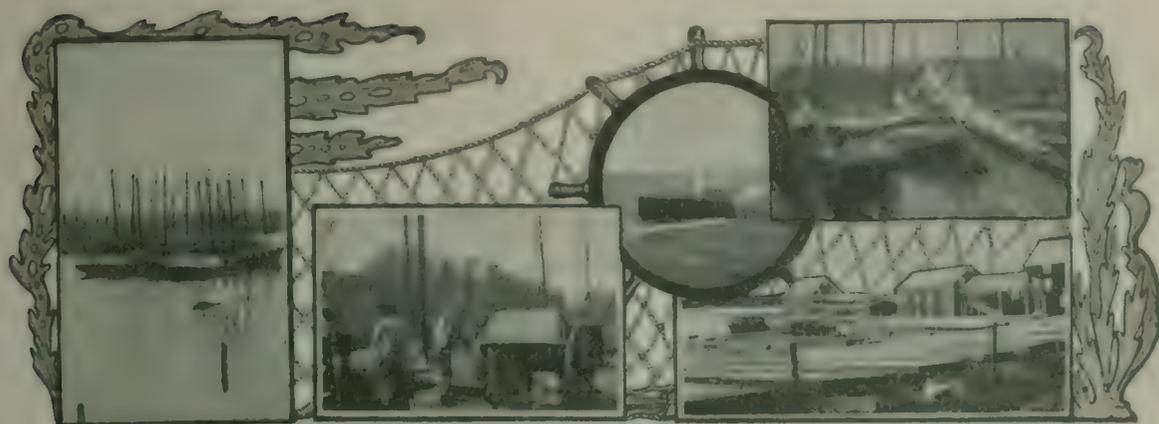


J. H. PAULHUS, Esq., Montreal
Director of the Canadian Fisheries Association and Chairman of its Educational and Publicity Committee.



F. T. JAMES, Esq., Toronto

Director of the Canadian Fisheries Association, who has been appointed by the Dominion Government one of three Commissioners to enquire into the conditions of the Salmon Canning Industry in District No. 2, British Columbia.



Canadian Oysters

J. STAFFORD, M.A., Ph.D., Montreal.



IN CANADA there are two species of oysters: The large one found on the eastern coast and the small one on the western coast. The large species is known across the breadth of Canada, and is shipped in car-loads and transplanted on the Pacific coast. The small species is for the most part unknown over the greater portion of the country to the east, but is well known and much used in the west.

In the United States there are the same two species, similarly distributed, but in greater abundance and more extensively used as an article of food.

All the oysters from Canadian waters are shipped and sold fresh—in the shell—and few go outside of Canadian territory. United States oysters, on the other hand, come into Canada in the shells as well as in bulk—with the shells removed. The first are served fresh, on the half shell; the second are used extensively for soups, fries, and in other ways. The rich nutritiousness and delicate flavor of the oyster always cause it to be sought after on the menus of hotels, restaurants, and the meetings of societies; yet in this country at least it must count as a luxury, never or rarely making its way to the tables of the masses.

The oyster was known and esteemed in ancient times and has been praised throughout mediaeval and modern ages. At the time of Julius Caesar it was cultivated in Italy; and had been transported from the coast of Britain, in fact, it has been hinted that it was the oyster that lured Caesar to the shores of England.

Throughout this vast period there have been numerous contributions to the literature of the oyster, many or most of which are of little or no value, but are still of interest as showing the simple and quaint thoughts, customs, or methods of our ancestors. At the present day the sight or the mention of an oyster is sufficient to bring any ordinary man to the position of attention and most people are fertile in enquiries about every phase of the subject.

In recent times our knowledge has been so far extended that it is difficult to include even the main divisions of the subject in the compass of a single article without overtaxing the patience of the reader. There is the oyster itself, meaning its organization and its activities, including its manner of living; then there

is its mode of origin; a third department is the surroundings among which it lives; and in the last place we may mention its methods of culture, leaving trade and commerce and uses and many other subjects to be filled in by the general knowledge of the reader.

Organization and Activities.

That the oyster is an animal distinct from other species, has doubtless been recognized as long as the animal has been known, but double names to distinguish one species from another were first introduced by Linnaens (1707-1778, from 1762 written Linn), a professor in the university of Upsala in Sweden. Before his time such common animals as were known were called by common names such as "the edible oyster." Linnaens gave double Latin names to the animals known to him. For the oyster his name was "Ostrea edulis," which means the same as the common name, ostrea being the Latin word for the older Greek name of the oyster, while edulis is Latin for eatable. The first word of the double name is the name of the genus and the last is the name of the species.

After the oyster of the eastern coast of America (Figs. 1, 2) came to be known, it was soon regarded as sufficiently different from the European oyster to warrant its being looked upon as a different species and it was called *ostrea virginiana*, after the common name used by Lister (1638-1713, physician to Queen Ann), and later *Ostrea virginica* by Gmelin (1748-1804, professor in Tubingen), who edited the 13th edition of Linnaens' great work *Systema Natural* (*System of Nature*). The name appears to have been first given to the long narrow variety of the American oyster, and later Lamarek (1744-1829, professor in Paris) recognized the shorter and broader variety, which he named *Ostrea borealis*, and another variety not very clearly distinguished from the other two, which he called *Ostrea canadensis*. These are only form varieties, not different species. They all agree in structure, habits and manner of breeding, but they differ from the European species. In still more recent times the common oyster of the Pacific coast (Fig. 3), has been discovered and come to be named *Ostrea lurida* — the name given by Carpenter (1820-1877, Montreal), although the older name *Ostrea columbiensis* of Hanley, is more proper. This is quite distinct from the At-

lantic coast oyster and is much more closely related to the European species.



THE eastern oyster occurs at intervals from the Bay of Chaleurs to the Gulf of Mexico. It is often called by special local or trade names such as Caraquette, Malpeque, Cape Cod, Blue Point, etc. In a similar way the western oyster is often called the Olympia oyster. It occurs at places on the coasts of British Columbia, Washington, Oregon, California, and continues farther south.

The most superficial character of any species of oyster is the shell, which is composed largely of the same chemical material as limestone. It is in two pieces (valves) held together at one place by a hinge, which

differ. The hinge end is anterior and the end to the left is posterior, the far edge is dorsal and the near edge is ventral. The soft parts along the ventral edge are separable into six leaf-like structures, (Figs. 5, 6) lying parallel with and just inside of the slit along which the two valves separate or gape. The outermost leaf, that lying against each valve, is the mantle, and fits over the body of the oyster in much the same way as a man's coat does over his body, but with this difference, that the mantle of the oyster is an integral part of its living flesh. It is the thickened edge of the mantle that is responsible for building out the growing edges of the shell. The other four leaves are the gills—two on each side of the median longitudinal line, but each pair in reality representing a single gill, one belonging to the left and the other to the right side of the body.

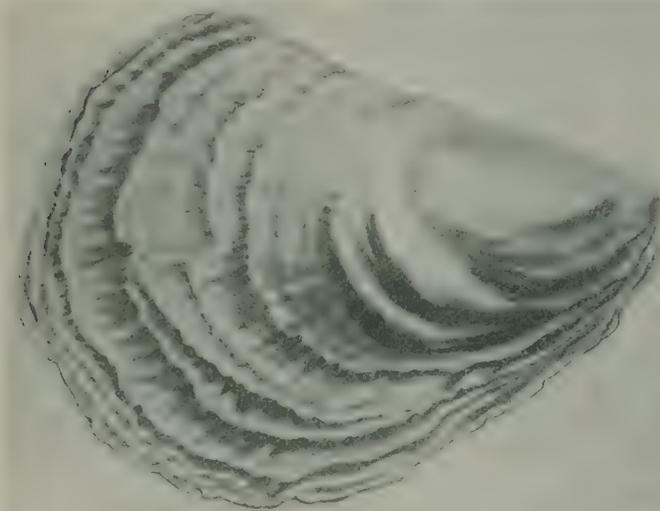


Fig. 1.—*Ostrea virginiana*, short variety, from Malpeque, P.E.I. Reduced from the natural size.

permits the opposite edges to diverge to allow the entrance of water and food, and the exit of waste matters. Each valve is marked by semi-circular creases, that serve to exhibit former sizes and shapes of the growing oyster, but there are periods of rapid and of slow growth. The shell is not a living part of the oyster, but is of a similar nature to our nails, serving a similar purpose, viz.: protection of the parts covered. It is built out at the edges as the body of the animal grows inside. One valve is larger, heavier and deeper than the other and in the natural position of the oyster should lie underneath; this is the left valve.

When the smaller right valve is carefully removed the soft body of the animal with its appended parts can be observed (Fig. 4). Perhaps the first distinct part to attract attention is a large, strong muscle situated just behind the centre of the animal and attached at both ends to the opposite valves of the shell. It is this that offers resistance in opening the shell. It used to be called the heart by fishermen, but that is a wrong name, for the oyster has a true heart situated in a little transparent spot just in front of the muscle, and in the freshly-opened oyster may be seen to slowly pulsate.

Placing the oyster with the straight edge of the shell away from you and the smaller (hinge) end towards your right hand, it will be seen that the two ends differ from each other and the near and far edges also



Fig. 2.—*Ostrea virginiana*, long variety, from Connecticut, transplanted and grown at Crescent, B.C. Natural size.

It will now be plain that the oyster is not a shapeless mass of soft flesh, but that there are distinct parts or organs, each of which has some special work to do in the life of the animal. A closer examination of the gills will show transverse creases and minute slits through which sea-water is filtered and brought into close contact with blood-vessels connected with the heart. In this way oxygen can be given to and impurities removed from the blood.

But the gills have another use. Their surfaces are covered with little hair-like processes that, by their flapping movements, not only keep fresh supplies of water passing over their surfaces and into their pores, but also bring in the food of the oyster. This consists of vast numbers of minute plants, called Diatoms, that live suspended in the water, and it is by the filtering process of the gills that these can be separated out from the water and passed forwards to the mouth. The mouth is situated between the anterior edges of the



Fig. 3.—*Ostrea columbiensis* (= *O. lurida*), native of Boundary Bay at Crescent, B.C. Natural size.

mantle, just behind the hinge, and is guarded by four palps that look something like small gills, the two outer being in reality anterior and connected in front of the mouth, while the two inner are posterior to it. The collected food matter is pushed forwards from the gills and is directed by the palps into the mouth. There are no teeth, but there is a gullet, a stomach with a liver, and a long coiled intestine, the latter opening posteriorly, just above the adductor muscle, and permitting the undigested waste matter to be carried off by the current of water flowing away from the gills.

There is an excretory organ situated just below the adductor muscle, a nervous system that connects and controls all parts of the body, and a reproductive system that gives rise to eggs for perpetuating the species.



WHILE the oyster has an anterior and a posterior end, a dorsal and a ventral edge, and a right and a left side, yet it is not a locomotory, but a fixed animal. It is normally attached to a rock or to another shell by its left valve, which explains why the two halves of the shell, as well as to a less extent the soft parts, are not equally developed. In free, locomotory relatives of the oyster, such as the clam, there is a muscular outgrowth of the median

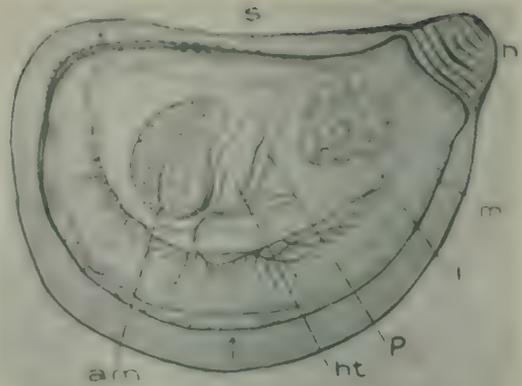


Fig. 4.—*Ostrea columbiensis*, from the right side with right half of shell removed, showing edge of mantle (m), heart (ht.), adductor muscle (am.).

ventral part of the body, the so-called foot, which can stretch forwards outside of the shell and by means of which the animal can creep about, turn itself over, and dig itself into the mud or sand. The oyster can do none of these things, but on the other hand it is well adapted to the mode of life it pursues. The absence of a foot, the slight lob-sidedness of the body and shell, and the habit of fixation show that it must have been a long time since the ancestors of the oyster were as active and as symmetrical as a clam. Yet the presence of single median organs like the digestive canal and the heart and of paired lateral organs like the mantle and the gills point towards an ancient bilateral symmetry of structure such as is possessed by all good runners or swimmers. Sprat (1669) wrote "The Oysters when the tide comes in, lie with hollow shell downwards, and when it goes out they turn on the other side; they remove not from their places unless in cold weather, to cover themselves in the Ouse." This was of course all wrong and Sprat must have got his information second-hand or conflicted some of the habits of the clam or cockle with those of the oyster. Yet there are many people of even the present day who have just as erroneous notions. I have sometimes been asked by summer visitors at the seaside where they might go to "dig" some oysters. Others again, seeing a float in which were temporarily kept a few

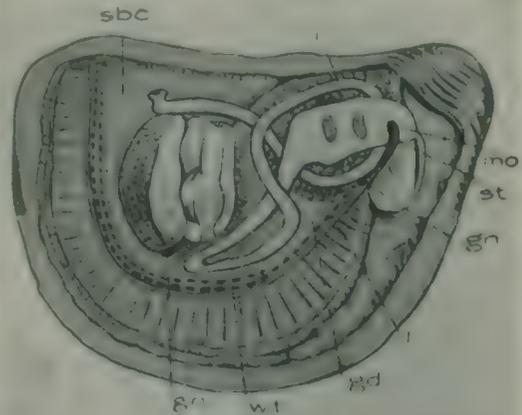


Fig. 5.—Same with right half of mantle removed, showing course of intestinal canal from the mouth (mo) through the stomach (st.), and backwards to the vent above the adductor muscle, the striated gills curving from below backwards and upwards, the reproductive organs (gd.), &c.

oysters for convenience in filling orders, remarked to the manager of the company, "Oh, I see, this is where you raise your oysters!"

Oysters cannot live very long if kept in a great heap, at least the under ones can not. In old beds along the Atlantic coast there is often a depth of several feet of shells, but the only oysters living are on the surface. The newer generations have built on the shells of the

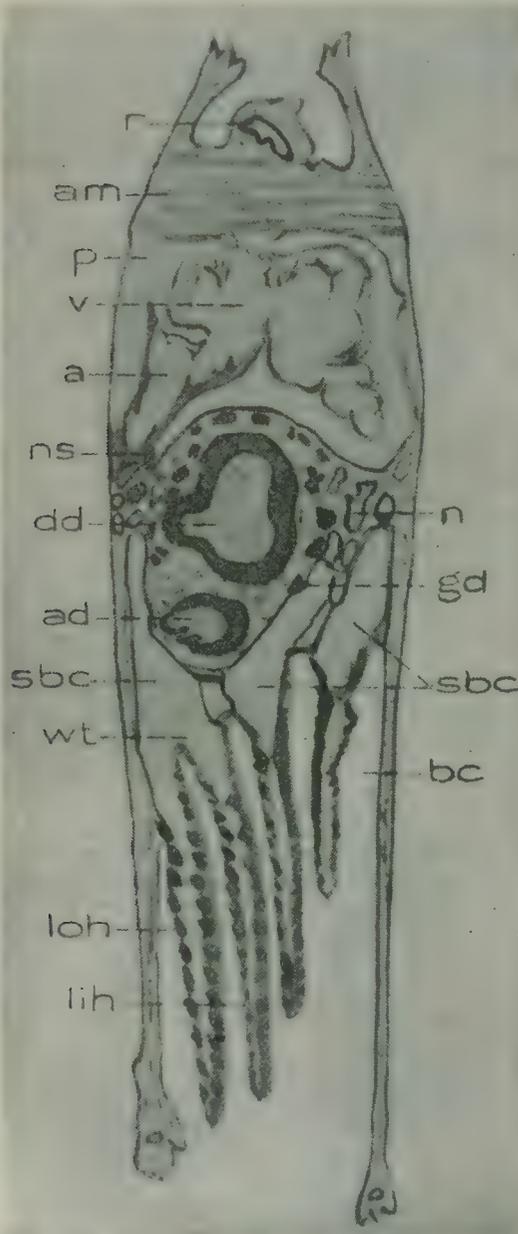


Fig. 6.—A cross section of the body of the same in the region of the heart (v.), showing a bit of the muscle (am.), the intestine (r., dd., ad.), the reproductive organs (gd.), the gills (loh, lih), and their cavities (sbc., wt.) containing water.

older, which either died naturally of old age or were smothered or starved by the deposit above them. The surfaces of these beds are usually eight to twenty feet below the surface of the water. Many oysters become broken away free from the mass and are tumbled about by strong currents. Many live singly or few in a bunch, attached to a stone or other solid object or broken loose. Those that are transplanted or that are brought into commerce are separated from each other.

OCCUPATIONAL DISEASES AND VOCATIONAL HYGIENE.

A subject of great interest to everyone engaged in industry or commerce, is that of Occupational Diseases and Vocational Hygiene.

It has been a well understood fact, for hundreds of years, that every particular occupation has its own particular diseases, and a book recently published under the editorship of George M. Kober, and William C. Hanson recalls our attention to this in a very forcible manner.

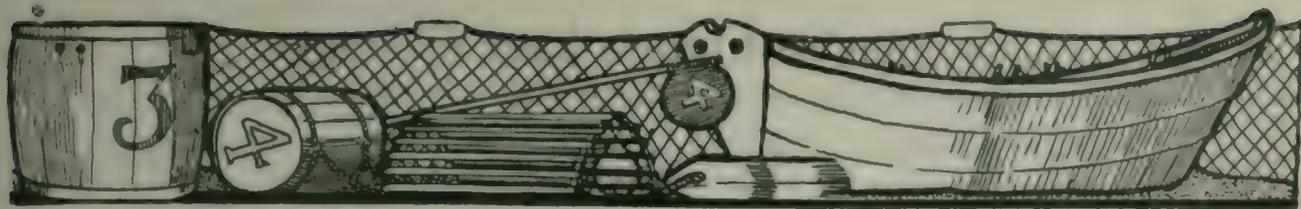
The life of the seafaring man is usually regarded as a healthy one, even if somewhat hazardous. It compares very favorably with other occupations, standing eighth in the list of twenty-two occupations tabulated.

The sailor's greatest enemies are darkness, dampness, insufficient air space in sleeping quarters, irregular meals and sleeping hours, exposure to extremes of heat and cold, hard work and accidents, especially during storms. As a result we see an undue prevalence of injuries, diseases of the respiratory organs, rheumatic and neuralgic afflictions. Heat exhaustion is not an uncommon trouble in the tropics. Fortunately, alcoholism is dying out, and the general mortality rate is rapidly decreasing.

The off-shore fisherman has many advantages over the deep water sea-goer, in as much as he has a more settled abode, with all that means in the way of a home life and home comforts.

The work of fish curing has some special interest because of the employment of a large number of women, and also because during the herring season it involves long and irregular working hours. Rheumatism, bronchitis, and diseases of the lungs are the penalties. Severe cuts, slow healing, and septic wounds are frequent. In days past, the very ground on which the workers stood was a menace to health, for in the absence of proper paving and drainage, the earth became impregnated with decaying organic matter, which created a constantly foul atmosphere that was not completely counteracted by the open-air surroundings.

The hygiene of the industry has been wonderfully improved since the establishment of modern canneries, and while primitive methods still prevail in the curing of herring and cod in a few backward district, the handling of most of the sea food is now carried on under most favorable working conditions. As time goes on, no doubt there will be still greater improvements, for while there is a growing demand that food which is to be placed on the market shall be prepared under strictly hygienic conditions, there is also the demand that no one shall work under conditions that are injurious to health, or that will impair the efficiency of the worker. Special attention is being given to the construction of buildings. Cement floors with wooden lattice work for the workers to stand on are being placed. Good ventilation for the removal of bad air is arranged for, while rubber aprons and boots are becoming better appreciated. Much of the work is now being done by machinery, and the methods for the collection and utilization of the offal have been perfected so as not to create a menace to public or private health. Altogether, the fishing industry is being made very attractive, and it would not be surprising, later on, to see a large influx of both capital and labor into the business.



Utilization of Fish Waste

Messrs. The Canadian Fisherman,
Montreal, Que.

Gentlemen:—

In one of your issues recently we notice that you called attention to the enormous waste which appertains in modern fish packing factories because of the absence of means for handling waste fish and fish offal. We are entirely in agreement with you. The waste is appalling. The matter is of such large public utility and benefit that we are glad to note the advice contained in your article that the Canadian Fisheries Association are taking the matter up with the Marine and Fisheries Department with the request for an investigation. We desire, however, to correct the impression which may be given by your article that there is no proper equipment for handling this problem and that the investigation will necessarily require large appropriations and the services of skilled investigators. As a matter of fact this problem has already been effectively overcome and a large number—upwards of fifty—fish packing companies are now equipped with apparatus. The firms so equipped are however, situated in Great Britain, South Africa, Australia and New Zealand. None have yet been furnished to American or Canadian fish packing companies for though we have sought to interest people on this side in the matter, we have not come across a firm sufficiently interested or enterprising to take the matter up. Perhaps they are making so much profit that they do not need to look for further returns!!

The method by which this problem is best overcome is by our "SCOTT" Gasoline Oil Extraction Plant which we have specially adapted for the handling of waste fish and fish offal. In this adaptation of our "SCOTT" Extraction Plant we take the wet fish and fish offal just as it comes and put it into the extraction vessel and without any intermediate apparatus we extract the oil therefrom and turn out the residue in a fine bone dry powder eminently suitable for fish meal or fertilizer purposes. The best market for the oil extracted residue is to dispose of it as fish meal to cattle and poultry food makers. That this was the view taken by the British Board of Agriculture even several years ago as instanced by the fact that they issued a special pamphlet directing the farmers' attention to the advantages accruing from the use of this material for feeding stock and the result has been that the product has been extensively taken up for that purpose. Owing to the fact that this oil has been removed the keeping properties of the fish meal are indefinitely better than appertains in the case of ordinary dried fish scrap.

For fertilizer purposes the extracted residue is also very much better because owing to the fact that the oil

has been removed the residue is in very much better condition for fertilizer purposes as the oil in ordinary dried fish scrap is a deterrent to its absorption into the ground and not only that but the presence of the oil in ordinary fish scrap makes the ordinary fertilizer ferment, or go sour, because the oil is acidified on exposure to the air. This is entirely avoided by the product from our machine because the oil is eliminated. By our method of removing the oil all the nitrogenous values are retained and the percentage of ammonia etc., obtained is therefore higher.

When the extracted residue is to be used for feed purposes the fish meal is usually finished off leaving not more than 3% of oil in the dried residue but for fertilizer purposes the oil is extracted even further.

The ordinary size of extractor deals with about 10,000 lbs. in about twelve hours. We are however, making extractors of larger size, say up to about 18,000 lbs. but the operation takes proportionately longer in the larger machines so that there is not much gained by increasing the size of the extractors.

The plant is extremely simple and is operated by ordinary intelligent unskilled laborers.

We should like to make a suggestion how this problem of equipment for handling waste fish and fish offal can be most advantageously conducted. It is that the material should be collected and disposed of at a central plant—run perhaps on co-operative lines. Each central plant would be able to take care of the material obtained from a certain locality. Such an arrangement would avoid duplication of equipment and it would be to the interest of the packing companies to send their waste fish and fish offal to the central plant for extraction.

One reason advanced to us by American-Canadian packing companies has been that the season is short but that seems to us all the more reason why it is necessary to get all there is from the fish while the season is on. You correctly mention in your article the waste is colossal. The profits are so large that even though the season be short the return on the investment is very high and in fact a few months working would be all that would be necessary to return the full amount of the investment.

We shall be very pleased to furnish the Canadian Fisheries Association or the Marine Fisheries Department with full information concerning the installations which we have installed for this purpose and to assist them in any way in their investigation of this important matter.

Yours faithfully,

ERNEST SCOTT & CO.
F. C. AUSTIN.

Judgment re Frozen Fish in England

Judgment—"Frozen" Not "Fresh" Confirmed.

In the Court of Appeal, on the 27th ult., before Lord Justice Swinfen Eady, Lord Justice Barnes, and Mr. Justice Bray, judgment was given in an appeal by the Midland Railway Co., against a judgment given in the Divisional Court, at Leicester (vide *Cold Storage, Apl. and Dec., 1916*) in favor of Messrs. William Warner's Sons & Co., Ltd., affirming a judgment of a County Court judge.

Mr. G. J. Talbot, K.C., and Mr. Frank Gover appeared for the appellants, and Mr. H. Holman Gregory, K.C., and Mr. F. Hinde appeared for the respondents.

Judgment.

Lord Justice Swinfen Eady said: The point raised is a short one, but one which is by no means free from difficulty. The question is: within which class, for the purpose of railway charges, salmon imported from Alaska, and, I think, some from British Columbia, and coming forward in a frozen state, should be classified.

Now before the learned County Court Judge, the actual method of packing was described. It was described by Mr. Warner, and he said that the salmon in question comes from Alaska and British Columbia. He says: "The fish is perfectly hard frozen when it reaches us. It is packed in wooden cases, wrapped in a number of wrappers, each fish or piece of fish being separately wrapped in two sheets of grease-proof paper, and also in brown paper." Then "The Loggie salmon, a thick paper bag encloses the fish and each piece of fish separately. The case itself is lined inside with bituminous card. There are holes at each end of the case for corks, when the case is not in a cold storage chamber. The corks are in the holes when the cases reach us. Corks are 2½ to 3 inches in diameter. It must be some weeks old before it reaches Liverpool"—that is the fish—and then "We buy the fish from importers who consigned the fish to us."

Now that is the state and condition in which the fish is sent forward, and it is sold here on arrival. The first question raised by the appellants, the railway company, was this. They contended that this was fresh fish, coming under Class 4, where certain classes of fresh fish, which includes salmon, are classified. The contention on behalf of the appellants was that this is fresh fish—salmon—within Class 4. In my opinion the fish so preserved cannot be called fresh fish. It is fish which by reason of the freezing or refrigerating process to which it is subjected has been preserved from decay, but it cannot be called fresh fish. Then the next question is whether it comes within Class 2, which is: Preserves, fish, fruit, meat, and provisions, in casks, boxes, or cases. It was said that this, coming inside a strong wooden case, comes within Class 2 as "Preserves, Fish in cases." Now it will be noticed that the classification of goods includes in Class 1 "fish" preserved by, I think, almost every other method than refrigeration or freezing, for instance, fish that is dried, that is cured in brine, and, as regards red herrings, thoroughly cured. All such fish preserved in that manner comes within Class 1, so that the classification "Preserves, fish," etc., is obviously not intended to include fish preserved in any of those methods.

Now can it be said that under a heading of "Preserves" although extending to fish, fruit, and provisions, a whole salmon so frozen is properly included? In my opinion this heading in Class 2 of "Preserves in casks, boxes, or cases" does not extend to and include a preserved fish, that is to say a fish preserved by the freezing process. "Preserves" is not a term properly applicable to such a fish. The best conclusion that I can arrive at, although the matter is not free from doubt, is that this is a fish preserved in a manner not provided for in the detailed classification; and therefore the effect of it is that it is covered by Clause 20 of the Schedule, and is to be included in Class 3 until it is duly added to the detailed classification.

For those reasons I am of opinion that it is not in Class 4 as "Fresh fish," and it is not in Class 2 as "Preserves," but it is fish preserved in a manner not mentioned in the classification; and was unclassified, and should properly be dealt with according to the rates in Class 3. In that way the order below should be altered to that extent, and, as the parties have agreed about the costs, there will be no costs of the appeal.

Lord Justice Barnes said: There are two points which have to be decided, first of all whether this is fresh fish within the meaning of the language of Class 4, which speaks of fresh fish, including amongst fresh fish salmon. Well, there are a great many senses in which you may use the word "fresh" as applied to fish. You may use it as opposed to stinking fish, but that is quite obviously not the meaning in which it is applied here.

A salmon which has been brought thousands of miles away from Alaska, and has been frozen stiff and packed in a particular way so as to maintain it in a frozen condition until it arrives, and then has to be de-frozen before it is exposed for sale, or at any rate, before it is used, to a salmon in that state, in my opinion, the word "fresh" is not properly applied. Then the question is, not being fresh fish, is it "preserves," and the question, it seems to me, is whether the word "preserves," as used throughout this classification, when speaking in reference to fish, is a reference to a preserved fish or only a reference to preserves of fish. Again there is some difficulty about this, and the conclusion I have come to is that they are speaking of preserves of these different articles. That means to say something that has gone through some treatment or process, which has, to some extent, changed its original character. In my opinion, this appeal ought to be allowed on the point that this particular article is not classified at all and therefore comes under Section 20.

Mr. Justice Bray: The first contention of the railway company here is that this is fresh salmon. Well, I feel quite clear that it is not fresh salmon. We have got the advantage of the evidence of a fishmonger who says that frozen fish would always be sold as frozen fish.

As to the other point, I have a great deal of difficulty, and I do not feel sufficient doubt to differ from my brothers on that point. I agree on the whole that this appeal should be allowed to the extent that has been mentioned.

Fish As Food

Great Britain's Fishing Industry In War Time And After.

(From the London Times Supplement, January 1917).

If war has greatly diminished the present supply of fish, it has also, potentially, greatly increased the afterwar supplies.

Naval exigencies have closed more fishing grounds than by-laws ever tried to do, and, in view of the old controversy over restrictive measures for preventing depletion, it will be interesting to see, after the war, how far some of the most heavily fished grounds will have recovered, and how long the recovery will last. The scarcity of fish has widened the range of fish which is marketable to something approaching the French standard, though unfortunately it cannot be said that domestic fish cookery has correspondingly improved. There is still too much frying-pan. And lastly, the importance of the fisheries, as a national asset, their unique economic position, and their possibilities of great and relatively cheap development, have been demonstrated to a degree only anticipated beforehand by a few enthusiasts.

Mr. Acland surprised most people when he said in the British House of Commons on May 22 last that normally the weight of fish landed and consumed in this country is fully one-third of the weight of meat, whether grown here or imported. Perhaps he rather mystified them when he stated the yet more important economic truth:—

"Fish is a home product which costs nothing to cultivate, an import for which no money goes out of the country, while the capital outlay in proportion to the yield is similar in the case of the fisheries than in the case of any other food-producing industry. From a national point of view, therefore, fish is the cheapest food we can have".

He might have added, too, that fish is the only imported food which does not take up mercantile tonnage, since it is landed by the fishing vessels themselves.

Why Fish Is Dear.

But fish on December 1, as compared with July, 1914, has gone up in price 147 per cent. in the large towns. "How is it", the consumer very naturally asks, "that the cheapest food to the nation is one of the dearest to me?"

Before inquiring where the money goes—and flinging blame about—it is well to consider the exceptionally heavy double pull to which the fishing industry has been subjected throughout the war—the pull of the Navy on the one hand, and of food demand on the other. An official statement of the Board of Agriculture and Fisheries runs as follows:—

"The importance of the British fishing industry has been demonstrated by the war. It is, in effect, a subsidiary arm of the Navy from which both ships and men are drawn for naval services, largely of special and, as events have proved, of most important and invaluable character

"The Navy has already claimed for naval duties more than 75 per cent. of the first-class fishing vessels, and more than 50 per cent. of the total number of fishermen "of all ages, including boys," engaged in the fishing industry.

"As a result of the demands of the Navy, combined with necessary restrictions of fishing operations, the quantity of fish landed by British fishing vessels is now about 30 per cent. of the normal."

In other words, while the supply has gone down to rather less than a third, the price has gone up to rather less than three times, its pre-war level—a not undue rise if we are to endorse the commercial maxim that the price of a thing is what it will fetch; if we are content to leave fish to the unfettered inter-action of supply and demand.

That the fisheries, with half their men gone and three-quarters of the first-class boats (and those the biggest and best steamers)—to say nothing of vessels sunk and captured, and enemy submarines round about—that they should, under those conditions, have kept the supply up to one third of the normal speaks eloquently, not only of the energy and hardihood of the men who remain fishing but also of the magnitude of their "civil" contribution to the war.

Government Aid.

Needless to say, the earnings of steam fishing vessels, too old for Admiralty service, have been very great and the prices obtained by fishermen in general have been high beyond record. Where fishing has not been too much restricted, the inshore fisheries, which were in a state of decay, have so improved their position that in some parts they are in a fair way to find themselves re-capitalized. For inshore fishermen, remembering their lean years, have certainly not squandered their increased earnings; and it so happens that high prices have more or less tallied with the introduction of the marine motor, which, with the same or a smaller crew, at least doubles the productivity of a sailing boat. In the south-west, the Government has aided the installation of motors, by means of a loan, with such striking results, both as to repayments in advance of due and as to increased landings of fish, that it becomes a question whether the nation would not be immensely the gainer from a universal State-aided conversion of every possible sailing boat to motor power.

There is, however, this to be noted as regards the prices obtained by the fishermen: they are not the result of any bargaining power possessed by him. He brings ashore an extremely perishable commodity which he must needs sell quickly—and off to sea again. Now, as heretofore, the price he gets is the price prevailing when and where he lands his fish; and that price is the result of competition among the fish merchants themselves to obtain the supplies they want. What further is added to the consumer depends on what he can get to pay. If the fishermen forwent the market price for his catch, the money would merely go into the pocket of one or other middleman.

Dogfish.

It seems a far cry, though it is only a few years ago, since fish not "prime" was called, and treated as "offal". A week or two past I saw on the 'menu' of a London restaurant "Matelotte de ———" something or other—name unreadable. The proprietor told me it was "rock salmon". And when, after eat-

ing an exceedingly well-cooked and palatable stew of dogfish, I asked him how many of his customers knew what it was, he replied:—"Hush! Nobody! Nobody! They like it." So they should; it was very good. But those wise men who initiated the advertising campaign to popularize dogfish under the name of "hake"—and so, in the West Country, transformed a fisherman's pest into the fisherman's stand-by—probably never foresaw the day when dogfish would fetch up to 8s. a stone, as it did the week before Christmas. Even scad, variously called horse-mackerel or cow's pigs, have fetched their 5s. 6d. a hundred. Every possible fish has been pressed into service. And that is a permanent gain; for each new fish that people learn to cook and eat, instead of throwing it away, is, in effect, an addition to the fish resources of the country.

A Serious Warning.

The above-quoted statement of the Board of Agriculture and Fisheries goes on to utter a very serious warning:—

"The trade at home and abroad upon which fishermen depend is so curtailed as to be on the verge of a total collapse . . . Before the outbreak of war the British fishing industry occupied a position of unchallenged supremacy. Now that the bulk of the fishermen and of the fishing vessels are employed for other purposes, neutral European nations, tempted by the huge prices at present obtainable for fish, are so developing their fishing activities as to threaten most serious rivalry."

Even more than the fishing, it is the distributive channels which have broken down, and which cannot be recreated simply by saying the word, simply by demobilizing boats and men. The fried fish shops, that wonderful, if odorous, modern development, may well be described as the backbone of the modern fish trade, since by absorbing the "rough" they make the "prime" worth catching. They form the main channel by which fish reaches the industrial population. That they have struggled well for existence is evidenced by the fact that the price of rough fish has risen considerably more than that of prime. Squeezed out, however, by dear supplies on the one hand, and military service on the other, they have in many working-class quarters become a thing of the past. Value for value, the price of fish still compares favourably with that of meat. But is it not too much to say that if the fish supply could suddenly be raised to normal it would prove impossible at first to distribute it to the consumer.

Whether the Food Controller will tackle fish remains to be seen. Fish is not a food which can wait while licenses are procured or "adjustments" made. The trade is more complex than outsiders realize. An attempt to control prices at one end only might easily lead to fish becoming scarcer still. Government railway transport of the fish, or at least a flat rate from anywhere to anywhere, should be possible under the present system of railway control, and in the writer's opinion that would be a "sine qua non" of fish control. For only by that means could the multitudinous railway charges be equalized, and clear-cut prices be established for the fisherman at one end and the consumer at the other.

Better Transport Facilities Urgently Necessary.

The after-war problems of the industry—gradual demobilization, renewal of the foreign fish trade, and the

like—are, no doubt, receiving attention. In the main, the recommendations of the Departmental Committee on Inshore Fisheries have shown themselves adaptable to war conditions and still hold good, whether for the improvement of the deep-sea or of the inshore fisheries. It is beginning to be realized how responsive the fisheries are to well-planned schemes of development. Certainly no other industry offers such a return to the nation for a comparatively small State expenditure. Cheaper and better transport facilities; better arrangements for the point-to-point dispatch of fish, instead of so much of it going up to the great markets and down again; development of the cultivable shell and fresh-water fisheries, with their great food potentialities; a general taunting of the whole fish trade organization, which, like most trades that work on big bargains, is decidedly speculative and wasteful—those are some of the directions in which action should be taken. It is possible that direct State help will be needed to set many of the smaller distributors on their legs again. The middleman, who performs a necessary function, is as worthy of his hire as any other labourer, but in the fish trade there are too many who do comparatively nothing and are in a position to levy a high charge for doing it. For the sake both of the fisherman and of the consumer, their expensive services will have to be dispensed with, or switched into more useful channels. Only then will the cheapest food to the nation become also the cheapest to the consumer.

NEWFOUNDLAND FISHERIES.

The "Scotch packing" System.

The Imperial Trade Correspondent at St. John's, writing under date April 18, states that the trade of Newfoundland in the year 1916 gave very satisfactory results, the great increase in the price of imported articles having been fully met by the increased values of exports. Transport difficulties and the United Kingdom restrictions on exports of many articles used in the fishing and shipbuilding industries are greatly restricting trade with the United Kingdom, and increasing that with the United States.

The 1916 catch of fish was fully up to the average yearly catch, and was sold to advantage, the chief fish markets of the world taking liberal supplies during the year. The extra demands for fish foods and fish oils created by war conditions has increased values for these products to an unprecedented extent. The exports of herrings nearly doubled during 1916 a great demand for this fish having sprung up in the United States owing to the decreased North Sea catch, and also to the adoption of the "Scotch packing" system in Newfoundland. Efforts are being made permanently to secure this trade; this is not considered to be a difficult undertaking, as the herrings caught on the coast are equal in size and flavour to those obtained in the North Sea.

The trade in fish oils also largely increased during the year. The compulsory Government inspection of cod-liver oil has led to a much better quality being exported; many authorities state that the oil which passes the test is equal to the best Norwegian oil.

The year proved highly successful for seal fishing. The catch constituted a record one for the small number of ships engaged, 11 steamers bringing in 241,302 seals, valued at 642,463 dollars.

The American Continent as a Consumer of Lobsters

By R. H. WILLIAMS.

The following article on a timely subject was prepared at our special request by Mr. R. H. Williams, Manager of the well-known Lobster Exporting Firm of Roberts, Simpson & Company, Halifax.—The Editor.



THE restrictions against importations of Lobsters to Britain and France at this time and the difficulties of shipping them to other European countries when considered with the submarine menace causes many to divert their attention to the possibility of a Lobster business entirely confined to the American Continent.

According to statistics the pack of Canned Lobsters is about 160,000 cases or 8 million pounds of meat obtained from say 32 million pounds of lobsters in the shell. The quantity shipped in shell is given as slightly over 8½ million pounds. The annual catch therefore may be said to be about 40 million pounds.

The United States has been for many years the principal outlet for shipments of lobsters in their fresh state. Attempts have been made to send live and boiled lobsters to England, Germany and France, but none of these were sufficiently successful to render any extensive business possible.

The various States of our neighboring republic have regulations governing the size that may be sent or used there, and in all but one small section of Canada it is claimed that lobster fishing would not be profitable unless accompanied with the canning industry.

It must be admitted too, that the quantity sent in a fresh state to American markets because of the size limits imposed on their side and the short season on this side, cannot be materially increased under present conditions. If large quantities were sent then lower prices would prevail so as to render the returns to fishermen unprofitable. Even as it is now it is only during a part of the season the prices obtained are profitable to the fishermen or dealers that handle them.

Since the inception of this branch of the business Boston has always been the centre, and while present regulations and conditions exist, it is likely to remain so and be the controlling factor as to prices. American houses do this business through a medium of dealers and commission firms and these reap profits which many contend should be made by our own people if more unity between the fishermen and dealers in the Maritime Provinces prevailed.

Maine, Massachusetts, Rhode Island and Connecticut enjoy a business in fresh lobsters and although all combined have not an equal supply to that obtainable from Nova Scotia itself, they, not us, are the masters of the situation. There are, of course, some features wherein these States have an advantage over Canadian dealers inasmuch as they are from 12 to 24 hours nearer to the principal consuming centres. Maine stocks its ponds and cars with Nova Scotian lobsters when prices rule low and retails them to the consumer when high, selling in the meantime such lobsters as develop their spawn during the warm weather at a good profit to the State authorities so as to replenish Maine waters with lobsters for future seasons. Boston collects a

commission of five per cent on nearly all the Canadian lobsters that go there, and a profit besides. Dealers in Canadian cities prefer to buy from the States than from Halifax because the latter cannot furnish their requirements for the whole year. Thus they pay higher prices and an import duty as well.

The fishermen and dealers in these Provinces quarrel among themselves and refuse to be reconciled to each other so that the American dealer steps in and takes their profits. They remind one of that picture showing two men disputing about a cow, the one tugging at its tail and the other pulling at the head while a lawyer between the two is taking all the milk. The American fishermen and dealers are perhaps quite as guilty of quarrelling with their neighbors and competitors, but as a rule they appear to get together before their profits fall in the hand of outside parties.



WHILE divided into so many fragments, the business in fresh lobsters for Canada can only be improved with much difficulty and will never be as remunerative to the country as it should be. If more closely linked together our fishermen and dealers could have ponds and cars like those of Maine where the stocks could be stored and disposed of throughout the year. They could furnish buyers with supplies at any and all required dates. They could arrange for transportation facilities and proper accommodations by railways and steamers for carrying lobsters to their destinations, and compete successfully with those points that may be nearer the large cities of the States and Canada than ourselves. They could develop the trade in our own country and extend it further West than is possible at present and make it a larger and more profitable business for themselves and Canada.

Even if they did not wish to disturb the present Boston connections they could by joining hands in a common cause save thousands of dollars annually by getting their lobsters to that market in better condition and seeing that they get a "square deal" when they land them there.

This feature needs attention irrespective of whether the canned lobster branch is confined to this Continent or not. Moreover this is not advocated as antagonistic to our American ally, but in the spirit of self-preservation and "Canada First".

According to the Government export statistics for 1914 the quantity of canned lobsters sent to the United States was about 47 thousand cases, and to the West Indies, Central and South America about 350 cases. Deducting the total exports of these goods from Canada during the year from the total pack the quantity as being used in Canada is about 4,200 cases.

These figures do not agree with those furnished from well-informed trade circles. It is pointed out that quite a large portion sent to the States is usually re-shipped from there to European and other countries, and that many lobsters find their way to the central and southern portions of our Continent from English ports. The generally accepted proportions of

an annual pack consumed on this Continent are given as follows:

- 32½ M. cases in the United States.
- 12½ M. cases in the Canada.
- 5 M. cases in the other parts of America.

The American trade in canned lobsters is well catered for by the American packers in our midst and by various others who specialize for that market. The trade in the Eastern States is small when considered "per capita" of their population because lobsters in the shell are frequently preferred. The Middle and Western States provide a good market and with the increasing population, should the present prosperity of that country continue, the business there is capable of a steady development.

The same may be said of Canada. In the east supplies of fresh lobsters are obtainable and because our own country has in the past been made a dumping ground for inferior grades there is perhaps more prejudice against lobsters in tins evinced here than in any other country. It is said that many Canadian consumers having become accustomed to poor qualities actually consider canned lobsters like live lobsters more black and green than red and white. The increasing English, Scotch, Irish and Welsh population in the Western provinces makes a good market for good qualities such as these immigrants had been accustomed to buy from the grocers in the Old Country.

The other American markets have been only partly explored. Canadians have not entered the Spanish American business, lacking knowledge of the language and currencies and modes of payments in these countries, being handicapped as well by the smallness of individual orders and the absence of direct communication.



THROUGH ignorance Nova Scotia has neglected to cater properly to trade in the West Indies. All inferior food-stuffs used to be considered suitable for the colored people of those islands and so goods that were unmerchantable in other markets were sent there. Canadians know more about the West Indies now and realize that good foods are wanted there as in all other countries. The extent of these markets is of course limited at present high prices, enhanced by existing rates of import duties. The orders for canned lobsters being small, are usually given in connection with other groceries, so that direct trade between packers and dealers there can be expected only from places in touch by steamer with the ports of these provinces.

To hope that we can make this continent, with its estimated population of 175 millions, consume eight million pounds of lobsters in a year, does not seem a very difficult proposition since it will average less than 1oz. per person for 365 days. It means but little over a pound of lobster per capita per annum for each Canadian—or a tenth of a pound for each resident in the United States. This amount surely could be eaten without increasing the distresses of indigestion. This system of reckoning while interesting, may be somewhat misleading. Rather should we ask whether the people on this continent can be induced to eat three times as much lobster as they have been in the habit of doing.

For the immediate future it is believed easily possible when all food-stuffs are in such demand and prices of all other canned products so greatly advanced.

Proper organization, however, is necessary to produce the best results, and as to "After the War Con-

ditions" unity in the trade is even more essential, and the best means of "Preparedness" should be considered now.

One of our leading Canadian statesmen has recently suggested that possibly those interested in the lobster industry should GET TOGETHER.

In unity there is strength and if the trade will permit itself to be brought closer together and adopt the maxim of "Live and let live" more than in the past, many things that now appear impossible may be accomplished. After all, this lobster business may be only one of those supposed insoluble human problems which the British premier tells us can be surmounted.

SPRING SALMON FISHING POOR

Catches Are Small and Few Fishermen Operating — Prospects for Sockeye Run.

The spring salmon fishing on the Fraser river is still very poor. An indication of the situation is found in the fact that the Fisheries Office has so far issued only about 560 licences this year, or about half the number out at the corresponding year. Thus there are very few fishermen operating, and yet the catches they get are miserably small. Recently one cannery reported that nine fish were secured by three boats as the result of a night's fishing. One of the boats was "skunked", one had four and the other had five. It is possible that the spring salmon run is merely late, and may come on later.

An officer of the fisheries branch, sent out to get eggs of a certain species of trout, reported that these fish, usually on the spawning grounds early in May, did not show up til about the end of the month. A similar condition may exist with the salmon.

There is considerable discussion on the river regarding the possibility of a big run of sockeye or otherwise. This is the fourth year, but the B. C. Packers' Association has announced its intention not to operate all its canneries, as it usually would in a big year. The reason given is that four years ago a slide caused by construction work on the C. N. R. hurled tons of rocks and earth into the Fraser at Hell's Gate, causing a block which, it is claimed, prevented many salmon from going up the river to the spawning ground. In this connection, Mr. F. H. Cunningham, chief inspector of fisheries, says that no forecast as to the probable effect of that obstruction on the sockeye run is possible. Whether it had no serious effect can only be determined after the run. The early run in 1913 got past before the slide came down, and prompt measures were taken by the department to facilitate the passage of the second run by the construction of flumes. In addition some millions of eggs were gathered and hatched out at the Harrison Lake hatchery. It is hoped that these measures will prove to have been effective, and that the sockeye run will not have been seriously decreased.

It is also pointed out that the number of fish below the obstruction was much larger than it would have been under normal conditions for the reason that there was a strike of fishermen on at the time, and thus thousands of fish that would ordinarily have been caught in the nets and never got to the spawning grounds were thus allowed to go up.

BAHAMIAN FISH

Some Notes About Fish and Fishermen in the
Bahamas—Trade Opportunities for Canada.

Written by Victoria Hayward. Photographs by
Edith S. Watson.



 WALKING down Bay Street in Nassau a few days ago, we turned in to the office of the Dominion Government Agent, and there we were surprised and pleased to find a copy of "The Canadian Fisherman." (We promptly borrowed the copy from the gentleman-in-charge, and took it home with us to read). On seeing "The Fisherman" we felt at once as if we had met an old friend who came not alone, but brought along other old friends—the far outports of Newfoundland and Labrador, the Magdalens, the French shore in Cape Breton, down north and up along toward Cape North, Canso and the Eastern shore of Nova Scotia, the Southwestern to Yarmouth, and the Bay of Fundy to Digby, in most of which from time to time we have seen the fishermen, splendid fellows all, reaping the harvest of our northern seas—the silvery herring and mackerel, the dory-loads and "bankers" of cod, lobsters fit for kings, and in the Magdalens women digging in the sand for the dainty clam with which the men bait their hooks.

It then occurred to us that perhaps our Northern fishermen may enjoy hearing something about the fish of these tropic waters—the fish that compete against codfish, in the markets of the different West India Islands.



THERE is a great variety of these southern fish, but with the exception of "Jew Fish," "Rockfish," and "Grouners," none of them are large. Though Jewfish and rockfish are often caught, that turn the scales at a hundred pounds. But all the others are fish weighing under twelve pounds, and most of them on the market are "pan" fish, weighing from six or eight ounces to two or three pounds.

The water in which these fish are caught is clear to a great depth, so all going on at the bottom is visible to the fisherman in his boat above, and when the water is deep or rough, the fisherman uses a water-glass, merely a pane of window-glass set in the bottom of a box or bucket, and puttied around so as not to leak. This water-glass he holds firmly against the top of the waves, and looking through it sees all the actions of the fish as plainly as though he were at a theatre looking at the actors on the stage.

Just think what a heap of hauling-in of line, our northern fishermen would be saved, what wear and tear of clothes and tackle, if they could look through a pane of glass and see if a cod had taken the hook or not!



FISH, living in such sunlit water as this, south of the Gulf Stream, so that the water is always warm and full of light, take on the most beautiful colors—colors such as the rainbow paints in its arc of the sky, such as our Northern Lights flash from out the Arctic, such as the richest opals and amethysts emit when sunlight falls upon

them. It does not matter whether one is a fisherman or not, there is unbounded pleasure in looking at the color in these fish, and their grace. Artists love to paint them. There is one artist here now, in Nassau, specializing on fish, trying to paint them swimming about naturally in the water. This artist is an Englishman, and already his work in painting these fish, depicting their jewel-like colors and their grace of motion, has won him a place in the world of art. If he were to go north and try our codfish and our picturesque codfishers in sou'westers and oil-skins, I am sure he would find them equally excellent subjects, and it would be good advertisement for our fish to have our northern "Captains Courageous" appear in our art galleries, and I am equally sure that "the bigness" of the theme would be welcome to all true lovers of art, in Canada. Here are some of the names of these fish. One they call an "Angel." His colors are blue—Royal blue and a golden yellow! The dorsal and ventral fins end in long graceful whips—as wide as it is long. The body of the angel fish is saved from clumsiness by these whips; while the blue-and-gold head ends in a mouth about the size of a thumb nail. Looking through a water-glass at one of these angel fish is like looking at a fairy creature. It seems too beautiful to eat, but even so, it is considered the most dainty to the palate of all this southern fish.



ANOTHER fish has a hard three-sided shell. This specimen is cooked much as lobster, though it is frequently opened on the bottom, stuffed and broiled in the shell. In Nassau there are several varieties of these shell-fish, but "cowfish" and "cuckold" are the commonest.

School-master's, Margaret fish, sailor's choice, grunts, hinds, snappers, sargeant-majors or cow-pilots, Jacks, cavelli, bonitas, hog-fish, turbot, shad, goggles, hamlets, nigger-fish and Spainards are always in the market.

The flesh of all these fish is firm and fresh-looking, most of the fish being brought to market alive in "wells" that allow the water to flow in and out, so that in its constant change the fish is always "drinking" afresh. Many fishermen put any extra fish they may happen to catch in "crawls" or "kraals," or enclosures, built of stone, out from the shore, forming a sort of "room," through which a fresh supply of seawater is always flowing.

Excellent as this southern fish is in flavor and great as the variety, none of it keeps for any length of time when salted, which, of course, prevents its exportation. And also, although there are so many varieties, no one of them is caught in the great quantities that cod is captured in northern waters.

Of course, attempts are made to salt some of this fish, and strings of it may be seen hoisted up the masts, hung on poles and spread on the decks of fishing-craft in the harbor of Nassau at any time at this season of

the year. But all this "salted" fish is for home consumption, and is sold here in the general market of Nassau, and in little retail shops presided over by colored people, in the suburbs over the hills, where the negroes live, in tiny cabins, half-hidden by groves of coconuts, sapadilloes, oranges, bananas and grape-fruit.



THE Southern fishermen, like most of our Northern men, build their own boats, but the model is altogether different. A dory would not do for southern waters. For one thing a boat carrying a "well" must of necessity draw considerable water, and the more she "settles" the more sail can be carried. Great attention can here be paid to a boat's sailing qualities, because the equipment, anchors, etc., for this clear and shallower water is lighter than in the North. I remember reading in Judge Prowse's History of Newfoundland, that in the early days some boats came up from Bermuda to fish on the "Banks, and that these same vessels could 'beat' out of St. John's harbor when the Newfoundland craft



Bahamian Fishing Boats, Nassau.

Photo Edith S. Watson.

could not, and for this reason the Bermudians could make more voyages to the Banks and bring in more fish than the native fishermen." After a time, instead of the islanders improving the models of their craft, they legislated against the competition of the "foreigners." This incident shows how much attention even in those early days was paid to "speed with strength," by the fishermen of the sub-tropics. The slow boat in these waters would perhaps find her catch rotten before getting to market, or she would find herself out-sold by a speedier boat. As competition is the life of trade, so it is the man quick to see and take advantage of the least opening, the first opportunity, who stands the best chance for success in the fish-trade. No stone should be left unturned by shippers of codfish to the West Indies to have a good sound fish well-salted, but not burnt with salt, put before these people. Do not commit the fallacy of thinking because two-thirds of these island people happen to be black that they don't know good food. Man for man being cooks, they are even better "judges" of fine foods than the white, and even these negroes are accustomed to surroundings—palms and

fruits and vegetables altogether prohibited our Northern fishermen. If the black man is fastidious as to what he eats, and how it is cooked, think what the taste of the white people of these islands is!

If some of these simple truths were borne in mind, some of the codfish I have seen in our northern ports destined for the West Indies would never have been shipped.

The people here are great fish-eaters. They eat fish every day of their lives, and many families serve it twice a day. Fish is the natural food of the Tropics: that and fruit. The press does not here have to urge upon the people "two fish days a week."

Every Day is a Fish Day.



NOW think a moment what that means. It would have to be pretty nice, attractive fish that Canadians would eat every day of the week, every week and every year. This native fish of the West Indies is attractive, as I have shown it is a thing of beauty pleasing to look upon as jewels please the eye.

If the codfish arriving here were even half-way tempting to the eye on the simple merit of soundness without being "salt as the ocean seas" to the taste, I am sure that more of it would be eaten here.

Surely there ought to be a good market for Canadian fish among a people eating fish every day of their lives!

In some of these islands not as much codfish is consumed as formerly. If at the present time the good fish is bringing too high a price at home to send here, then I am afraid when the time comes to try for these markets again there may be no market open, or other competitors may have tacked under the Canadians' lea and got to windward.

Transportation, quick and sure, will be one of the features that anyone planning to embark on this trade must very seriously consider before undertaking it. At present visitors to Nassau may almost tell the time of day by the whistle of the passenger and freight boats from New York and grocery men know almost to the minute when a barrel of flour or a tub of butter or drum of fish from "The States" will be in their hands ready for the retail trade.

There is no reason why Canada cannot compete, not with "The States" in particular, but with all nations, in the possession of steamers and sailing vessels of all types that can do the work required of them: and Canadians must not think it a virtue to put up with less than the best. They must insist upon it, if "Canada" is to be the powerful talisman in trade and in the fish trade in particular, that it ought to be.



TO come back to a small matter, I have often been surprised at the sort of boat-bailer that the average fisherman of our Canadian coast uses to get the water out of his boat.

It is to his credit that he has made it himself, but its form is ill-fitted to its purpose since it takes up so little water. It is unnecessary to describe it because every reader is familiar with the scoop that looks like a box with one end knocked out, having a handle attached to the end left in.

Fishermen in the Tropics girdling the entire world, use the half of a gourd for a bailer, and I think if our fishermen once used one of these gourds, or a "cocker," or "calabash," which are nearly the same things except that one grows on a vine and one on a tree they would never use anything else. These gourds cost a

cent or two only. Any importer along the coast could handle them. I believe, too, our fishermen would take a great deal of comfort in a sponge for the boat. There's never a fishboat going to "the grounds" as tropic "Banks" are called, but has its sponge for which in a boat there are a thousand uses. After bailing out the boat the fisherman sponges out any remaining water. The best fishermen in these warm climates may easily be known by the spotless condition in which he keeps his boat. Some of the expert fishermen find it pays to paint boats inside and out twice a year. Being drier they are lighter in the water and in consequence sail faster and row lighter.

The Bahamas is the home of sisal, but the most of the fibre is shipped raw to the United States. Some of it comes back as rope, but the fishermen find a very satisfactory rope in that which the islanders make from the twisted fibre of the Palmetto Palm-leaf. The rope is stiffer than hemp or sisal, but if care is taken to dry it after using it, lasts a satisfactory length of time, and, of course, is much cheaper than the rope ordinarily in use everywhere.

What does the fisherman of these regions use for bait?



THE flesh of the conch. One "conch" makes quite a number of "baits."

There is one advantage about this kind of bait—it is always in season. Every day of the year conchs are to be had for the simple exertion of nipping them up from bottom with a two-pronged rake. In these "conchs" the fisherman occasionally has the good-luck to find a pink pearl of considerable value. But these "finds" are rare.

The fisherman makes a little additional money by selling conch-shells to a dealer. Before the war a good business was done in these conch shells, both here and abroad. All who have seen one of these conchs will recall their beautiful pink lining looking like fine porcelain, but few will realize that it is the material from which cameos are cut.

The dealers have the lip of the shell sawed off by a machine. These lips are then packed in barrels and shipped to Rotterdam where the cameo-cutting is mostly done.

What remains of the shell is used for road-making and for filling in wharves to which the fish-boats "make fast" while marketing the catch.

The conch meat is excellent eating and tastes not unlike lobster when made into an attractive salad.

So it may be judged that in these molluscs nature has provided the fisherman with a very excellent bait and one which these fish almost over-fastidious as to what they eat, since they have in these sun-lit waters thousands of marine tid-bits from which to choose, readily accept.

One more use is made of the conch. Greek sculptors always placed in the hand of Neptune, the great sea-god, one of these conch-shells for a horn.

The god himself a myth, few of us realize that the horn-blowing is a touch of realism.

But, if you could hear "the conching," the blatant penetrating "honking" from the conch of the incoming Bahamain fishermen as they sail up the harbor of Nassau "to market" you would appreciate that even the fish-trade has its element of romance.

It is a sound that once heard will always be remembered. When it first begins away off in the distance, when only the white sails may be seen out of the blue-sea against some distant low-lying

point of land with its palm trees silhouetted against the Tropic sky, and then gradually grows louder and louder as the boat comes nearer in her sailing it is one of the most pleasing and suggestive ways of announcing "a ware for sale" that trade has ever invented.

If local fish-merchants were to use one of these conchs at his shop door on Tuesday and Friday mornings he'd soon have a crowd assembled, and his fish would sell like hot-cakes.

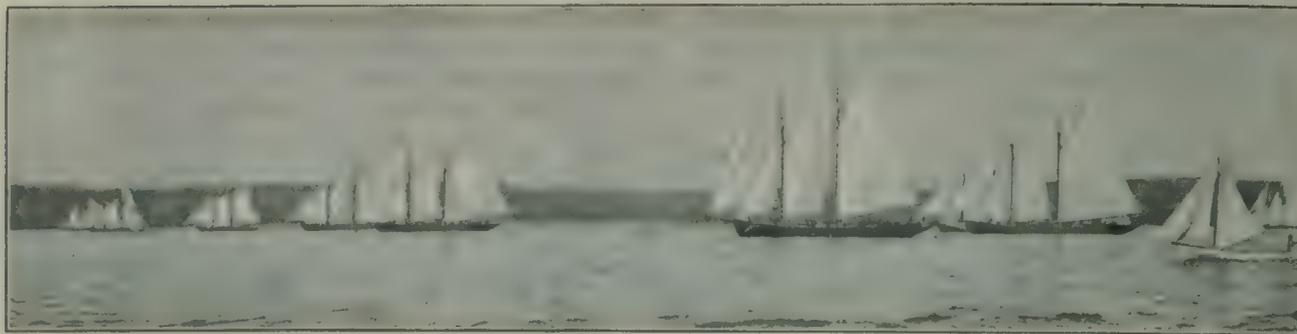
FISH CATCH TO BE LARGE, SAYS LOCAL EXPERT.

"The fish catch will not be affected by the cold and late spring of this year", declares J. A. Paulhus, manager of the D. Hatton Company. "On the contrary, the catch will reach its normal point, and may even be greater than in other years owing to the prevailing easterly winds. The lobster season has just closed very satisfactorily. Owing to lesser exportation to the old world and a drop in the bulk canned, the lobster has been selling at a low price, heretofore unknown. Mackerel is reported as being very abundant, but this fishing will not be on before ten days." Mr. Paulhus also touched on the question of duties on fish, which the Canadian consumer has to pay on fish brought in from the United States. Things, he said, are illogically conducted. The American can come over to Canada, acquire a plentiful supply of fish and then transport it home free of duty; whereas the Canadian is constrained to go over to the American market, purchase the fish taken from the Canadian market and ship it home only when duty upon it has been paid. The Canadian consumer, for instance, has to pay a duty of ten cents on every gallon of oysters imported from the States. Again, when the shad is in Florida waters, Canadians have to pay one cent per pound duty for its importation, whereas the American, at the period of the shad's migration to Canadian waters, can import the fish free of charge.

VALUE OF ONTARIO'S FISHERIES.

The commercial fishing in Lake Erie began a little later this year than last, and from the reports received up to date the catch would appear to be an average one. The statistics for this year are not yet available. Last year, however, there were caught from March 15th to May 31st, in the waters of Lake Erie fronting the province of Ontario, 401,234 pounds of whitefish, 5,699 pounds of trout, 141,282 pounds of pickerel, 11,596 pounds of sturgeon, 928 pounds of caviare, 391,551 pounds of herring, 109,633 pounds of perch, 1,305,636 pounds of blue pickerel, 24,708 pounds of pike, 4,959 pounds of catfish, 4,823 pounds of carp and 342,209 pounds of coarse fish valued at \$232,691.97. Fishing in the other lakes of the province is not carried on to any extent until the month of May.

A great portion of the fish caught are sold in the United States market, and frequent protests against this are lodged with the Ontario government. The fishermen, however, must be allowed, say the provincial Government, the privilege of disposing of their fish in the market which will bring them the best returns, and fish of the coarser kind, which could find no buyer in Ontario, are quickly sold at good prices in the large cities of the United States. All licensed fishermen are required to furnish for home consumption such fish as are required for local consumption at their contract prices.



Fisheries Waste

Its Use and Value

By J. B. FEILDING, F.Z.S.



THE problems associated with industrial wastes during the past twenty or thirty years have been all absorbing subjects in the old world, but owing to the great natural resources and wealth on this Continent these problems have not become as important as they should.

Now the world is at war, food producing is the topic of the hour, be the food of the character that is known as "direct" or "indirect," in other words, be the food adaptable to the human being, the farm animal or the farm and garden crop. When there is "direct" food shortage it is invariably due to conditions associated with "indirect" food shortage. Today we are faced, owing to many millions of men taken from fields of production and put into spheres of destruction, hence all conditions of life are abnormal. Raw material diverted to other than normal uses; many by-products are being entirely neglected for the essentials of war, hence the producer of food, namely the farmer is "up against" many serious problems connected with the proper running of his industry—namely, food production on the land.

Starting at the basic origin of food the soil, we find shortage of soil stimulents, i.e., fertilizers.

The fertilizing elements, phosphorus, nitrogen and potash, are all affected in these times. Phosphatic fertilizers are affected by the high price of chemicals necessary to the conversion of bone and coprolites into phosphate of lime. Nitrogen is dear owing to the great demand on Chilian nitrate of soda for explosives and potash is scarce owing to the fact that the basis of potassic fertilizers is obtained in Germany in the form of kainite and stassfortitie.

With this scarcity and high cost of chemical fertilizers existing it must naturally cost more to produce our crops.

Another element we must not overlook and this has, as a matter of fact, in the past been always with us, naturally the fact that we in Canada are dependent, to a great extent, on foreign countries for our artificial fertilizers. Hitherto our phosphatics have come from Florida and other states. Nitrates come from Chili and our potash from Germany. Now there is no reason whatever why all these elements could not be obtained in Canada just as cheaply and in some cases cheaper, where methods adopted to conserve and make use of products, waste and otherwise around us in our fishing industry.

Let us now look at the conditions surrounding the other form of "indirect" food, namely that necessary to our farm live stock. The fundamental elements necessary for the building up of animal bone and tissue we all know to be protein, fat, carbohydrates and lime. Of these elements protein and fat have become high priced commodities not only on account of war conditions, but even before the war owing to greater and wider consumption. Animal foods as to market price are based on the quantity of protein and fat contained in them and which must be guaranteed by the manufacturer. Again another feature must not be overlooked, that of digestability of the protein and the purity and sweetness of the fat; many foods may show on analysis high protein and fat content, but a large proportion of the former may be indigestible and the latter may have broken down and become acid. We must realize that the farmer looks to a food that is palatable, keeps well in storage without chemical change, is digestible, and contains a high percentage of bone and tissue building material.

Now, what are the market conditions to-day, and what are the sources of protein and fat used on the farm as live-stock food, other than the crops the farmer can grow? Regarding the latter it is doubtful economy at present prices if the farmer feeds his whole grain on the farm, but it is a matter of opinion as to what is the cheapest source of protein and fat in these times. At any rate protein and fat concentrates are essential and absolutely necessary to the farmer in order to balance his cereal feeds containing as they do, chiefly carbohydrates. Further, there are many mill "offals" such as bran, shorts, etc., which are cheap sources of food, but require the addition of a protein concentrate to make them economic.

The concentrates chiefly used at the present time in this country are linseed cake meal and cotton seed cake meal, both termed protein concentrates. Both are wastes from other industries—the oil extraction industry. Both as to price are controlled in foreign countries, both are in the hands of a few people who can, if they wish, manipulate prices and quantity available for the market.

The prices of these two feeds have been going up yearly and to-day, of course, are influenced like everything else by war conditions, but their comparative prices are based on their protein and oil content.

The following prices and analysis have quite recently been quoted of these two feeds:

	Price F.O.B. Toronto,		
	Protein.	Fat.	per ton,
Linseed cake meal.....	40%	6%	\$56
Cotton seed cake meal.....	23%	5%	\$40



THESE apparently are the only protein concentrates used for cattle in Canada, but for hogs another source is looked to, again an industrial waste known as "Tankage." This is a waste from the pork packers slaughter houses and consists mainly of blood. It is a material that even when dried does not keep well, but it is rich in protein though poor in fat. It is rich as a rule in phosphate of lime, an essential in a feed as a builder of bone structure. A late analysis and price sent the writer is as follows:

	Price, F.O.B. Toronto,		
	Protein.	Fat.	per ton.
Tankage	60%	8%	\$65

Another packers' waste is what is known as beef scraps. These consist of the unsaleable portions of the carcass of animals, for example the lungs, digestive tract, and so on. The current price of this commodity as put up by a leading packer is \$90 per ton, price on rail at Toronto. Its feed value is approximately the same as "tankage," perhaps a little better in fat content, but it keeps better and is easier handled.

These packers' wastes vary very little in price from year to year, in other words we find that for a 60% protein concentrate the farmer has to pay a price of around \$60 to \$90 a ton. Now, there is no doubt that the protein and fat in these packers' wastes are easily assimilable by hogs if not spoiled in storage, but are valueless for feeding herbivorous animals such as horses, cattle and sheep.

It is possible the reader will be wondering why I am raising all these points which apparently at first sight have no bearing on the fishing industry, but it is for this very reason that the fisherman as a rule has no knowledge of the possible markets for his "waste," that I am giving him some idea of other commodities used in agriculture which have an analogy.

In the fishing industry we have many "wastes," these are materials of no value on the human food market yet are rich in protein fat and phosphate of lime—all necessary body building elements. Now the question is can these be used to the same advantage as the "waste" from the packer and oil refiner? From many years experience in Germany, and other countries the writer can definitely assert they can, and more than that, some of these fish wastes have been proved to be richer than any protein and fat concentrate known on the market, and more easily digestible than the protein and fats of either linseed or cotton seed. Further, another somewhat startling feature about these fish feeds is that cattle and sheep do well on them and can make more economic gains from them than they can from the usual feeds of both animal and vegetable origin. This cannot be said of "tankage," which is solely a hog food.

The food value of fishery waste has been tested out in Europe over and over again on all classes of livestock with satisfactory results. Why then has it never been tried here? It is true, however, a few feeding tests have been made in the United States, but no great effort has been made to popularize this source of pro-

tein. Possibly one of the reasons of this holding back is due to the fact that the process of manufacture is not generally understood on this continent and a certain quantity of unsuitable fish waste has been put on the market only to produce ill effects on live stock. Once a farmer has been "bitten" and lost a few head of stock by feeding unsuitable foods to his livestock he will never try the material a second time, and further than that he advertises its bad qualities throughout his neighborhood. I have often heard of fish waste as only being suitable as a fertilizer and it is often too true, owing to improper manufacture.

The antipathy for fish waste as a basic food product has in the past been often justified, but that is no reason for its wholesale condemnation. In Germany, Holland, Denmark, Norway, England and other old world countries fish meats are used. Indeed Germany, previous to the war, took from 18,000 to 20,000 tons of England's surplus in addition to her own, for her agricultural industry chiefly as "food stuff."

Fish waste fertilizers are well known on this continent, but then again they have not gained as high a reputation as they should for the same reason — generally too much oil has been left in them, and further they are not a chemically "complete" fertilizer as all organic fertilizers should be until compounded with other essentials.

Now as to the value of these fish waste products. We can base them like all other livestock foods on their chemical content in protein fat and phosphate of lime. As fertilizers we base their value on their nitrogen and phosphoric acid content. It is difficult to give a chemical formula which would be applicable at every fishing port for the waste must vary in its composition. Sometimes it consists of only viscera or guts, sometimes only heads, tails and guts, sometimes it is whole fish of no value on the fish market, sometimes it is a mixture of all, but I think it safe to say that in the vast majority of cases its protein content is higher than that in packers "tankage," generally higher in fat and about the same in phosphate of lime.

This being the case it should be valued at the same, if not better prices, than tankage in view of the fact that it has a wider range of usage. Fish meals properly made are by no means uncommon carrying 62 per cent. to 64 per cent. protein, 15 per cent. to 20 per cent. fat, 10 per cent. to 15 per cent. phosphate of lime.

Is it not time then that some of our large canning industries of fish companies looked into this problem? The editor of The CANADIAN FISHERMAN has recently stated that the raw material from which these foods can be made is ample, namely some 250,000 tons a year, in other words, nearly 50 per cent. of the salmon used on the Pacific Coast in the annual pack, 45 per cent. of our total catch on our inland waters, 75 per cent. in our lobster pack, and from 45 per cent. to 50 per cent in our Atlantic fisheries.



THIS is not all the sad tale, for beside this valuable source of indirect food supply is there not much valuable oil also going to waste and even if made is generally only of—shall we say—2nd grade quality.

Many are the trades asking for high as well as low grade animal oils, oils which are getting more scarce every day on account of the greater demand for them and general shortage.

Few vegetable or mineral oils can replace a high

grade animal oil in many of our industries. With lard standing around 28 cents a pound, and linseed oil now at \$1.50 a gallon in barrel lots, something will have to be introduced to help out the situation. Even in normal times linseed is quoted around \$1 a gallon. Again cotton and oil stands to-day about 17 cents per pound for No. 1 quality.

While fish oils are quoted on a foreign market at prices according to quality ranging from 35c. to \$4 per gal. I suppose the oils principally used in our industries would be petroleum oil of various types, linseed oil and cotton seed oil practically all controlled as to quantity and price outside of Canada and yet here we have oils of high grade and very varied as to the industries they can be used in being thrown overboard, buried or otherwise wasted.

The drug trade demands high grades of fish oil and I am told little if any is made in Canada of the quality needed though we have all the raw material available. The paint trade demands a drying fish oil for outside work, but none I believe is made in Canada though the paint trade is paying \$1.50 a gallon for its linseed oil at this time.

For outside work on ships and on either wood or iron no oils, linseed included, have such resisting qualities as fish oils properly selected and suitably blended with a tungate drier. It is more resistant of heat than linseed oil so it becomes invaluable for boilers and smoke stacks. The prejudice against fish oil as a paint conveyor is often justified when one sees some of the offensive smelling materials sometimes offered. A good fish oil for paint use should be practically free from smell, it should not in any case be offensive.

The leather trade demands large quantities of fish in the currying of leather, yet it has to buy it in foreign markets. The same can be said of many other industries, let us ask ourselves why?

I wonder how many of my readers glance through the weekly or monthly circular of the Department of Commerce and notice the continual applications from foreign buyers of fish oils, and yet we turn a deaf ear and still dump our "waste."

The utilization and conversion of these raw wastes are not new to commercial history for they have been used for twenty or thirty years, but the time has come when we in Canada will have to look more carefully into the leakages in our industries, for though great wars come and go, civilization we hope will spread and with it the demand for such products as we are now throwing away. Don't let us handle our great fishing industry as we have our timber in the past without any consideration of waste for a day of reckoning will come.

Now is the time for our canning companies and fishermen to follow the meat packers and oil refiners and prevent these wastes.

I do not wish it to be understood that the manufacture of a high grade and chemically delicate substance is "as easy as falling off a log," for many mistakes, indeed disastrous failures have been made in the past and it is by these we learn for the future.

The elements of which the fish and its waste consists is very delicate and unless handled as it should be will invariably call for trouble if certain fundamentals are overlooked, but the finished product, be it food for cattle, sheep, pigs, or poultry, is very valuable now and will be more so in the near future. As to the oils it is needless to say anything for every reader of the daily newspaper can see at a glance the

serious state of shortage and high prices of all classes for all requirements.

I have lived in no countries in the world but Japan and Germany where I have been so impressed with the intensive and economic development of the fish industry. The former because she has been compelled to and the latter because she lives by and on the sea.



THERE are many other problems arising out of the fishing wastes and bye products I should like to touch upon, but space precludes for the present, but twenty odd years of travel and experience of the problem have brought many things to my notice which are now becoming all absorbing in our everyday economic press.

The products of our land have been given far more careful study than the products of our water so it would surprise many of us were a list of everyday requirements made whose origin is of the water or is not composed of at least one product of the water.

To the ordinary observer fish for the table is the only product of the water, he does not stop to consider the origin of his pearl shell shirt button, the iodine now so largely used in sterilizing wounds on the field of battle, isinglass, sizes for the cotton and cloth industry glues, dyes and pigments, fertilizers, feeds for live stock, leather, many medicinal and chemical products, oils for painting, lubricating, tempering steel, for making soap, and many other commodities besides fish for human consumption.

They say all things come to those that wait and truly may it be said that the "Old Lion and her Cubs" are slow to originate new industries, but once fully appreciated they generally come up to expectation. With the great central powers now out of industrial competition surely we have a glorious opportunity of getting under way.

EAT MORE FISH.

To eat more fish is one practical measure for food economy according to the New York Mail. "A pound of fish per capita is about all the sea food we have eaten annually", declares The Mail. "To most of us fish is a rare food, to be eaten only on occasion, and yet we would be fed more cheaply and quite as well as, like the people of other countries, we ate fifty pounds of fish a year. Fish eating cuts down beef eating. When the pastures of the sea supplement to a far greater extent than now the grassy plains on which we feed our beef animals, all meats will be more plentiful than now." "If the food scarcity brings to us a better knowledge of the value of fish, we shall be the gainers."

MACKEREL PLENTIFUL.

Halifax, June 5.—The waters of the Nova Scotia coast to the eastward and westward of Halifax are teeming with mackerel are reported from Prospect and other places adjacent to Halifax harbor. In fact thousands of No. 1 beauties were brought up to the city recently from those places for shipment to Boston and New York markets.

Captain Jollimore, in the schooner James L., alone, has landed at the wharf of the North Atlantic Fisheries over 40,000 count mackerel in two days, 23,000 and 19,000 respectively. These were caught by Prospect netters and iced for immediate shipment to markets. —Lunenburg Weekly News, July 7.



The Battle for the Fishes

What the Heedless and Selfish Did to Depopulate the Streams

By the HON. WILLIAM E. MEEHAN.

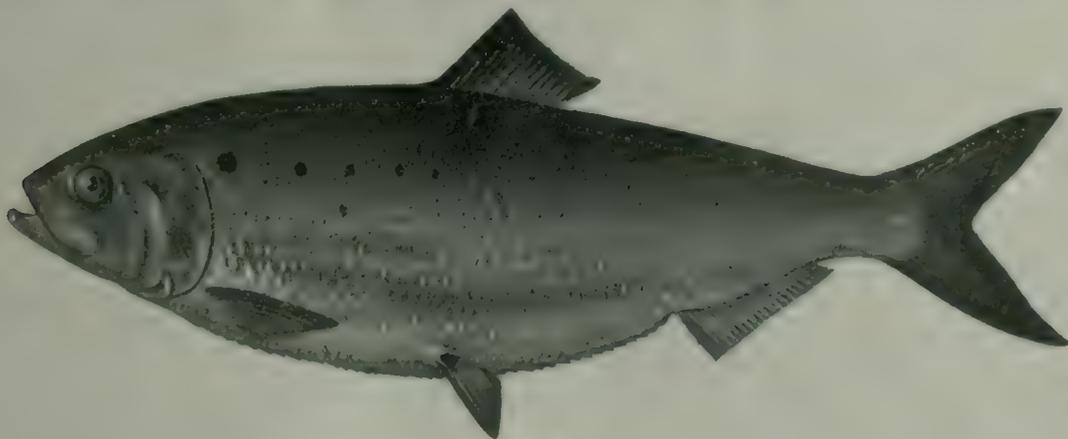
Formerly Commissioner of Fisheries of the Commonwealth of Pennsylvania, Superintendent of the Public Aquarium, Philadelphia, Author of *Fish Culture in Ponds and Other Inland Waters, Etc.*

Americans are credited with being the most extravagant and wasteful people in the world with respect to their natural resources. When a review is made of the history of the United States from Colonial times until a comparatively recent date, it must be regretfully admitted that there was a sound basis of truth in this unpleasant reputation. Much has been done towards repairing the destructiveness that was wrought, but those who would conserve and have made great strides in that direction, have to bear witness to the truth of the old saying that it is hard to be rid of a bad name. Besides, notwithstanding the overwhelming sentiment and active work towards restora-

tion there is yet a large element that insists that the minerals, the woods, the birds, the wild animals and the fish are God given to the people, free to be done with as the finder wills, and who contends that his personal interests are paramount to those of the community.

From the Gulf of St. Lawrence to the Gulf of Mexico, there were almost unbroken forests that extended from the shores of the Atlantic to the prairie lands of the Mississippi Valley. The colonists laid waste forest areas. They ploughed, sowed and reaped food stuffs without doing anything to maintain the fertility of the land, they swept the waters of fish. Their children and children's children followed their example, until the forests nearly disappeared, much land became infertile, the waters decreased appreciably in volume and in many instances entirely depopulated of fish life.

With conditions as they now exist, and with the vastness of the sea water supply within their ken, it



The Shad.

There is a reason, though not a palliation, for the wasteful streak in the composition of Americans. When the pioneer immigrants from Europe landed on the coast of North America they found apparently boundless natural wealth, beyond their wildest dreams. The treasures of the land, air and water seemed to their eyes to be inexhaustible and made intoxicated and reckless by the unexpected wealth, squandered it.

is hard to conceive an idea of the multitude of fresh water life from the latter part of the seventeenth century to the beginning of the nineteenth. Early writers themselves found words inadequate to convey a comprehensive idea of its magnitude. The best that one of them could do when dealing with shad in the Delaware and Susquehanna Rivers was, "They came in such vast multitudes that the still waters seemed filled with eddies, while the shallows were beaten into foam by them in their struggles to reach the spawning grounds."

A modern writer on the herring, in order to show the possibilities, other influences not preventing, of its fecundity, said that if all the progeny of a single pair

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of herring were to reach maturity and their progeny were to survive and spawn, and this were to continue for about ten years, all the seas of the earth would be filled solid with herring, all the land would be submerged and all other creatures in the world would be crowded out of existence.

This is something all can understand. It is a simple case of arithmetic made even plainer when given as a further basis of calculation, the fact that an average mature female herring produces annually about 30,000 eggs.

All eggs of a female herring, however, do not hatch, neither do all the eggs of any fish. Nature has seen to that. She made most fish and many other forms of wild life, spawn eaters and carnivorous feeders, and arranged that under normal conditions only sufficient eggs hatch and the young reach maturity to maintain the species or a little more, until in the process of time she saw fit to exterminate it in favor of some other species, better suited to perhaps changed environments.

Man is the only creature that could and has upset the plans of nature for the continued existence of fish life. As man, in America, before the landing of Europeans was not only a negligible factor in nature's ar-

said that the chief demand was that they not be fed on salmon more than three times a week. In Philadelphia the strikers secured a clause in their indentures that they should not be given shad but twice a week.

Shad was undoubtedly the most important food fish in the early days of the nation on account of the greater coastal area of its habitat. They were eaten fresh, and were smoked and salted for winter use. During the spring runs, people travelled long distances in wagons to the shad rivers to obtain their winter's supply. With ham it was the chief article of flesh food for the whole year for those who dwelt in the country. A Pennsylvania writer in the middle of the last century said, "leaning on the gate after breakfast, I asked the children passing to school what they had in their little baskets for dinner, and the universal answer from the cheery upturned little faces was 'bread and shad'."

Although shad was undoubtedly one of the principal foods in colonial times it was not everyone who would admit making a practice of eating it. The name shad was derived from a similar appearing European species of fish of very inferior quality, and rarely eaten excepting by the very poorest and commonest classes. Hence, notwithstanding the toothsome qualities of the



The Alewife, Gaspereau, or Brank Herring.

rangements, was indeed rather helpful, by dwelling a little on the possibilities of the herring as just noted a faint but better realization may be had of what the quantity of fresh water life must have been in primeval days.

Shad swarmed each spring from mouth to headwaters in every river from Maine to Florida, and other anadromous fishes were equally abundant in all the tidal streams of the latitudes in which they belonged. Among these may be prominently mentioned the striped bass, sometimes called rock, one of the most valuable food fishes. Prior to 1850 it was not uncommon for a single fishery on the Delaware River to take from 500 to 1,000 striped bass in one day. As late as the close of the Civil War on several occasions over 10,000 shad were taken in one haul of the big seine net at Gloucester on the Delaware.

Every river flowing into the Atlantic along the New England coast was over-run annually with salmon. Atlantic salmon, to-day the most expensive fish in the markets, was so cheap and common that it was almost a daily article of food in the New England states, Pennsylvania and New York. Its use was so extensive that in a great strike of apprentices it is

American shad, many people, especially the English settlers in Connecticut, seldom ate it excepting when strangers were not around. There is a story in the early history of the Nutmeg State, that on one occasion, a family was about to begin a dinner off a fine roe shad, when a well known garrulous visitor was seen coming up the walk to the house. In a panic, the platter was hidden under the table, and cold meats substituted hurriedly, until the unwelcome visitor had departed.

As a matter of course, fish was one of the chief foods of the primitive Indians. Many of the tribes devoted as much or more time to fishing than to hunting. They were experts in cooking and curing, both fish and shell fish. It was probably from them that the colonists learned the superiority of a broiled fish over one that was fried. It was from the Indians that they obtained the wonderful secret of "planking" a shad or a white fish, the superlative method of cooking these two as well as certain other large delicately flavored fishes.

Harriott, an English writer in 1585 of a little book called, "A Voyage to Virginia," has this to say, in quaint Chaucer-like English, of the Indian methods of broiling and smoking fish:

"After they have taken store of fishe, they gett them vnto a place fitt to dress yt. Ther they sticke vpp in the grownd 4 stakes in a square roome and lay 4 potes vpon them, and other ouer thwart the same, the same like vnto an hurdle of sufficient heighth, and laying their fishe vpon this hurdle, they make a fyre vnderneathe to broile the same, not after the manner of the people of Florida, which doe but schorte (schorche) and harden their meat in the smoke only to Reserue the same during all the winter. For this people, reseruing nothings for store, thei do broile, and spend away all at once, and when they haue further neede they roste or seethe fresh, as we shall see hereaffter. And when as the hurdle can not holde all the fishes, they hange the Reste by the fyrres on sticks sett vpp in the grounde against the fyres, and than they finishe the rest of their cookerye. They take good heede that they bee not burnt. When the first are broyled they lay others on that weare newlye brought, continuing the dressinge of their meate in this sorte vntil they thincke they haue sufficient."

Primitive Indians are expert fishermen. They used seines, gill nets, trap nets, weirs, spears, bows and arrows, scoop nets, set lines, hook and lines, and even vegetable substances to stupify fishes. But though

tent with their state, and liuing frendlye toghether of those things which god of his bountye hath giuen vnto them, yet without giving hym any thanks accordinge to his desartes."

The colonists were not slow to adopt all the most effective of the various devices used by the Indians for catching fish. Having tools of steel and an inventive turn of mind, they made these devices more effective. From the brush weir they evolved the pound net and they enlarged and improved the racks so that not a fish could go down stream without being caught in them.

Of all the apparatus invented and improved for fishing purposes, the rack now variously known as fish basket, eel pot, and eel weir is the most dangerous and destructive. It is to-day the most difficult to get rid of legally or even to get under legal control, in sections where eels abound. It is unquestionably the most effective devise known for catching eels on their annual migration from the headwaters of rivers to the sea. As many as two tons of eels have been taken from a fish basket in one night.

With the Indian devices and others imported from Europe the work of ravaging the waters was begun and conducted actively and unrelentingly. The ap-



The Striped Bass.

they caught, unlike their immediate white successors, they did conservation work. They stocked and restocked, sometimes carrying fish and eggs considerable distances from one water to another.

As fisherman Harriot, to quote him again, has this to say of the primitive Indians:

"They haue likewise a notable way to catche fishe in their rivers, for hereas they lacke both yron and steele, they fasten vnto their Reedes or longe Rodds the hollowe tayle of a certain fishe like to a sea crabb, in steede of a poynte, wherewith by nighte or day they stricke fishes and take them off into their boates. They also know how to vse the prickles and pricks of other fishes. They also make weares, with settinge opp reedes or twiggs in the water, which they soe plant one with another that they growe still narrower, as appeareth by this figure. There was neuer scene among vs so cunnunge a way to take fishe withall, whereby sondrie sorts as they founde in their rivers vnlike oure, which are also of verry good taste. Doubtless yt is a pleasant sight to see the people, sometimes wading, and goinge sometymes sailings in those Rivers, which are shallowe and not deepe, free from all care of heaping opp Riches for their posterite, con-

parently inexhaustible supply of shad appreciably diminished, and shortly after the Civil War some of the best rivers for that fish scarcely yielded profitable returns. The Delaware River for example, from which early in 1800, when the population was small, more than \$200,000 worth of shad were taken annually, yielded in 1880 less than \$80,000, worth and that with prices ruling much higher than in colonial days. The majority of the rivers in New York and the New England states ceased entirely to be shad streams.

The sturgeon, in some respects the most valuable of all the commercial fishes was, by 1890 almost entirely exterminated. At one time they were in vast abundance in nearly every river visited by shad. The Great Lakes were full of a species that lives entirely in fresh water. The Delaware River, a large stream navigable for the largest vessels for more than one hundred miles, flowing from the mountains to the sea and separating the states of New York, Pennsylvania, New Jersey and Delaware, and on the banks of which is Philadelphia, one of the dozen largest cities in the world, was perhaps the most abundantly supplied with the huge ganoid fish, one of the few survivors of a long past age.

For many years it is said that seven-tenths of the famous Russian caviar was made from the roes of the Delaware River sturgeon. The fish were so numerous fifty or seventy-five years ago, that it was nothing uncommon for persons while being ferried between Philadelphia and Camden to see a number of the huge fish jumping. Nowadays it is doubtful if as many sturgeon are caught in a whole season as could be caught in one day in 1880 and before. From ten dollars a keg of about one hundred pounds, the price of sturgeon roe has risen to over one dollar a pound. The fish have become so scarce, that the catching of a large female is considered of sufficient importance to be recorded as a new despatch in the daily papers.

Of all forms of fish life the destruction of the sturgeon in both the rivers and Great Lakes was the most wanton and ruthless. In the earlier days the flesh was not considered as of much value as a food product. There was a prejudice against it, and few would eat it. "Nigger fish" it was often contemptuously called. It was finally fairly introduced on the market successfully under the guise of "Albany Beef."

As before then, it had little sale, and the big creatures tore the nets of the shad fishermen, an actual warfare of extermination was waged against the sturgeon. The young when caught were clubbed to death and thrown overboard by the fishermen. People living along the Great Lakes made up parties to go after sturgeon and kill them as parties are now sometimes made up to round up and kill noxious animals, and as is sometimes done in Australia to be rid of the rabbit and kangaroo pests.

But disastrous as was the work of those who fished without regard to the future conservation of the supply there were other elements that entered the field of destruction and completed the crime even more quickly and effectively. One was the manufacturing interests and the other canal companies.

National Government. The same interests completely wiped out the salmon from all the New England streams excepting the Kennebec and the Penobscot. The salmon would have disappeared from there also, only for the unselfish labors of the United States Government. It is a huge and scarcely profitable labor, and to use a phrase of one of the members of the United States Bureau of Fisheries only persisted in chiefly for "sentimental reasons."

The efficient method of the manufacturing interests to destroy the fresh water fisheries was to empty the filth and discarded poisons directly into the rivers and smaller streams, and to build dams over which fish could not pass. There is little blacker or more nearly criminal in the history of the country or an exhibition of greater disregard for the rights and health of the people than the pollution of the streams by manufacturing and other industrial interests. It is harder to repair the damage they have done, than all the acts of careless fishermen. To those who know the facts: have seen the dire results, and have the work of rehabilitation in hand, the faults of Judas Iscariot and of Benedict Arnold are more to be condoned and of less harm to the people than the ruin of the fisheries and the water supply for domestic purposes, wrought by the interests named.

In most of the New England States and Middle States and some of the middle west, where manufactures, mines and other industrial enterprises are in the greatest number there was hardly to be found twenty years ago an unpolluted stream. Some of them were and are yet so impregnated with filth that not a living thing, animal or vegetable is to be found in them. In some cases the stench arising is so great that only a person with an exceptionally strong stomach can approach the banks. In some a person bathing therein, will contract ulcerated sores, and cattle drinking the water will die.



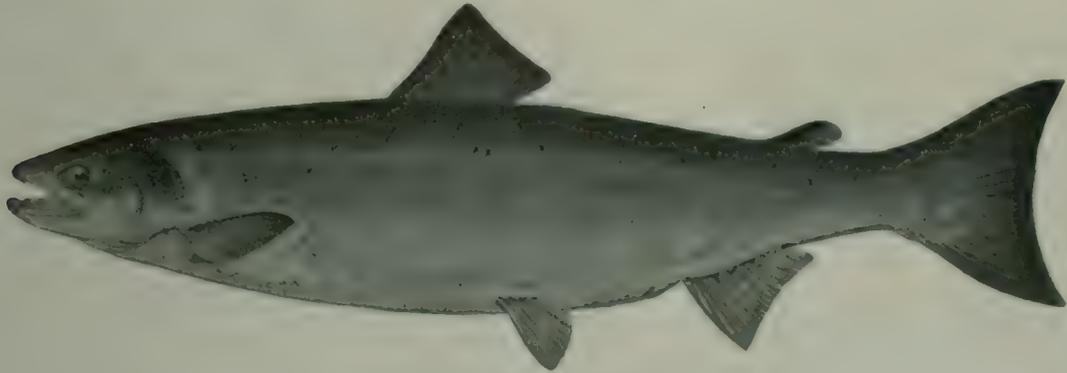
The White Fish.

It was the manufacturing interests that utterly destroyed and without much hope of their future restoration, all the shad rivers in New England with the exception of the Connecticut. Across this stream a huge dam forty-five feet high was erected a few miles above its mouth, and this barred the migration of the shad as well as other anadromous fishes. That stream, the only one in New England in which shad are found in any part thereof, is only maintained as a shad river by the most strenuous cultural efforts of the

As a class the manufacturing and industrial industries bitterly resisted and many still resist all efforts to have stream pollution stopped. The present German Kaiser could not more arrogantly uphold his rights and resent their being questioned, than the majority of mill, factory and mine owners a few years ago, when steps for conservation and the rehabilitation of the waters for domestic purposes and fish life were in their infancy. "What" they would exclaim angrily when protest against pollution was made, "Would you

destroy our great industries for the sake of a few fish; for the sake of the cattle of a few farmers or the health of a few people! If people want fish let them go to the sea or somewhere else and get them. Let the farmers dig wells for water for their cattle. Let the few people who live along the water courses where we empty our refuse into go somewhere else where the water is better."

things. The beginnings for conservation were not much more than fifty years ago. To pleas for some consideration for the rights of posterity, fishermen, mill and mine owners took the same stand as a certain notorious stump speaker, on the same question. "Posterity," he cried contemptuously. "Why should we consider posterity? What has posterity ever done for us."



The Atlantic Salmon.

Astounding and incredible as this little speech may seem, it was actually uttered by the owner of a big industrial plant about thirty years ago before a Legislative Committee that had under consideration a very modest bill designed to abate water pollution and a meeting at which the writer was present as one of the drafters of the bill. The speech seemed astounding to the conservationists present, but logical to the Legislative Committee for it killed that particular measure.

The awakening of the public did not come until the fresh water fisheries were well nigh ruined, and the sea water fisheries threatened. And the awakening was not sudden. It was gradual and almost discouraging to the small forces that were working for better

But the small forces increased, became powerful. They labored, they educated, and finally became strong to a point that they dominated the legislative assemblages. They organized a vast system of education. They educated the forester and the fisherman, and have made some progress with manufacturers and owners of industrial establishments. They banded the farmer and the fishermen into protective organizations. They had forestry and fishery matter introduced into the public school system, they encouraged and developed fish culture, they have started to establish public aquaria in the leading cities.

Some of the wealth so recklessly thrown away is returning, but it will be years before the great natural wealth that was ours is restored.

OUR FISHERY.

Trade Review Report, June 9.

Notwithstanding the increased cost of outfits, there is a spirit of buoyancy evident among the fishermen who have undertaken the Labrador voyage this year.

This spirit is part and parcel of our hardy toilers, and, though underlying during the other seasons of the year, it comes to the surface in the spring, and gives stimulation to all and sundry to be up and doing.

After all is said and done, the cod fishery still remains the staple product of our Island. It is a great speculation, and the results are often fatally uncertain, but in its prosecution there is no uncertainty.

If all goes well, and good catches result, this year will probably be a record year for prices, and will be extraordinary profitable to those engaged therein.

The system of cold storage now being inaugurated will, when fully in force, relieve any surplus which otherwise would tend to decrease the value of hard-dried codfish. It will likewise enhance the commercial value of other branches of the fishery, salmon, caplin, lobsters, etc.

The possibility of an evenly distribution of baits at the principal outports should aid the fishermen in the fall catch, when baits in their immediate localities cannot otherwise be obtained.

The establishment of auxiliary resources, such as

cold storage which will continue for all time, is a model way to endeavor to offset in a slow, steady manner, the high cost of living.—Trinity Enterprise.

FIRST SWORDFISH OF THE SEASON.

Dealers Quoted 25 Cents Pound For Them This Forenoon At Pier.

Gloucester Daily Times, July 22.

Receipts at the Boston fish pier today were extremely light, one with mackerel and one craft with tilefish being in. The latter had 50,000 pounds, besides a small quantity of hake and one swordfish.

Sch. Virginia arrived yesterday afternoon with the first swordfish fare of the season, having 37 fish in count. Swordfish this morning was quoted at 25 cents a pound.

Boston Arrivals and Receipts.

The arrivals in detail are:

Sch. On Time, 3,600 large and medium fresh mackerel.

Sch. Waltham, 50,000 tilefish, 3,500 hake, 1 swordfish.

Arrived Yesterday.

Sch. Virginia, 37 swordfish.

Haddock, \$6.50 per cwt.; large cod, \$6; tilefish, 3½c lb.; pollock, \$3 to \$3.50; fresh mackerel, 12c lb.; swordfish, 25c lb.

To Increase the Consumption of Fish

COLIN McKAY.



"IT IS a question of prime importance, the cultivation of markets for fish," said a prominent fish merchant of Boulogne. "Since the war our difficulty has been to procure fish to sell, but before this question was receiving a good deal of attention. One of the duties with which the Fishery Bureau of the Republic was charged lay along this line.

"Of course, in most good hotels and among the wealthier classes generally, fish usually from a course at one or two meals daily; here in France fish is a rare axis on the breakfast table, though in England finnan haddie appear to be almost as popular in some places as the inevitable bacon and eggs. The problem for the fishing industry is to increase the consumption of fish among the working people. The nutritive value of fish does not need to be demonstrated; the figures of savants, often published, should suffice. But men who live by hard labor make an objection to fish that must be considered. They say a repast of fish digests itself too quickly (*ne tenait pas au corps*), does not stick to the ribs, according to the popular expression. When the Germans were developing their fishing industry with characteristic energy and thoroughness they met with this objection, and they answered it. Their newspapers were filled with articles on the subject. They said, treat fish like meats—serve it with vegetables make soups and chowders. In their methodical and thorough fashion the German fishing societies circulated hundreds of thousands of booklets, instructing housewives how to prepare appetizing and satisfying meals from fish. These barbarians, no doubt, learned a good deal from the Americans. On a visit to Boston some years ago I sampled their famous fish chowders; enjoyed also a fine dish prepared of dry salted fish, served with potatoes, Irish turnips and greens, morsels of pork, and plenty of the fat of pork. These dishes gave the feeling of repletion which follows a good meal, without the heaviness which comes of indulgence in too much of baked meats. Also these dishes stood by one. This business of instructing the work-people as to the cooking of fish with proper accessories has made progress considerable in France, but there is much yet to do.

"As patrons of the fishing industry, we do not discharge our duty to the nation, or ourselves, by telling housewives how to cook and serve fish. This problem of promoting the consumption of fish has other aspects. Not the least important is—what shall I call it?—the psychological aspect. Most of us are creatures of habit; the most contented people in the world are those whose lives run in a routine as secure from interruption as the movements of the planets. If the people of a household acquire the habit of eating fish on certain days, then it is our duty, our business, to see that nothing happens to interrupt that habit. That is to say, we must be prepared to put on the market a regular supply of fish. Also it is of first importance that the fish be placed on the retail markets in good condition, and at prices within the reach of the working people. This requirement raises a whole series of considerations. It raises, for example, the question whether for the wholesalers co-operation, may not be more profitable than competition in the long run. If I am for one week, unable to supply the retailers,

who ordinarily look to me for supplies, the habit of a certain circle of consumers is interrupted, and the following week they may show little interest in a fine supply.

"But co-operation between wholesalers on the lines I have suggested will not of itself be sufficient. Of a similar importance is the question of co-operation in the matter of transportation. Our experience in France may or may not be peculiar. In any case our production of fish has increased more rapidly than our consumption; we are exporters. Interest in this state of affairs lies in the fact that our fish consumption per head of population is relatively small. We have fairly good transportation facilities for fish to the larger cities; but we are not yet in a position to develop the market possibilities of smaller communities—a condition which confronts the fishing interests in other lands. Still some progress is being made, and it is largely along the lines of co-operative efforts and organization. As individuals we would not be able to offer sufficient business to railways to make them anxious to serve us; as societies we are able to put before them programmes which command their interest. Only by co-operation can we hope to establish depots at important points, from which local distribution can be made to the smaller communities. This matter of establishing depots for local distribution is receiving attention, and in time we hope to have a net-work of such depots, provided with cold storage facilities, established in all the centres of population in France."



Captain T. E. Ryder, manager of the St. John House of the Canadian Fairbanks-Morse Co., Limited, on leave of absence at the front, has just received his promotion from the grade of Lieutenant. He has also been awarded the Military Cross, and on more than one occasion has been mentioned in the despatches. He was, previous to the war, an officer in the St. John Battery. When the war broke out he immediately enlisted for active service and was attached to the Ammunition Column, Heavy Battery.

Capt. Ryder is one of the many big hearted patriotic men who are doing their bit for Canada and the Empire in the very thick of the battle.

The Pearl Button Industry

By ARTHUR A. ULLYOT,

Of Canadian Pearl Button Co., Limited, Trenton,
Ontario.

Few people realize that the beautiful pearl buttons used are obtained from a natural product of our inland waters. In order, therefore, to interest my readers in the conservation of one of our Canadian raw materials, the writer proposes to offer a few remarks on this important industrial subject from the point of view of a manufacturer.

The history of the pearl button industry dates back to about thirty years ago, when up to that time, fresh water clams were a menace to the American Government, in as much as that they formed beds in the Mississippi River, and hindered navigation. These beds had the habit of shifting from one place to another, which made it impossible to define a channel with any degree of certainty. They also usually formed their beds on the edge of a channel, just outside the main stream. A great deal of money was spent trying to solve this problem of navigation with no practical results, until a German farm hand, named Beppell, who in Germany had worked in the manufacture of horn buttons, conceived the idea that the shell could be worked into buttons. He therefore devised a crude machine for cutting the shells, which he made into buttons, and for which he found a ready market. This was the start of what has since become a very large industry, and in the United States they manufacture about 100,000 gross of buttons daily, and the consumption of shell is about 500 tons in the same period. When the industry was first started, and for some considerable time after, the button manufacturers believed that their supply of raw material was inexhaustible, and the waste at that time was almost unbelievable. They cut from one to three buttons out of a shell, whereas to-day they cut from one to two dozen. They also culled everything but the "Niggerhead" shell (*Quadrula Ebena*) which they preferred, as it was of a very fine quality. The price of the shell at that time ranged from \$3.00 to \$6.00 per ton, while to-day it is many times that figure.

There has been a great development in the machinery used for finishing the blank, as the first cut is termed, to a button. For the first ten years the work was done altogether by hand, which although the raw material was very cheap made the finished product expensive.

About this time Nicholas Barry, of Muscatine, Iowa, invented an automatic machine which faced and drilled the buttons, automatically doing the work previously done by the hand operators. Until this time pearl buttons were not in general use, because of their high cost. The saving of labor cut their cost in two, and they very shortly displaced glass, agate, horn and bone buttons. This increased demand stimulated the business, which very shortly diminished the visible supply of raw material. The manufacturers became alarmed and appealed to the American Government who in turn investigated scientifically the possible reproduction of the economic clam with the following results:

They discovered, contrary to the general belief, that they matured more rapidly than supposed. It was considered that it took about twenty years to attain an

economic size, but the investigation proved without a doubt that this was accomplished in from five to ten years, depending on the different species of shell. They also discovered that clam propagation was impossible without the aid of fish. The clam exudes its spawn, which in turn is cast off in the form of what is known as glochidia, which become parasitic on fish. After a period of encystment they drop off and lead an independent life. As a result of this the Government established propagation stations at different points, one at Rock Island, Ill., where thousands of fish laden with glochidia are released into the Mississippi with the result that they are fast replenishing their hitherto depleted supply. The bass is one of the principal "hosts" adopted by the glochidia of these large bi-valves and for that reason should be protected as also is the yellow perch, the sheepshead, and the gar



Fig. 1 shows shells known to the trade as pigtoes (above), Canadian three ridge (large central), and warty backs (below).

Until 1910, the Canadian manufacturer believed there was no raw material to be found in Canada, but on the 23rd of May of that year, the writer discovered a very fine quality of bi-valve in the Grand River, a pure white shell known as "three ridge" (*Quadrula heros*). These shell beds extend from the mouth of the river for a distance of about twenty miles and also in the feeder which runs from the Grand River to the Welland canal for a distance of about five miles. Since 1910, my firm has been operating here,

employing yearly a great number of fishermen with the inevitable result that the supply each year is diminishing. The main reason of this may be the quantity we have fished, but two other reasons are probable, namely, the diminishing of the fish "hosts," and the pollution of the water by sewerage.

The American Government receives no remuneration from the parties who control the fishing industry there, while here, we pay the Government of Ontario a fee of \$1.00 per ton for every ton fished, and would have no objection to paying more, providing something was done to stimulate a greater supply. We believe from the knowledge we have of the different rivers of the province, that the very finest quality of shell could be produced in sufficient quantities to supply all present and future demands at a cost which should pay the country for any outlay which it might make. There are a great many species of shell and each obtains its name from some peculiarity of its shape, that is some resemblance to some object in general use or otherwise, such as the washboard (*Quadrula heros*), the pigtoe (*Quadrula undulata*), the niggerhead (*Quadrula ebena*), the butterfly (*pegiola securus*). The wash-

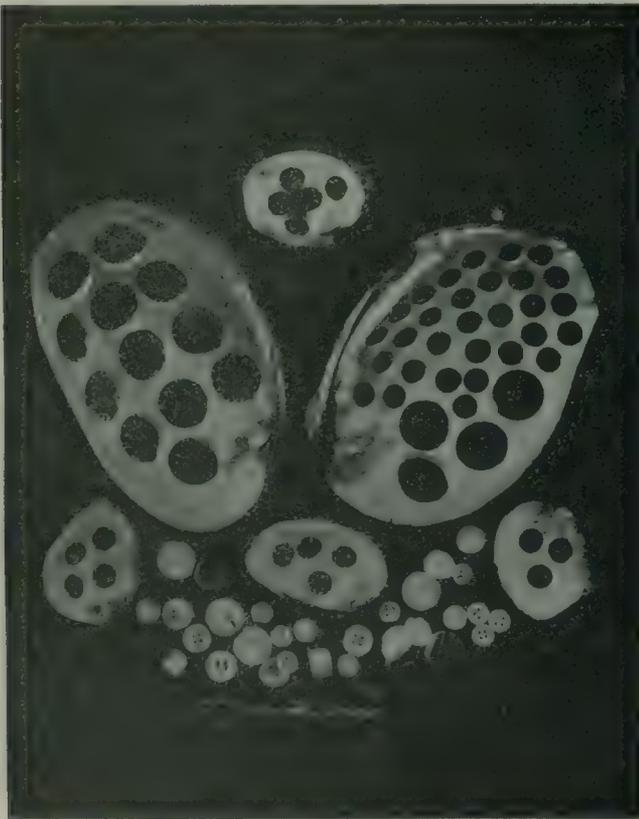


Fig. 2 shows large Canadian three ridge, small American pigtoes, blanks and finished buttons, crow-foot.

board or three ridge shell has three ridges on its back, such ridges as are found on a washboard, the pigtoe is somewhat after the shape of a pig's toe, and the niggerhead is round and black, and the butterfly resembles the shape of a butterfly's wing. In all there are about a hundred varieties. We have here in Canada large quantities of what are known as paper shell (*lanpsiles laevisima*). These latter are very thin and easily broken, and consequently of no value to the trade. There are a great many qualities of the same economic variety of shell, as each river produces a

different quality. The difference is in the texture which is very important to the button manufacture, as for instance, the Grand River washboard is snow white, and of a very fine texture, the Ohio River washboard is very much discolored and coarse in texture which causes a great deal of breakage in the course of manufacture. The finest quality of shell is the northern niggerhead because of its iridescence, while the southern niggerhead while iridescent does not work up nearly as well. For this reason the manufacturer is very particular in buying shell to have specified the river from which the variety of shell he is buying has been fished. The farther north shell is fished, the whiter it is, and the finer its texture, hence the necessity for Canadian production of the valuable raw material.

The different methods employed in fishing shell are as follows:

The crowfoot method which is most commonly used is to attach wire hooks to a piece of cord about 15' long, one hook to the end of each cord, which are tied securely to a gas pipe $\frac{3}{4}$ " in diameter, and about 8' long and about 8" apart. To this pipe is secured a light weight rope, and dropped to the bottom of the river, when it is dragged some distance from a row boat. The idea is that the bar carries the hooks to the bottom, and acts as a sinker, but its main function is, that as it is dragged over the clams, it startles them when they close, and as they do close quick it catches one of the hooks passing over them and hang on. This method can be used in any depth of water. Another method and the one which we are using here is to tow behind a gasoline launch two flat bottom boats, in each of which is a man with a heavy scoop net, fitted with strong iron teeth which he drops along the river bed, the teeth sink into the mud sufficiently to get under the clams, and the momentum at which the boat is going rolls the clams into the basket of the scoop. This method is very satisfactory where the water does not exceed 18' in depth, but at a greater depth it is impossible to handle the scoon. Where the water is quite shallow they wade in and gather them by hand, which is the fastest method there is, but unfortunately it is not often they are found where the water is shallow enough to permit this method.

When the clams are fished they are taken to the shore, where they are cleaned in the following manner. They are put in shallow pans, where they are cooked until they open of themselves. A live clam is a powerful fish, and has wonderful resistance. After they are cooked they are allowed to cool, and the men employed at this work separate the meat from the shell, and incidentally look for pearls. A great many brogues are found, but very rarely a valuable pearl. The clam being cooked, makes an ideal pig feed, and as many as can be disposed of for that purpose is done so by giving them to farmers who come for them once a day. A quantity is also disposed of to farmers for fertilizing purposes, but the supply is usually so great, that the greater quantity has to be buried. Mr. Feilding has investigated fish wastes and tells me it is a very valuable food for young trout in a fish breeding establishment, indeed far more valuable than liver, the usual food employed. Further, Mr. Feilding tells me that by a special process the waste product can be converted into a useful food for live stock on the farm, competing with any now on the market.

The shells after cleaning are shipped as soon as possible to the factory, where they are put under cover,

as rain and sun have a disastrous action on the shell, as the latter consists of thin layers of practically pure carbonate of lime which break down under the action of air density, humidity or otherwise.

Such is the history of the clam which is so extensively used commercially in the following products: pearl buttons, crushed poultry shell, dust used as filler for fertilizing and varnish makers lime.

In offering these few remarks on the industry in which the writer is interested, he has done so with the object of bringing to light a condition in his trade not altogether desirable, namely, the dependence of his

firm and all others in Canada or the United States as the source of supply of these clams. In Canada we have the water, climate, geological conditions necessary for the production of an almost unlimited supply of economic mussels. Why is it that the "powers that be" have not realized? There is no aquatic biological survey of our waters on which the manufacturer can rely as a source of information as to the whereabouts of these shells; there is no legislation on the Statute Book to protect and conserve our raw material, and finally there is no effort being made to artificially propagate these clams in waters we know to be well suited to their proper development.

Some Yarmouth History



"THE history of Yarmouth fishing, the present operations, and the prospects for the future." That's some text the editor has given me to handle in one small article. Of course, there is a firstly, secondly and thirdly, and each one of them would require considerable time if handled exhaustively. A history of fishing would be in many ways a history of the town as Yarmouth has always, from the first year it was settled been interested in the fisheries. And why not? She is situated near the best fishing grounds on the Atlantic shores, where fish of all kinds can be taken in abundance, and she is in easy reach of market which will buy all kinds of fish taken at a good price. And not only that, she has got the men who know how to catch them; whose knowledge has come down to them from sires who in their turn got their knowledge from their sires, and so on from generation to generation. The very first settlers, who came here in 1761, brought with them a shallop, named the "Pompey," a vessel of about 25 tons. Of course, it was used to carry its owners and their household effects to their new home here, but after arrival it is safe to say that she was engaged in fishing more than in any other occupation. Seth Barnes, one of the original settlers, seems to have been the big ship owner of the day. In 1762 he owned the schooner Elizabeth; in 1771 he also had a sloop; in 1772 the schooner Polly; in 1775 the Pelmel, and a half interest in the Ranger, and in 1783 he is recorded as owning the Dove. In this latter year he was lost, the records saying briefly: "Schooner Polly, — tons, Seth Barnes, master and owner, sailed from Boston for Yarmouth with a cargo of supplies, and was not afterwards heard of." (Lawson's Record of Yarmouth Shipping). All these vessels were undoubtedly fishing vessels, as the great wealth of the sea would be the first attraction for the pioneer settlers. Referring again to Lawson's, one cannot be but struck and fascinated by the wonderful tales of adventure, peril, disaster and death, which it unfolds in brief paragraphs on every page. And behind many of them we can see in imagination the homes made desolate, the widows mourning for their husbands, the children for their fathers, and the mothers for their sons. And the fateful words is so many cases are, "Sailed from — for —, and was not afterwards heard of." Yes, Yarmouth has earned its place in the fishing world in blood and tears, and many is the Yarmouth fisherman

who has gone to his long home while pursuing his calling. When we consider that even in these days, when our shores are safeguarded by every means in man's power, that the loss of life is still appalling we wonder how these old mariners did so well and admire them all the more for their hardiness and bravery.

A careful study of these records shows that many vessels of which, no doubt the majority were used for fishing during part of the year at least, were lost either going to the West Indies or returning from there. For over a century Yarmouth carried on a big fish business with the West Indies, running her own fleet of vessels. The first to engage in the trade was the same Seth Barnes, previously referred to. He left Yarmouth as skipper of his own schooner, the Polly, on the 5th of December, 1775, and returned on the 25th of April, 1776. Among his crew was John Allen, hired at 40s. per month, who took out two quintals of codfish as a venture. A second trip in the same vessel was made, starting on the 9th of January, 1780, and lasting about four months. The business started in this humble way by Seth Barnes, was followed up by a worthy band of successors, and many a hundred cargoes of fish, lumber and potatoes have been taken out and exchanged for sugar, molasses and rum. Fish, caught by our own vessels, "made" by our own men, has always been the principal item of export to the West Indies, and is an important item to-day, although not so large as before the time when the fresh fish business between Yarmouth and Boston came into existence.



AND how the fishing has changed during the years! In Seth Barnes' time and for many years afterwards cod was the king of all — just as it is in Labrador to-day. All other fish were comparatively worthless except perhaps for herring and mackerel. It has only been in recent years that haddock has been considered as good eating, and I have talked with men who can remember the time when they would swear when there was a halibut on the hook. The only thing to do with him was to cut him loose just as they do with the skates to-day. Lobsters! Nobody troubled about catching them and they were not looked upon as a commercial possibility at all. As a change in the menu, perhaps, a fisherman would take one or two for his own table, and if he got two cents each from some town customer he considered that two cents as good as money picked up. And the change is still going on.

Ten years ago the writer can remember seeing horse mackerel, so called then, but now exported as albacore and tuna, lying on the beach rotting, having been allowed to drift ashore from the weirs and traps where they had been caught and killed. Swordfish were treated the same way even later than that, and I doubt even now if an average of one fisherman in a village can be found who has had either albacore or swordfish on his own table although big money is made in exporting them. Probably the next revolution will be with the gray fish (the new official name for dog fish), and I would not be surprised to see a large export trade grow up with them, although fishermen laugh at the idea now. But they also laughed over lobsters, haddock and halibut!

Previous to the advent of the steamers Yarmouth and Boston, a little over a quarter of a century ago, our export trade in fish consisted entirely of the cured product. After these steamers came on, a few dealers commenced to ship fresh fish. It was found that the fish could be landed here on boat days, iced up, shipped to Boston, and opened up in such splendid condition that it could compete with the T wharf and Gloucester catches right in the market. Except for lobsters and mackerel the business was not pushed to any great extent for some years. Other boats, the Prince Edward, Prince George, Prince Arthur, were added to the Boston fleet, and, urged on by higher prices and insistent freight and traffic managers, the business commenced to grow apace. But the biggest boost was given it when the United States congress passed the Underwood tariff bill. Before that the Yarmouth fishing fleet had dwindled to practically nothing, except for a few boats, and the former fish wharves—some of the best water front properties in town, were falling into ruin. The first result of this new tariff was when Elmer E. Pryor and his associates, of the Boston T wharf, came here and succeeded in floating the Consumers' Fish Company (now the Consumers' Fish and Cold Storage Company), which has been carried on successfully ever since under the management of George R. Earle, a Yarmouth boy; then Henry A. Amiro, a Pubnico man, saw the possibilities here, and as he owned a fleet of half a dozen schooners, he went into it on quite a large scale and to-day is doing a big business. Later came the Gateway Fish Company, a company of local young men. They were handicapped at first by lack of capital, but ran the business in a conservative way for a year or two, when the present manager, J. M. Walker, took control. Since then it has acquired a large number of boats, and has boomed. Last year the New York and Yarmouth Fish Company was established. They have bought several vessels and to-day are doing a good business. This year S. Epstein, the first Hebrew to go into the fish business in Yarmouth so far, started operations. He has so far purchased four small vessels and is handling considerable fish. Then there are the two older companies which have been dealing in salt fish particularly for years, Parker, Eakins, Limited and the Yarmouth Trading Company. Both these concerns do a large West India business, shipping principally by boat, via Boston and New York, although the Yarmouth Trading Company operates the only direct West India packet we now have, the schooner Palmetto.

The possibilities for the future are great, but increased shipping facilities will have to be provided. As the fishing boats increase, and there should be many, very many more, the steamers will be overtaxed, in fact, they are now, and it will be impossible to put

the fish on the market in the condition they should be. The companies and dealers are demanding boats—more boats—for trawling purposes; boats from thirty to forty feet long, to carry two men are preferred. The Gateway Company particularly is carrying on extensive experiments as to the proper style of boat for these waters. We have good boats, but it is felt they can be improved and what they are looking for is a good sea boat, but yet a boat adapted for the easy hauling of trawls. Boats are being built and launched right along and almost every one shows some improvement over its predecessor, but the perfect boat is not of such importance as the proper number of boats, and its boats we want.



AS far as our resources are concerned, why, there is nothing to beat us. Yarmouth is right on the grounds; the fishing commences right close inshore and extends off to Browns'. The fact that this is no bottom for steam trawlers makes a fisherman's paradise for the boats. There are good harbors all along the coast and Yarmouth itself affords every facility. Located right as we are, just where the Bay of Fundy branches off from the Atlantic Ocean, we have good fishing all the year round for vessels, although the months of February and March are possibly too stormy for boats. Our halibut fishing, that is for the best grades of halibut, comes in a time when no other locality is taking that grade. Shoal halibut, it is well known, are of the finest possible variety, and the season lasts from March until the dogfish—pardon me, I mean gray fish—strike in. Then comes the cod fishery, the haddock fishery, etc. to say nothing of mackerel and herring.

Lobsters, probably, are our chief fish export, in fact, Yarmouth has the reputation of doing the largest export business in live lobsters in the world. During the season—from December to June—our whole shore is lined with pots, and thousands of dollars' worth are shipped on every boat. And it is in connection with the lobster export that the fishermen are demanding better transportation facilities. The boats have no cold storage and if anything happens to delay them, as there is sure to be several times during the season, a large lot of the shipment dies and the fishermen is out of pocket. The last trip of lobsters carried over this year was delayed, and five-sixths were dead when landed in Boston and were a total loss. The excessive freight rates also are a bugbear, but possibly, in these abnormal times, excessive rates must prevail.

What the town needs now is a good cold storage plant, even if only of sufficient capacity to handle the bait required for the vessels and boats. This season, on a number of occasions, vessels have had to go to St. John or Lockeport for bait, and the delay thus caused is a serious one.

Summing it all up the principal needs of the fisheries in Yarmouth are:

More boats.

Better transportation facilities.

Reduced freights.

Cold storage.

Given those, we can produce the men, as the country is full of good fishermen—men who require to take lessons from no one.

Canada's Fisheries for May, 1917

Fishing operations were carried on during May under unfavourable weather conditions on all parts of the coast. Notwithstanding this handicap, however, such fish as cod, haddock and halibut were landed in much greater quantities than during the same month last year. There was a phenomenally large catch of haddock landed at Ingonish, Victoria County, N. S., the total amounted to 80,000 cwts. for the month against 2,809 cwts. for the same month in the preceding year, all the traps in the vicinity had an equal share of the big run of fish.

In the Canso district of Guysboro county there were 16,672 cwts. of haddock and cod landed as against 12,595 cwts. in May, 1916. In Lunenburg country there were 25,850 cwts. of cod and haddock landed in place of 9,917. In Digby county, May this year gave 10,458 cwts. against 8,772 cwts.

The sardine fishery during May in Charlotte County, N.B., gave rather poor results; not more than 6,615 barrels being taken as against 37,837 barrels in May last year. In the course of the month some large catches of alewives were made by weirs and nets in St. John harbour.

In the counties of Bonaventure and Gaspé, Quebec,

there were 3,730 cwts. of cod landed against 10,120 cwts. during May last year. The shortage in the landings is caused by the backward state of the spring this year. At the Magdalen Islands fishing, generally, was not very successful. The quantity of herring taken during May amounted to 95,600 cwts. against 122,000 cwts. for the same month last year.

The catch of lobsters for the month on the whole Atlantic coast amounted to 140,718 cwts. for the same month last year the catch was 166,102 cwts.

Since the opening of the lobster season on November 15th until the end of May there were packed 73,831 cases, while 57,410 cwts. were shipped in shell. During the corresponding period last year 87,398 cases were packed and 83,022 cwts. shipped in shell.

In the course of the month four men in Nova Scotia, one man in Prince Edward Island and one man in New Brunswick lost their lives while engaged in fishing.

The values herein shown are based on the prices of the various kinds when first brought to land by the fishermen. The figures contained in the Monthly Bulletins are subject to revision before publication in the Annual Report.

Summary of the Quantities and Values of all Sea Fish caught and landed in a Fresh or Green State; and an estimate of the Quantities Marketed, or intended to be marketed, fresh, dried, pickled, canned, etc., in the WHOLE OF CANADA, for the MONTH of MAY, 1917.

Totals for the Month of MAY, 1916.

Kinds of Fish.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.
	Quantity.	Value.		Quantity.	Value.	
SALMON, cwts.	7,542	\$ 80,818	.....	8,022	\$ 72,560	.....
" used fresh (or frozen), cwts. ....	.....	.....	5,822	.....	.....	6,708
" canned, cases ....	.....	.....	1,874	.....	.....	1,324
" smoked, cwts. ....	.....	.....	86	.....	.....	6
" mild cured, cwts. ....	.....	.....	.....	.....	.....	128
LOBSTERS, cwts.	140,718	951,300	.....	166,102	1,067,902	.....
" canned, cases. ....	.....	.....	57,552	.....	.....	66,837
" shipped in shell, cwts. ....	.....	.....	25,591	.....	.....	32,420
COD, cwts.	70,178	197,471	.....	51,614	97,597	.....
" used fresh, cwts. ....	.....	.....	11,700	.....	.....	9,538
" green-salted, cwts. ....	.....	.....	6,141	.....	.....	3,090
" smoked fillets, cwts. ....	.....	.....	147	.....	.....	.....
" dried, cwts. ....	.....	.....	15,252	.....	.....	11,962
BLACK COD, cwts.	8,630	40,140	.....	4,959	24,127	.....
" used fresh, cwts. ....	.....	.....	7,660	.....	.....	4,459
" green-salted, cwts. ....	.....	.....	6	.....	.....	12
" smoked, cwts. ....	.....	.....	479	.....	.....	238
" dried, cwts. ....	.....	.....	1	.....	.....	.....
HADDOCK, cwts.	121,056	186,762	.....	23,206	36,566	.....
" used fresh, cwts. ....	.....	.....	35,030	.....	.....	7,725
" canned, cases. ....	.....	.....	458	.....	.....	481
" smoked, cwts. ....	.....	.....	2,584	.....	.....	1,235
" green-salted, cwts. ....	.....	.....	30,751	.....	.....	1,164
" dried, cwts. ....	.....	.....	6,206	.....	.....	3,304
HAKE AND CUSK, cwts.	7,050	10,755	.....	15,182	16,149	.....
" used fresh, cwts. ....	.....	.....	808	.....	.....	1,414
" green-salted, cwts. ....	.....	.....	10	.....	.....	.....
" smoked fillets, cwts. ....	.....	.....	618	.....	.....	.....
" dried, cwts. ....	.....	.....	1,455	.....	.....	4,590

POLLOCK, cwts.	22,125	34,790	.....	6,397	6,691	.....
" used fresh, cwts. ....	.....	.....	.....	6,281	.....	586
" green-salted, cwts. ....	.....	.....	.....	2,010	.....	634
" smoked fillets, cwts. ....	.....	.....	.....	33	.....	.....
" dried, cwts. ....	.....	.....	.....	3,909	.....	1,514
HERRING, cwts.	301,360	183,053	.....	370,417	155,629	.....
" used fresh, cwts. ....	.....	.....	.....	12,027	.....	18,221
" canned, cases. ....	.....	.....	.....	3,204	.....	725
" smoked, cwts. ....	.....	.....	.....	27,140	.....	27,594
" dry-salted, cwts. ....	.....	.....	.....	2,000	.....	3
" pickled, brls. ....	.....	.....	.....	11,952	.....	16,385
" used as bait, brls. ....	.....	.....	.....	52,955	.....	64,679
" used as fertilizer, brls. ....	.....	.....	.....	43,849	.....	58,991
MACKEREL, cwts.	2,299	18,383	.....	158	1,261	.....
" used fresh, cwts. ....	.....	.....	.....	2,299	.....	158
SHAD, cwts.	1,412	8,293	.....	2,037	11,059	.....
" used fresh, cwts. ....	.....	.....	.....	1,382	.....	1,937
" salted, brls. ....	.....	.....	.....	10	.....	33
ALEWIVES, cwts.	30,120	35,063	.....	26,852	28,081	.....
" used fresh, cwts. ....	.....	.....	.....	8,235	.....	9,933
" salted, brls. ....	.....	.....	.....	7,295	.....	5,640
SARDINES, brls.	6,615	54,040	.....	37,837	76,959	.....
" canned, cases ....	.....	.....	.....	16,200	.....	14,000
" sold fresh and salted, brls. ....	.....	.....	.....	3,375	.....	35,037
HALIBUT, cwts.	35,810	338,943	.....	24,157	138,626	.....
" used fresh, cwts. ....	.....	.....	.....	35,810	.....	24,109
" smoked, cwts. ....	.....	.....	.....	.....	.....	24
SOLES, cwts.	1,623	5,248	1,623	203	979	203
FLOUNDERS, cwts.	1,880	3,260	1,880	834	956	834
SKATE, cwts.	390	777	390	224	327	224
SMELTS, cwts. ....	.....	.....	.....	13	88	13
OULACHONS, cwts.	125	750	125	1,135	3,487	1,135
WHITING, cwts.	1	4	1	16	48	16
TOM COD, cwts.	8	40	8	10	50	10
OCTOPUS, cwts.	12	96	12	25	175	25
CLAMS, brls.	3,447	4,986	.....	4,741	6,459	.....
" used fresh, brls. ....	.....	.....	.....	1,617	.....	2,216
" canned, cases. ....	.....	.....	.....	1,830	.....	2,525
SCALLOPS, brls.	200	500	.....	280	560	.....
" shelled, gals. ....	.....	.....	.....	400	.....	560
CRABS, COCKLES, etc., cwts.	374	2,199	374	554	1,985	410
SQUID (bait fish), brls. ....	.....	.....	.....	260	520	260
LAUNCE (bait fish), brls. ....	.....	.....	.....	600	320	600
TOTAL VALUE ... ..	.....	\$2,157,671	.....	.....	\$1,749,161	.....



The BERIC Electric Signal Lamp which is fitted with a Morse Key, was designed by the British Ever Ready Company, of London, England, for Marine and Military Signaling. The lamp is strongly constructed of Polished Ragoon Teak, with solid brass bound corners and is capable of withstanding very rough usage. In addition to the Morse Key, the lamp is fitted with a switch enabling it to be used as an ordinary electric lantern. Two spar bulbs are fitted inside the case, the leather handle is re-

movable enabling the lamp to be carried on a shoulder strap.

Numbers of these lamps have been supplied to the Admiralty and War Office for use by submarine chas-

ers, trawlers, etc., and also to fishing fleets, yachtsmen, etc. The makers claim the lamp is always ready for immediate use and cannot blow out or jar out and requires no cleaning and only a minimum amount of care. It is fitted with a powerful Dry Battery which will give about 18 hours light, the battery is standard size and is easily procurable.

The lamp can be read from four to seven miles on land and up to fifteen miles at sea.

Spielmann Agencies Reg'd, No. 45 St. Alexander Street, Montreal, who are the Agents in Canada for the British Ever Ready Company, keep these lamps in stock and have supplied them to many Overseas Battalions, Military Regiments, Boy Scout Units, Yachtsmen, etc.

Robinson: "Do you think fishes can hear?"

Dobson: "I should hope not. Listen to old Smith - he smashed his rod!"

Book Reviews

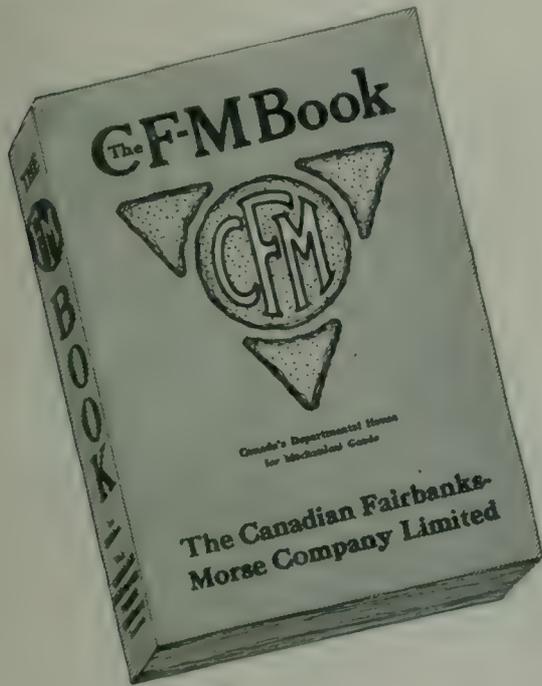
The "F. M. Book."

Even those best acquainted with the Canadian Fairbanks-Morse Company will be surprised at the very wide range of goods shown in their new general catalogue which they have called the "F. M. Book." This book is a marvel of complete mechanical information condensed into a convenient size for easy reference. It contains 1048 pages, and over 4670 illustrations.

It is, in fact, a key or index to the vast warehouses of "Canada's Departmental House for Mechanical Goods," and contains a very wide selection of "Made in Canada" Goods.

Twelve distinct departments are represented; each department covering a line of goods which is ordinarily considered a business in itself.

The Scale Department (52 pages) covers a full line of Fairbanks Scales.



The Valve and Steam Goods Department (138 pages) contains 42 pages of Valves, and 96 pages of Pipe, Fittings, Steam Specialties and Tools.

The Automobile Accessory Department (140 pages)—you will find practical accessory for Automobile, Ford and otherwise, besides a complete line of Motor Boat Fittings.

Engine Department (16 pages). Electrical Department (22 pages) — These pages are merely an index of the various styles of Fairbanks-Morse Oil and Gasoline Engines, Electrical Generators and Motors. Complete descriptive bulletins of this apparatus will be sent on request.

Pump Department (62 pages)—Here is shown a very complete line of Steam, Power and Hand Pumps, Duplex, Triplex and Centrifugal, besides a number of Pump Accessories and Windmills.

Machine Tool Department (110 pages) — Nearly every type of Machine Tool is represented; among them some of the best known Machine Tools on the Continent. Truly a representative department.

Wood Working Machinery Department (88 pages) —As fully representative as the Machine Tools.

Transmission Department (86 pages) — Every appliance for Transmission of power through belts, ropes, chains, conveyors, etc., is here shown.

Railway and Contractors Department (100 pages)—Containing Railway Track Tools, Motor Cars, Road Machinery, Trucks, etc., etc. A very interesting section.

Supply Department (138 pages)—Representing a line of Tools and Supplies for equipping any Factory.

Safe and Vault Department (26 pages)—showing a line of high grade Fireproof Safes and Vaults Fronts.

In addition to all this is a 65 pages section, printed on yellow paper, and containing beside, an excellent index, a quantity of tabulated information most commonly used.

A copy of the "F. M. Book" will be sent free to any one interested in mechanical lines, on receipt of their request.

SERIOUS SITUATION IN STRAITS.

Fishery Season on and No Salt.

The Western Star Curling, Bay of Island Newfoundland, June 27.

From Bonne Bay to Point Riche and all along St. John's Bay, there is a good sign of cod both with trap and trawl, stated Capt. Goobie of the S.S. Ethie when his ship reached Curling at 6 o'clock last evening from a regular trip to the Straits of Belle Isle. From Farrole to Flowers Cove traps are doing nothing, but trawls are doing well. On the Labrador side of the Straits from Bonne Espearance to Red Bay there is a good trawl and hook-and-line fishery, but nothing doing with traps when the ship went north but on Monday when the ship was coming south there was a slight improvement in the trap fishery and some traps at Blance Sablon had good catches. From Chateau to Battle Harbor there was no codfish either by trawl or trap up to Monday, though caplin had been on the shore for some time. It is apparent, however, that the cod are working eastward for on Monday some good catches were made at York Harbor ten miles east of Red Bay.

Some two or three cargoes of salt and provisions have reached Flower's Cove, but all the other places on both sides of the Straits there is a great scarcity of salt, which is creating a very serious situation for the fishermen. At several places too, provisions, such as flour, etc., are scarce. The ship made a quick voyage, though she was delayed two nights with fog on Labrador coast.

THE LOBSTER SEASON.

The lobster season, which was extended one week, has closed. It cannot be said to have been a successful season. The second day after this fishing commenced, it will be remembered that a fierce gale swept the coast and a result the fishermen lost heavily in gear, and even since then the fishing has been none too good. It was on account of the rather hard luck of the men since the season opened that the Government extended the season for a week, and it is needless to say that the extension was appreciated very much.

We sincerely trust that our fishermen, now that they are engaged in other branches of the fisheries, will get in a good summer's work.



The Salmon Fishermen



FISHING is a dignified calling recognized from the earliest time in the story of man. In primitive religions, the fish was held in great veneration by the simple men who saw in it a symbol of creative power.

Fish as a religious symbol is now, perhaps, unintelligible to the majority of people and has become solely a thing of commerce, yet it is well to remind ourselves that in the dark days of mankind fish presented a wealth of mystery to men in the solving of which the brain of man was greatly exercised. This is written in order that fishermen may realize that they are members of no mean calling, and that, if they so desire, they can by reading and study emulate the example of their worthy brethren of years ago.

It is interesting to recall that the world's canning

sirable and that there is nothing new under the sun.

Napoleon was the wise man who spurred the inventive genius of Appert and paid the price, but England soon saw the utility of the preserving jar and took it as her own. To-day there is not a housewife in the British Empire who does not preserve fruit as did Nicholas Appert and without a thought as to how the discovery was made. By the same token, not much progress—so far as the average household is concerned—has been made in preserving fruits since the days of the Little Corporal.

In 1815 Ezra Daggert brought from England to America a process for canning salmon, lobsters and oysters, that began in the Western Hemisphere the preservation of food stuffs; and to-day hundreds of millions of people eat out of tin cans.

This brings us to treat of the salmon canning in-



Salmon Fishermen on the Skeena River.

industry was evolved one hundred years ago in France by Napoleon. The British fleet was successfully blockading French ports. Napoleon's army was embarrassed by the lack of food. He knew great wealth in valuable but perishable foods was wasted because there were in existence no adequate means of preserving them. This led him to offer a prize of 12,000 francs to anyone who would devise a practicable method of preserving foodstuffs other than by drying and smoking.

Nicholas Appert was the lucky Frenchman to win this prize. His method was to put the food to be preserved in glass jars, set them in boiling water and when the contents were thoroughly heated seal the jars. Yet Nicholas Appert merely built on the foundations truly laid by Spallanzain nearly fifty years before, proving again that the study of history is de-

dustry from the fishermen's standpoint. The fishermen are an essential part of the industry, whose raw material is fish. As the self-binder over-runs the wheatfields and puts up the grain into portable shape, so the fishermen with their nets over-run the fish fields, catch the fish in nets, dump them into their boats and take them to the cannery wharves where they can be handled by the canners. The fishermen are the middlemen between the fish and the canners.

Canning salmon is a process of manufacturing. Methods and principles of factory organization and administration are the essentials of a successful salmon canning enterprise. Of course the canner must get the salmon or he can't can them, still the catching of the fish is a co-operative business in which the favors are all for the fishermen and the canner acts solely as banker, philosopher and friend.

All that pertains to catching fish is pretty well standardized on the Pacific Coast. The fishermen attach themselves to a cannery for the season by regulation or of their own free will. They are supplied with nets and boats, provisions and oil, undertaking to pay for the same out of the catches they expect to make. Some few fishermen either with cannery gear or their own, make an attempt to fish whenever fish run throughout the year, their catches reaching the fresh fish market in the spring, fall and winter. But when we speak of salmon fishermen we refer to the army of 3,500 or 4,000 Whites, Japs and Indians who fish without cessation for the six weeks in June and July when the sockeye salmon run is on, and later when the pinks and the chums enter the rivers and the streams, driven by nature to spawn. From the 15th or 20th of June to the 15th of September every year this army of fishermen are working at the harvest which in the final issue produces the canned salmon of commerce.



A SALMON cannery when the fishing season is on is the centre of a cosmopolitan summer resort. When things are going at full blast, when the fish are running and canning operations are under way, a salmon cannery in British Columbia, with its environs, is a hive of industry, the cannery being the hive and the fishermen and their wives and children and the other employees in and around the cannery being the bees. A spectator gets the impression that things are humming. There is the noise of machinery in the cannery itself. There are the Indian women with white gloves putting the fish into cans. There is the constant coming of fishermen with fish, of scows tugged up to the wharf, of big steamers arriving with supplies and departing with cases of salmon. The place is over-run with fishermen, Whites, Japanese, Chinese and Indians, with machinists, with clerical persons, all seemingly having something special to do, though what it is the innocent spectator cannot tell. Yet he gets the correct idea when he sees bright tins of salmon taken out of the retorts and placed on the floor of the drying rooms, and further on, when he sees the cans lacquered and labelled and put into cases and the cases trucked on the steamer. Finally he makes up his mind that all these people are canning salmon.

Long before a salmon is caught and canned in a salmon cannery in British Columbia a lot of work has to be done by the manager of the cannery and his men. While the season does not open till the middle of June, yet the work of getting ready is begun before the 1st of May. Getting ready means that all equipment must be overhauled and made workable. The cannery store has to be opened and restocked. The housing arrangements for fishermen and help must be completed. In some places a whole Indian village must be transplanted and the inhabitants laboriously settled.

The manager of a cannery makes his contracts with fishermen before the season opens. With white fishermen it is a comparatively easy task, although it may be that some of the white fishermen do not decide to fish until the last moment. Contracts with Japanese fishermen are made through a "Boss Jap," who acts in the capacity of manager for the Japs and is their spokesman with the cannery manager. The cannery manager makes no individual deals with the Japs. He deals only with the 'Boss Jap.' This saves time and prevents complications. Similar contracts with Chinese fishermen or helpers are made through a "Boss

Chinaman.' Also the Indians are negotiated with in a similar manner as there is always a chief somewhere around when Indians go afishing. In the majority of instances the chief is boss and the Indians do his bidding.

A salmon cannery and its appendages are so arranged that the Japs live in a house or houses by themselves, known as the Jap house; the Chinks in the Chink house; the Indians in the Indian houses; the white men in separate houses. There is no commingling of the races. This makes for peace. The manager lives in a house by himself, generally a residence similar to those valued at from \$7,500 to \$8,500 in Vancouver. He is very comfortably found with all the conveniences of modern life, hot and cold water, electric light, open fireplace in the den and a furnace in the cellar. When his day's work is over, one finds him in a business suit, with white collar, smoking a cigar and reading the latest current literature, for all the world like a prosperous merchant of the city. And why not? He spends only three months of the year at the cannery. The rest of the year he is a citizen of Vancouver, as like any other citizen of that great city as two peas in a pod.

The manager of a salmon cannery must be a mighty fine specimen of mankind. Generally he has graduated from the ranks of the fishermen. He must know fishermen and fish. Particularly he must be versed in the peculiarities of the fishing grounds that are fished by his cannery. This knowledge is got only through experience. He is weighted with responsibility, for on his shoulders is the necessity of putting up an adequate pack of fish. If the fish are on the fishing grounds it is his task to see that the fishermen catch them and bring them to the cannery. Long before the first fish is caught his cannery has expended at least \$50,000 in getting ready. His job is to put up enough canned salmon to get back that \$50,000 and some more besides; the more the merrier.



WHEN one deals with two or three hundred fishermen and helpers and keeps them in order and up to the mark for fishing, he must be a man sure of himself and competent to command. The manager of a cannery is the absolute boss of everything in and around his cannery. He is a general and his army of workers are under martial law. What he says goes. Those who object to his rulings leave the cannery by the earliest boat. Should a fisherman land at the cannery with a flask of whiskey, and be seen with it by the manager, then that fisherman is off the list. He is ordered to turn in his boat and net and quit. The boot-legger is always on the go, so every boat that stops at the cannery wharf is scrutinized, and should the boot-legger land and ply his trade he gets short shrift. The Chinks are the prize boot-leggers. All Chinks look alike, and it is hard to pick out the stranger who carries the bottle. The fact necessitates overhauling the Chink house ever so often and breaking bottles, for the Chink does dearly love to drink booze, either case goods or his own make which is especially deadly.

The manager of a cannery must have a positive genius for organization. Not only has he to organize the perfect working of his factory, where cans are made and salmon canned, but also he has to organize the fishermen in their attacks upon the fish. To do this successfully he must see that they are properly equipped for fishing. The nets and the boats with their equipment, which the cannery supplies to the

fisherman, are in charge of the net boss, who is always a big strapping fellow who can put up an argument. Care must be taken that all equipment is in ship-shape when it is issued to the fishermen. If the net boss doesn't do this the fisherman will himself, for he does not want to reach the fishing grounds only to find a big hole in his net, which would mean that he could not catch as many fish as he should and, as he is paid according to his catch, it is in his interest to see that he makes a big catch. Through careful selection the manager can get a net boss who really helps the fishermen to catch fish. By keeping all equipment in shape the net boss can keep the fishermen fishing and not loafing on shore or mending his net on the fishing grounds.

Nets do get badly damaged during fishing operations. In rivers like the Fraser and the Skeena, swift running, snags are often encountered and a large part of the web of the net destroyed before the fisherman can get free. Dog fish also damage the nets. They bite their way through. Seals seize salmon gilled in the nets and in their struggles part the strands of the web. In Rivers Inlet last year a ground-shark got entangled in a net and carried away practically the whole web. It must be stated, too, that sea-lions, a few years ago, did damage to nets at Rivers Inlet and Barkley Sound, but since the method of scaring the sea-lions by firing off guns at the rookeries has been instituted no further damage to nets at these points has been reported. It is a strange phenomenon, but one often observed, that more damage is done to nets when the fish are not running than when they are going strong. A damaged net is often a good excuse for not getting the fish. A good net in these war times costs from \$170 to \$200, and hard twine has gone up in price, so it is a valuable piece of gear worthy of being taken care of by the fisherman in the interest of the cannery.

Then the manager of a cannery is also the manager of a little navigation company, whose fleet consists of two or more ocean-going cannery tenders, capable of facing any sea, and several launches. Success with cannery tenders and launches depends upon the manager engaging a competent skipper, preferably a Scotsman, for he is sure to be canny and able to see things and say nothing. If the manager is wise he will leave his Scotch skipper to choose his own engineers, and they will almost invariably be Scotsmen, for they are the only engineers in the canning industry. These cannery tenders tow the fishermen out to the fishing grounds on Sunday evenings and then anchor in convenient coves with their escort of scows to which the fishermen may bring their fish or in which they may place them when the tender makes a collecting tour. This is a clever scheme to keep the fishermen fishing and not wasting time by sailing home with his catch. It is a splendid example of efficiency in the salmon canning business, which has been defined as getting the other fellow to work for you. It was first thought of by a Scotch skipper. It is now in vogue wherever salmon is canned in British Columbia, for it saves time, and time is fish in the canning business.



FURTHERMORE, the manager of a cannery is also general manager of a small department store which caters to the multifarious needs and desires of a mixed population. Nothing but the best of everything is sold at a cannery store. The Japs, the Chinks, the Indian, and the white men, who work in and for canneries are well paid when the

fish run well and they spend their money freely. They have been educated by the big stores of Vancouver, Victoria and Prince Rupert, and they demand what they have been accustomed to. Only experience can tell the store-keeper what stock he will need, but that it will be large and high priced goes without saying. The Indians and the Orientals like bright colors, and the store-keeper keeps gaudy cloths. Every Indian who can afford it has a gramophone. Records of elevated cost find a ready sale over the counter of the cannery store. Red is the usual color worn about a cannery; it may be due to association with salmon. Patent medicines are plentiful in the store for every fisherman is his own doctor. Generally he wants something that will bite or taste bad. It is a primitive instinct, but not confined to fishermen. Last year the writer was in a cannery store at Rivers Inlet, and saw a big Swede fisherman come in and ask for Postum. That seemed strange and a far cry from Battle Creek, Mich., but the fisherman had been reading a magazine and wanted to try the effect of near coffee. The odd part of the matter is that the store could deliver the goods.

So far the environment of the salmon fisherman has been indicated. Now what about the fisherman himself? White men, Japs and Indians fish for salmon in British Columbia. All fishermen must be British subjects. Each fisherman must have a license. It is either attached to the canney for which he fishes or it is an independent license giving him the privilege of fishing for any cannery he wants to. To the Jap and the Indian the salmon season is the big event of the year. It provides him with means of earning enough money to keep him the rest of the year. It is affirmed—and there seems every reason to believe—that the Jap fisherman makes in a good year from \$1,000 to \$1,500, and this enables him to take a long trip home and return when the season opens up again. This applies only to the young bachelor Jap. Few Indians make as much money fishing as the Jap does, for the Indian is not a willing worker, seeming to think that too much money is an added worry to be avoided if possible. When the fishing season is over the Indian takes things easy till necessity, and the running of fish combine to set him to work again.

The white fisherman is in a different class from the Jap and the Indian. The best white fishermen are settlers who find in the fishing an opportunity of making a few extra dollars to keep them going until they have cleared their pre-emptions or freeholds and made them productive. For the most part they are farmers who have not been deterred by the formidable prospect from entering a wooded land, in the hope of some day seeing the land logged off and covered with growing grain. Scotchmen, Irishmen, Englishmen, Swedes, Norwegians, Russians and Canadians, all are represented in the ranks of the white fishermen. They come to the canneries from their settlement, 50, 100, 150 miles away, leaving their wives and young ones to tend to the farm while they toil over their nets to get the wherewithal to provide against the coming winter. They are the real Salmon Fishermen of British Columbia, and they are a stalwart breed, worthy of all praise and support.

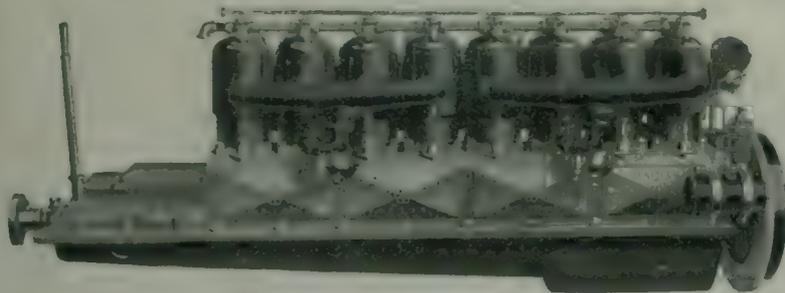
The best of them equal the Japs as fishermen, the worst surpass the Indians. The Jap has no pre-emption on which he has made a clearing and planted a kitchen garden. He has not ties he cannot break. The Indian is no farmer. He prefers to squat rather than

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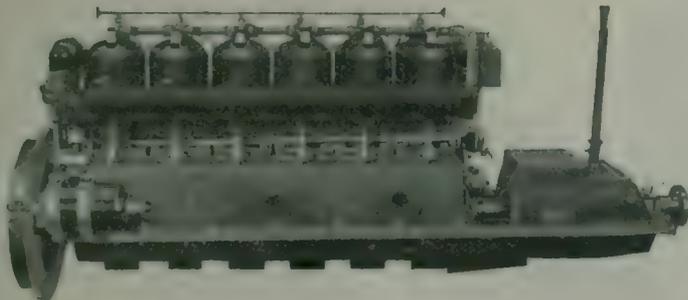


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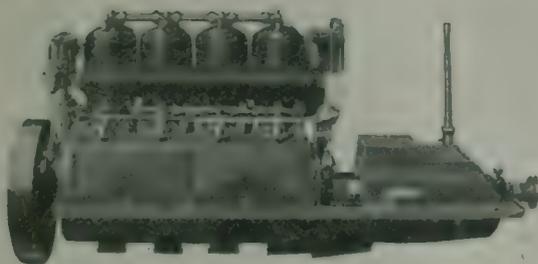
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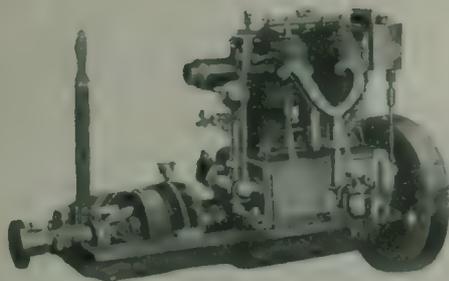
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to spade. But for the white fisherman there is always a light in the window of his shack on his pathetic clearing, while within sits his wife working and waiting for his return and his children listen for Daddy's boat to grate against the gravelly beach on his homecoming. Take off your hat to the white fisherman and settler, for it is he who is doing heroic things to cut out for himself and his own a bit of land on which, if God is kind, he may make a living and rear a family as sturdy, as self-reliant and as sincere as himself. These settlers have a veritable passion to own a strip of land and no obstacle, no matter how prodigious, crows them. This is the stuff from which an independent peasantry is moulded. May Heaven prosper their just and courageous endeavors.

One shock-headed, blue-eyed Scotch settler was encountered a year ago in the height of the fishing season, 250 miles up the coast. It was on a Sunday, a closed day to fishing. (It is a mystery who gave the fish their Sunday). He had just received a letter from



Dressing the Fish.

his wife who was left on the homestead with her two little children. That spring he had cleared half an acre and planted it to garden truck and to keep the deer out of it he had put up a clap-boarded fence. The letter said that the deer had come up to the garden, broken down the fence and eaten up everything green in sight. Not only that but his brother-in-law, who lived on the adjoining homestead, had tried to frighten the deer off and in doing so had shot away his left hand. That was a pretty kettle of fish for a fisherman to care for on a Sunday afternoon and his homestead was seventy miles away reached only by boat or air-ship. That Scotch settler fished through the season and made less than \$300. But he went back to his wife and family and his deer eaten garden. Better luck to him.

Another white fisherman and settler was seventy years of age and had been fishing every season for the past twenty years. He looked like Father Time as he stood up in his boat and pulled a sturdy oar. In his

time he must have been a skookum chap for his shoulders, though bent, wre broad and heavy. He had the face of a Patriarch, lined with care yet unafraid. His hair was long, unkempt and gray. He never talked to anyone. He had come to fish and he fished as if Destiny were at his back. The other day a friend from up there brought word that the old man would not fish this year. He had died on his clearing last winter. Not for him, dear old soul, the promised land.

The essential tools for the salmon fisherman are his boat and net. The boat is a strongly built round bottom sailing boat, 30 feet long, 6½ foot beam with a 6 foot centre-board. On either side of the centre-board are the fish tanks capable of holding two and a half tons of fish, live weight. The sails are a jib and an ordinary sloop rigged main sail. The net is 150 fathoms long with a width that varies with the depth of water on the fishing grounds. The mesh is 5¾ inches and this is the regulation standard through British Columbia.

Up to twenty years ago the salmon fisherman's boat was an ordinary skiff, and in some cases it is yet. That is twenty years after salmon canning began in British Columbia (in 1876), the salmon fishermen still used a two-oared skiff. But a score of years ago Gilbert Robertson, then owner of the Alliance Cannery on the Fraser River, built twenty round bottomed sail boats and used them with great success in his fishing operations. Following his lead, all salmon fishermen's boats became round-bottomed sail boats, with big sweeps as auxiliary power, when the wind fails, and so it is today.

Twenty-five years ago salmon nets on the Fraser River were made of soft twine. The same Gilbert Robertson, a Labradorean and a fisherman up and down the Atlantic for years, made with his own hand a salmon net of a hard laid sturgeon twine, oiled it and used it with exceptional success. The soft twine bunch and did not spread easily. The hard twine keeps its shape and place, and if properly oiled can be handled without danger of tangling up. That was the beginning of salmon nets made with hard twine, double knotted. After Robertson had demonstrated their utility the net stores stocked up with the new nets. All this must be true history, for Gilbert Robertson says so himself, and all who know him vouch for his veracity. Doubtless, however, there are old-timers with the gift of imagination and impressed for years with the strength of their own stories who will take issue with Gilbert Robertson. That will then be another story.

The salmon fisherman's boat is his house and home. On it he carries not only his net but all the paraphernalia he thinks to make a big catch and to give him comfort. He leaves the cannery before 6 o'clock on Sunday night and it is either towed to or sailes to the fishing grounds to that he may, as soon as the 6 o'clock gun is heard, drop his net and prepare to catch the fish as they make their way up the stream or inlet. He is going to fish till 6 o'clock Saturday morning. He knows he will need to eat, to keep warm and dry, to sleep, to read and possibly to pray. So he goes prepared.

On his boat is a week's supply of food and fresh water. He has a stove made out of a discarded oil can that burns gasolene. In one end he has rigged a wigwam into which he crawls when it rains or when he wants to sleep. He goes warmly clad but he keeps a change of dry garments on board. His long rubber boots and slicker, and a sou's wester are always at

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hand, for it rains frequently in certain parts of British Columbia. Many fishermen have dogs of strange breeds that go fishing with them and some even carry gramophones to lighten the tedious hours of waiting for the fish to get in the nets. Most fishermen smoke, those who don't "chaw terbacker". Some achieve the impossible by doing both at one and the same time. The younger fishermen carry safety razors and a looking glass but the oldtimers let their beards grow and look only for fish. Some fishermen have been known to take a daily dip in the river but most of them forego that exhilaration on the ground that their business is to fish not to frivel.

Salmon fishermen are gregarious and fish in couples, one pal keeping near the other to lend him a hand if needs be or for companion ship. In fair weather—except for the cramped quarters—the fisherman has a fairly pleasant time, that would be enjoyed by a husky city man. In bad weather, however, with the rain falling in cataracts, the water rough, the wind blowing and the night dark, it is no fun and even the stoutest fisherman gets his net aboard and beats it for the nearest shelter till better weather ensues.

The method of fishing with a gill net is simple, though to succeed at it requires strength and endurance. The fisherman having chosen his ground, pays out one end of his net which is anchored to a small cask on which in the daytime is placed a red flag and at night a small lantern. He rows away from the paid out end, paying out a little net as he goes till the whole is in the water. He then ties the other end to another cask and flags it. Then the net is out and from flag to flag is seen a row of floats three feet apart on the surface of the water the whole length of the net. The fisherman takes up a position in his boat away from the net but near enough to watch it closely. When the fish are on the net the small floats go under water and other signs are made near the net to indicate that the salmon have been gilled. If only a few floats sink under a few inches the fisherman rows to the agitated part of the net and lifting it takes out the fish and puts them in his boat. If a great part of the net is struck by the fish then the fisherman pulls it in, taking off the fish as they come with the net to the side of the boat. When the fish are gilled in a net they are securely caught for they have run their noses through the meshes which are too small to admit their whole bodies. When they try to back up they are caught in the gills which for respiratory purposes are never still on a fish. Seldom does anyone fisherman get a boat load of fish at a cast. If he catches one hundred fish a day he is doing well for a catch of 3,000 fish per boat in the Sockeye Season of six weeks means money for the fisherman and happiness to the canner. Prices vary for the fish the fisherman catches. On the Fraser as high as 50c a fish has been paid though it is expected that 40c a fish will be the high price this year. In the northern waters a slightly less price is paid per fish. The price depends upon the supply of and the demand for fish as well as the scarcity or plentitude of labor. The fishermen generally meet and agree on a price to ask the cannery before the season begins, though it often happens that when the season is on and the need of fish imperative, competition among the cannery raises the price to the immediate advantage of the fishermen. If the fisherman catches the fish he can make excellent wages, but in this, as ever, luck plays a predominant part.

When 6 o'clock Saturday morning comes around the

fisherman turns his boat toward the cannery and calls it a full day.

Arrived at the cannery he ties up his boat, takes out his net and puts it in a bluestone tank, and gets ready to spend a few hours on shore, fraternizing with his fellows and stocking up for the next week's work. Saturday and Sunday afternoon finds him mending his net and putting things into ship-shape for another try at the fish. And so it goes on until the end of the season.

Such is the life of the salmon fisherman in the Northern waters of British Columbia. It is somewhat different on the Fraser River and in the Gulf of Georgia where gasolene boats are used in fishing. The same sort of net is used, but there are generally two men on each boat and fishing operations are interesting. In all British Columbia waters the independent fisherman, the fisherman not attached to a cannery but free to sell to them when he wishes, uses his own discretion as to fishing hours. When he thinks he has fished long enough he quits. With the attached fisherman, however, the cannery manager indicates the length of the fishing trip, except in exceptional cases where tried and proven fishermen are allowed to do as they please, with good results.

All in all the salmon fisherman in British Columbia has no reason to complain, unless it is that the salmon are not as plentiful as they should be. That is true of the spring salmon in all British Columbia waters. It is also true of the sockeye salmon in the Fraser River. Hence with more fishermen fishing and fewer fish running it is inevitable that not all the fishermen can make big catches and make much money. But as fishing is only an aid to a livelihood for the majority of white fishermen, who find remunerative occupations during the rest of the year, it partakes of the nature of a vacation which is spent in the open air, on the sea, the river or the stream and doubtless prolongs the lives of many of its devotees. Three years ago a gentleman with an income in the five figures, spent a Summer at Noden Harbor fishing spring salmon and put in his catch and got his money from the cannery as did the Haida Indians, yet he said he was fully compensated by the sport itself.

The salmon fishermen of British Columbia are members of an honest calling, for ages recognized as a dignified manner of earning a living, and their labors help to keep them physically fit to assume all responsibilities as citizens of the British Empire.

W. H. GREENWOOD.

SALMON SAUSAGE NEW FORM OF FOOD.

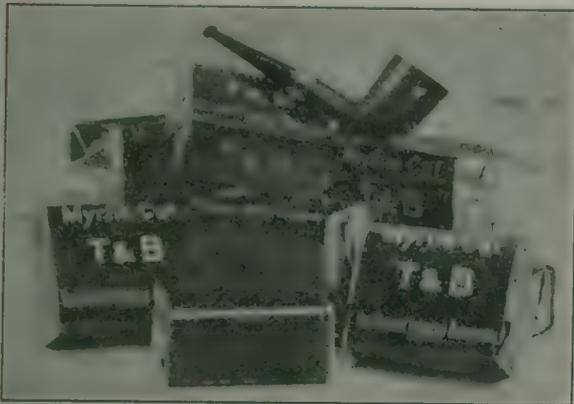
Company Organized to Place it on the Market—Other New Incorporations.

Victoria, B.C.

Salmon sausage will be a new form of food to be shortly placed upon the market by the Fraser River Salmon Sausage Manufacturing Co., Ltd., a concern, notice of the incorporation of which is given in the current issue of the British Columbia Gazette. The head office will be at Vancouver. The Company will also manufacture fish oil and carry on the business of fish curing. Its capital is \$10,000.

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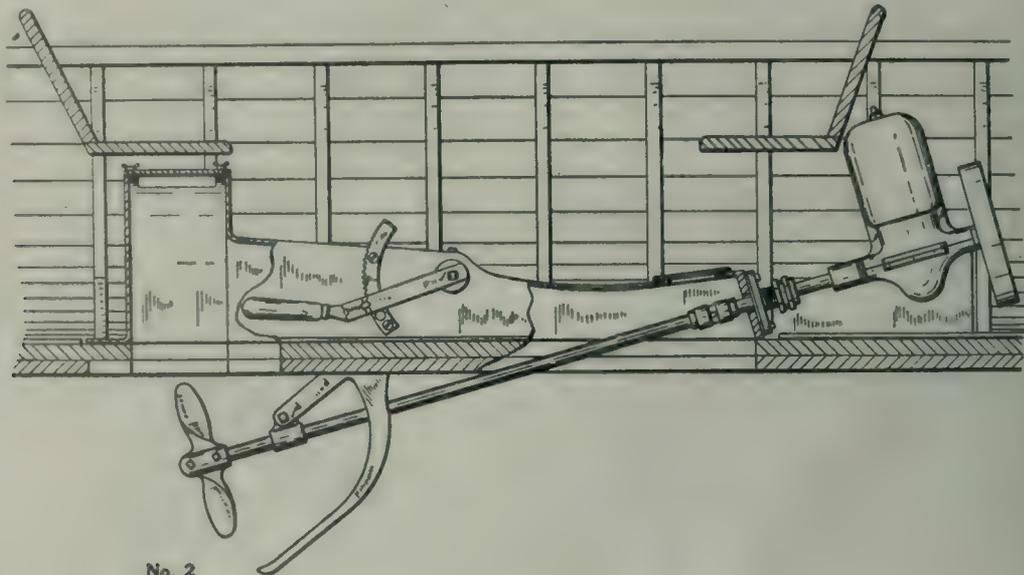
The Tuckett Tobacco Company, Limited, Hamilton, Ont.

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rocks or sand bars, being furnished with a weg, which automatically raises the propeller and shaft into a housing above the keel, on striking an obstruction. The skag, when raised, forms a continuation of the keelson, and, at the same time, throttles the engine from racing. A handy lever in the flooring gives a complete control over the speed of the boat, without touching the engine, and also enables the propeller to be raised with its housing when desired. The change from row-boat to motor-boat can be made without leaving one's seat. The engine is a Waterman make. The company will be glad to send illustrated literature to anyone upon request.



No. 2

A STENCILING MACHINE FOR FISHERMEN.

The readers of the Canadian Fisherman are practically all shippers of boxes, bales or packages, and will be interested in the announcement of the Hamilton Stamp and Stencil Works Limited, Hamilton, Ontario, in another column, illustrating their Bradley Stencil Machine. A machine of this nature, in the hands of our fishing firms, will mark the smallest package to the largest box, bale or tin with equal legibility, and mark them uniformly, thus preventing goods going astray, and presents a much more businesslike appearance than the old-time hand marking. Any kind of stencil can be cut with it in a minute or two, and the makers claim it will save its price the first year in the cost of metal stencil alone, besides being a great labor saver, particularly now, when labor is so scarce. It can also be used for advertising purposes for show cards, posters, etc. The company will be glad to send illustrated literature to anyone upon request.

FISHING NOTES.

Mr. A. L. Hager, manager of the Canadian Fishing Company, Limited, and New England Fish Company, left Vancouver on June 1st for an extended visit to Eastern Canadian and United States points. Mr. Hager spent considerable time in Boston taking up with his directors various contemplated extensions of his companies' activities.

Peter Buchan, well known to the fish trade in Vancouver and Prince Rupert, met with a nasty accident

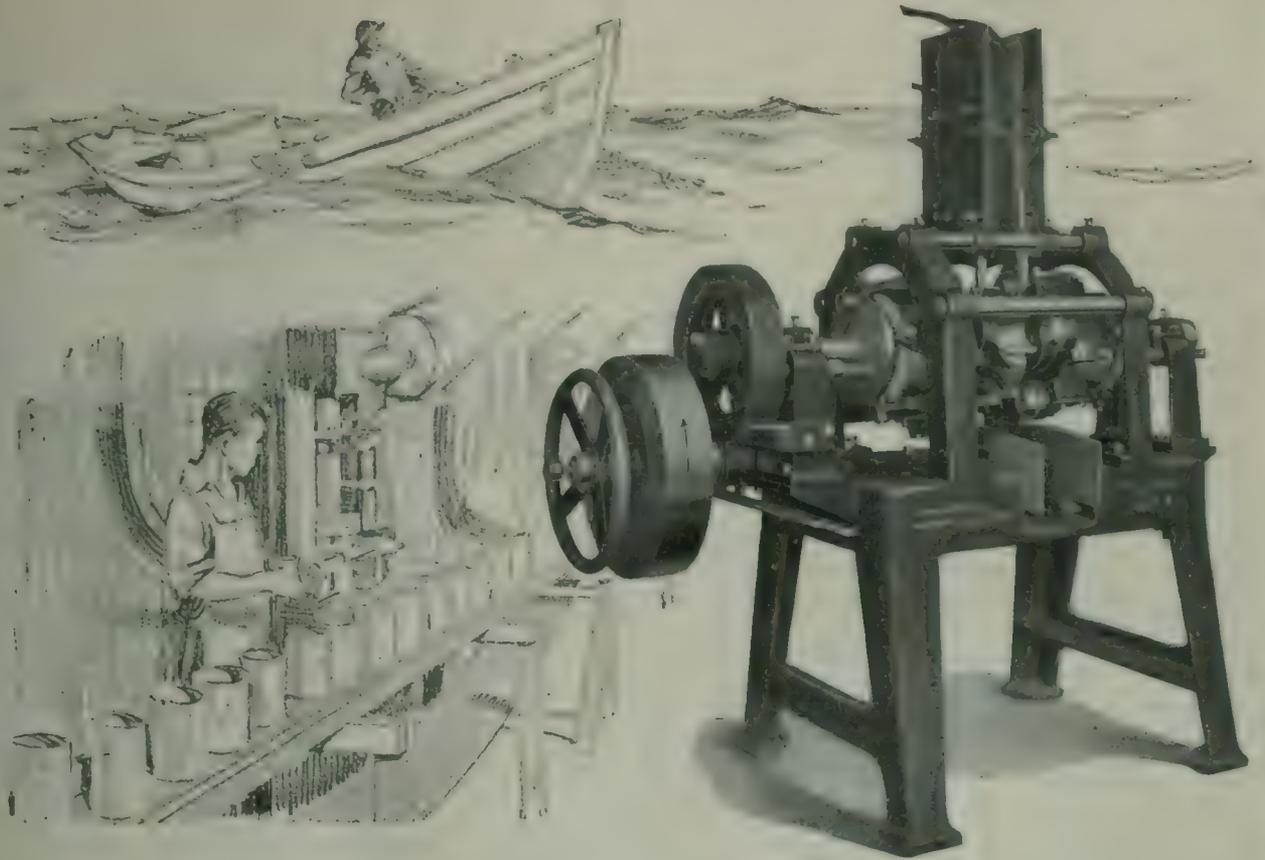
at Prince Rupert some time ago. While working at one of the fish sheds in connection with unloading a boat he got his foot crushed in an ice crusher and badly mauled about. After being in the hospital some time, he was able to return to his home in Vancouver, and is progressing favorably.

Mr. Harry Lipsett, manager of Lipsett, Cunningham & Company of Prince Rupert, spent a few weeks in Vancouver during the past month, on account of his health.

The casualty lists recently received from England announce the death of Private Harry Parker, formerly in the employ of the New England Fish Company at Vancouver. Parker was one of the many employees of the New England Fish Company who joined the Canadian expeditionary forces as soon as the war broke out, and is the first one reported as having been killed. Another employee, James Coombs, has recently been reported as being seriously wounded.

The Canadian Fish & Cold Storage Company, Limited, of Prince Rupert are continuing their trawling venture with the steamer "James Carruthers" with varying success. The steamer has encountered considerable bad weather which has had a adverse influence upon her operations, but outside of this she has been procuring considerable quantities of fish. Her trip landed in the middle of June amounted to about 160,000 pounds of fish.

The steamer "New England" sailed from Seattle for the fishing banks via Ketchikan, on the 17th of June.



Modern Cannery Practice

Allows little time to elapse between the catch and the final operations on the pack. Prompt and continuous streams of all the elements necessary to make cans are depended upon to avert loss.

Clean cut, high quality output is required of all "Bliss" Automatic Can Making Machinery, but steadily continued production at high speed is likewise a feature of importance. These things have been developed in The "Bliss" lines through nearly sixty years of experience and co-operation with canners and can makers in all parts of the world.

"BLISS" AUTOMATIC ROUND-CAN DOUBLE-END FLANGER, NO. 15-K.
 This machine flanges both ends of can bodies simultaneously and is entirely automatic and continuous in operation. It produces flanges on 100 to 150 cans per minute and can be readily adjusted from one size to another.

Write us for Catalogue Section No. 18-A



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1857

1917

LONDON, S.E., ENGLAND, Pooock Street, Blackfriars Road PARIS, FRANCE, 100 Boulevard Victor-Hugo St. Oue

under the command of Capt. Otto Holmstrom. This steamer, during the past four months, has undergone a thorough overhaul at Vancouver, B.C. Her coal bunkers were removed and replaced with oil tanks, and an oil burning system installed. Heretofore the operations of this vessel were handicapped because she could not carry sufficient coal to enable her to go to the Yakutat and Portlock Banks and return. As an oil burner her radius of operation will be equal to that of any other steamer in the halibut business. Her machinery also received a thorough overhaul. Another improvement which was carried out was the removal of the galley from the fore-castle to the after cabin. Formerly the galley was in the fore-castle which it shared with the fishermen's sleeping quarters. The fishermen, firemen and deckhands now all sleep forward, and the after cabin is divided between the officers' staterooms and the galley. Everyone who has inspected the new arrangement states that this vessel now has more convenient and commodious quarters than any other steamer. Her old fish hold was also torn out and entirely rebuilt.

A new record in large sized halibut has been set up, but unfortunately for the Pacific Coast, the honor goes to the East. The Echooner "Eva Avina" while fishing on the Middle Bank, South East of Cape Canso, on June 11th, caught a halibut which measured 9-ft. 8-in. in length, 4-ft. from the tip of the tail fin to the tip of the back fin and 16-in. through the thickest part of the belly. This fish weighed 625 pounds after the entrails had been removed, but with the head on. This is the largest halibut that has ever been landed at the Boston Fish Pier. Some very large halibut have been landed on the Pacific Coast in years past. Capt. Gott of the Steamer "Manhattan", in 1911, landed a halibut which weighed 387 pounds dressed with the head on.

Capt. Peter Keough of the Steamer "Starr" spent a few hours in Vancouver while his ship was undergoing a few repairs in Seattle.

MANITOBA NOTES.

(Special Correspondence).

One of the best known Norsemen of the province passed away May 16, in the Winnipeg General Hospital. Captain Stephen Sigurdsson, a real pioneer of the fishing industry on Lake Winnipeg. "Steve," as he was familiarly known to all who knew him, in the fish business and out of it, was admitted to the hospital suffering from hemorrhage (?) of the brain. Even the strong vitality of this big man was unable to stay the hand of death. The industry mourns the loss of one whose activity on Lake Winnipeg has covered a period of over forty years, during which time he had watched the development of the local fisheries, and likewise took a live interest in the expansion of the business.

He was born in Iceland in 1863 and settled on the shores of Lake Winnipig in 1876, and the passing years witnessed his constant effort in marketing the products of his favorite lake. During his career he owned the SS. Lady of the Lake, also the SS. Mikado. He leaves a widow.

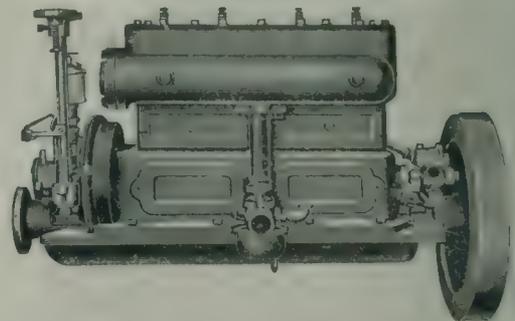
A. L. Hager, of the Canadian Fishing Co. Ltd., Vancouver, spent a day in Winnipeg recently en route to Toronto, Montreal and Eastern Points.

A new tug has been added to Lake Winnipeg fishing fleet and in honor of the pioneer fish man of the Prov-

ince it has named the W. J. Guest. — Here's, Good luck to the W. J.

The Industrial Bureau of Winnipeg are now interesting themselves in the propaganda to interest the residents of this community in popularizing fish as a food. A research committee to follow out this idea has been appointed. The chairman of this sub-committee is Mr. J. B. Hugg, who acted as one of the Commissioners appointed by the Dominion Government some years ago to investigate the fishing industry and its problems in Manitoba. One of the main objects of the committee will be to interest the citizens of Winnipeg and Manitoba to a more extended use of fish, particularly the fish produced in the local waters of the province. This is a move in the right direction, and the Fisheries Association will doubtless welcome the interest which is thus indicated by one of the most influential public bodies in Western Canada. Whilst the Lakes of Manitoba produce the finest whitefish in the world yet our own Canadian people are not as a whole a fish-eating class. The tastes of the individual are indeed strange and we find it a hard task to educate the people to a fuller use of fresh lake fish in preference to canned goods. Not that we wish to belittle canned fish at all, as there is a large place in the public mind for that class of our industry — only — we

It is an undisputed fact that thousands upon thousands of pounds of lake fish, of all varieties are exported annually, and the quality and flavor of the renowned "Seikirk" whitefish has been firmly established in all the largest centres over the international border. Our lakes are turning with other varieties of the finny tribes less known than whitepots, and there



ENGINES

2 CYCLE --- 4 CYCLE

3 to 50 H. P., 1 to 4 Cylinder

Send for catalog and second-hand list of bargains.

CHANGE ISLAND, Newfoundland.

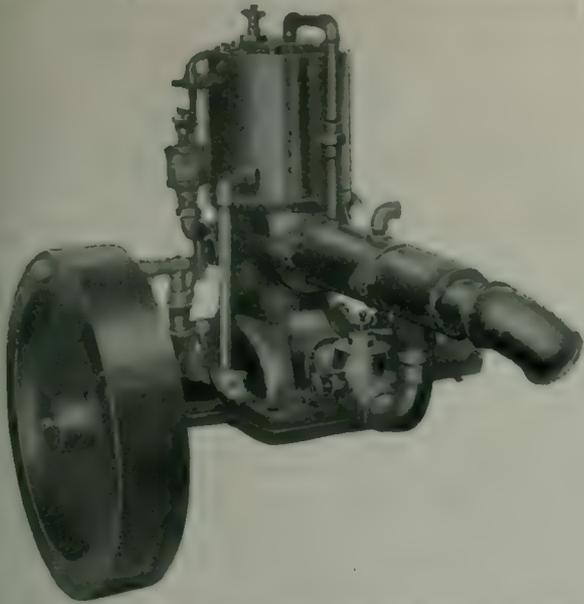
There is no other make of engine (and there are many) around here but what have doubled the Guarantee in running expenses this year. The two-cycle men are trying to burn kero, but are having a lot of trouble. The Guarantee four-cycle engine will run a whole fishing season on the lowest grade of kero without cleaning. We did not so much as take out a spark plug to clean it this summer. Fishermen should buy four cycle engines for two reasons. First, because the running expenses are little more than half of the two cycle. Secondly, because it is much less trouble to keep them in working order. This is how I have found it after three years of experience and a thorough knowledge of the running expenses of both.

Arch. Scammell.

SEND FOR CATALOG

GUARANTEE MOTOR CO.
HAMILTON, CANADA

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A few new 6 to 7 h.p. slow speed Marine Engines, made by the Canada Gas Power Launces, suitable for small fishing boats. These are the last remaining of a bankrupt stock, and are offered at low prices for quick turnover. Large stock of repair parts always available.

Don't miss this opportunity to secure a high grade engine at a Bargain Price.

Write Marine Sales Dept. to-day.

The A. R. Williams Machinery Co., Limited
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Columbian
ROW BOAT MOTOR

Saves Time and Labor

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With the aid of this highly efficient motor, Fishermen not only save themselves much heavy toil, but are able to go farther in less time, and so increase their fares to a large extent.

We can supply complete equipments of two and four cycle marine engines up to 20 H.P.

Tell us your needs to-day, and we will be pleased to send you a catalogue. Address:—

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112 W. Lake St., CHICAGO, ILL.

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10 Sizes---14 Numbers

A Soldier's wind is a fair wind, but any wind's a fair wind that blows you aboard of a craft with a SHIPMATE in her galley. North-wester or South-easter, the SHIPMATE'S below, doing its duty,

Always Reliable -- Fair Weather or Foul

Made by

The

**Stamford Foundry
Company**

STAMFORD

CONN.

Established 1830

is abundance of fish in many of the inland seas as yet untouched.

Why is it that lake fish finds greater favor in Buffalo, Detroit, Chicago and other United States cities than in Montreal and other Canadian cities of the east?

If fish from the Pacific ocean can be safely transported across the entire continent and landed in Boston in a first class condition, there should be no reason in the wide world why lake products cannot be likewise transported, but the demand does not exist for such a quantity of lake fish in one centre, at one time, during the summer months.

One factor will considerably help the development of the fabric demand for lake fish, i.e., the entire cancellation of all subsidies granted by the Dominion Government for Pacific and Atlantic fish. The existence of these subsidies whilst fostering and extending the demand for sea fish in inland communities discriminates considerably against locally produced fish—How is this?—well, fish from the Pacific points into all Manitoba towns have the advantage of the one-third subsidy off the usual express tariff, whilst the fish caught right at home in this province must stand the full local express rate and consequently the Pacific fish has in the past cost less than what local fish would cost laid down in many western towns.

The fishing industry of Lake Superior, all along the North Shore, also the Manitoba interests could find a greater opportunity for developing the home caught article of the subsidy was cancelled altogether.

It is unjust that any specific branch of the industry should have an unfair advantage over another section, especially when such advantage is Government—given and in the end works to the disadvantage of the district which derives no subsidiary assistance.

But enough of this for the present issue. Your correspondent may refer again to this subject later on.

Messrs. W. Sanford Evans of Ottawa, and F. T. James of Toronto, members of the Dominion Commission to investigate the salmon industry of British Columbia, accompanied by Mr. W. F. Found, superintendent of the Fisheries Department, spent a day in Winnipeg en route to the Pacific coast, where their labors as a commission will shortly commence.

The fishing on Lake Winnipeg whilst delayed for about ten days at the beginning of the season on account of ice, is fully better to date than last year during the same period. Weather conditions have been excellent and a full pack is expected. The quality of the fish is the finest and the demand good. The usual run of catfish has failed entirely and the only explanation offered is, the water has been too cold and conditions generally against the cat. However, whilst it is late to expect any cats, this may be but a strange act of nature and we may have them in shoals later on.

The Dominion Government have made some changes in the regulations and restrictions on Lake Winnipeg, and the full text of the alterations are expected from the department shortly.

ENGINE BARGAINS

50 engines 3 to 45 H.P., 2 and 4 cycle, 3 H.P. Ferro, \$60; 5 H.P. Adams, \$80; 6 H.P. 2 cyl. Guarantee, \$115; 10 H.P. Gray, \$110; Row boat motor, \$55; 7 H.P. Racine, \$100; 8 H.P. Buffalo, \$175, and many others, also propellers, rings and all supplies. Send for list.

GUARANTEE MOTOR CO.

HAMILTON - CANADA

P. A. Bensley.

THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV MONTREAL, AUGUST, 1917 No. 8

Lion Brand Cordage

Is quickly available in any part of Canada

No matter what part of Canada you are located in, Lion Brand Service is always at your disposal. By means of our system of distributing agencies extending from Coast to Coast, we can supply your wants at shortest notice.

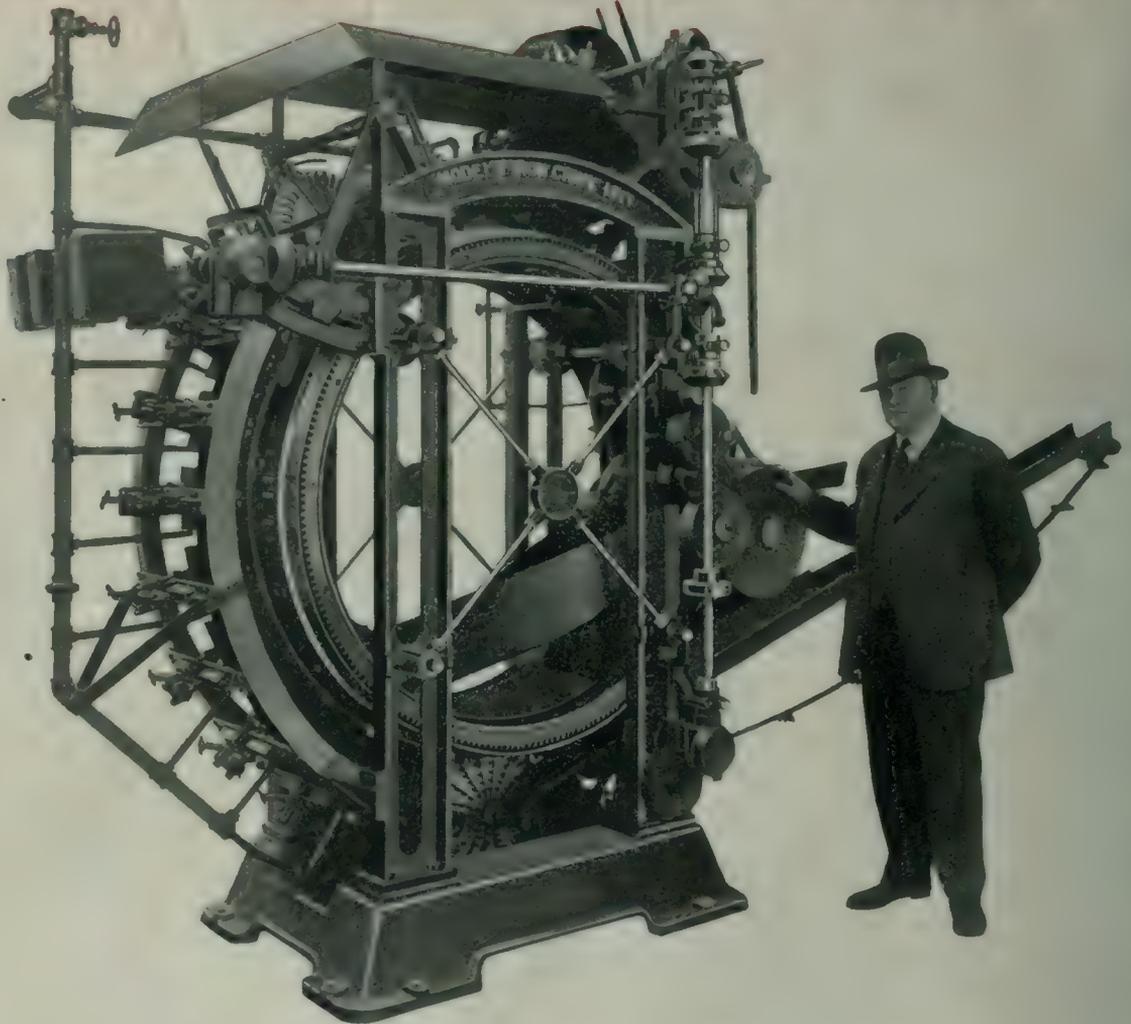
Consumers Cordage Company, Limited

Mills at Dartmouth, N.S., and Montreal Branches at Toronto and St. John N.B.

Buy Lion Brand because it's Made in Canada and because it is the Best

PACIFIC FISHERIES SECTION.

The New "Iron Chink"



A COMBINED BUTCHERING, CLEANING AND SLIMING MACHINE. THE ONLY MACHINE OF ITS KIND ON THE MARKET.

For the past fifteen years we have been manufacturing Butchering and Cleaning Machines for use in the salmon industry.

These machines have proven themselves great labor and fish savers and a packing plant is not considered complete without one.

The above illustration shows our latest improved model—one that is far superior to any we have heretofore manufactured.

We are now taking orders for 1918 delivery. Full information, prices, terms, etc., furnished on application.

Smith Cannery Machines Company

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THE CANADIAN FISHERMAN

A MONTHLY JOURNAL DEVOTED
TO THE COMMERCIAL FISHERIES
OF CANADA AND NEWFOUNDLAND
THE SCIENCE OF THE FISH CULTURE
AND THE USE AND VALUE
- OF FISH PRODUCTS -

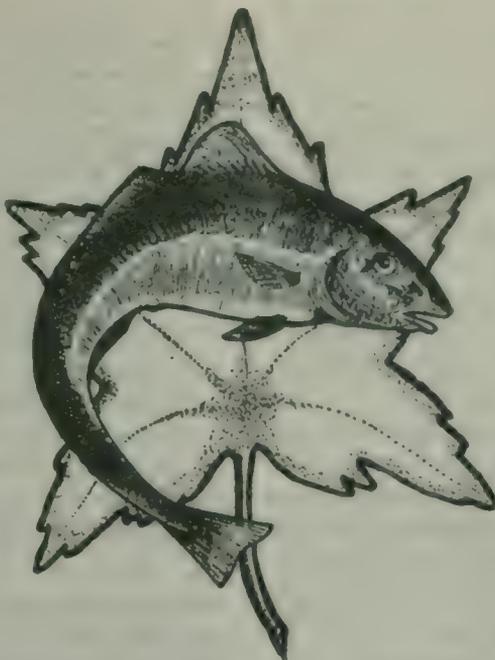
F. WILLIAM WALLACE
EDITOR

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Published on the 24th day of each month. Changes of advertisements should be in the publisher's hands ten days before that date. Cuts should be sent by mail, not by express. Readers are cordially invited to send to the Editor items of Fishery news, also articles on subjects of practical interest. If suitable for publication these will be paid for at our regular rates.

Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, AUGUST, 1917

No. 8

The Case of the Producer

With a critical inquisitiveness calculated to arouse troublesome suspicion, a prominent Toronto daily, in its issue of August 7th, comments upon the first ear of fresh fish which the Food Controller of Canada brought from the Atlantic seaboard and distributed to the consumers of that city at prices lower than what the people of Toronto heretofore had been paying for a poorer quality of the same article. In doing this the Food Controller disturbed neither the ordinary machinery of the fish trade nor asked the producer to accept a price one iota less than he had been receiving, which, by the way, as a result of the excellent foreign demand, has been considerably higher during the last year than he received for many years previous. This does not imply that the price paid was too high, because, when the fisherman's market depended upon Canadian consumption he received a price for the products of his labor insufficient to pay for equipment and provide a living, and the number engaged in the business of fishing decreased from 82,871 in 1905 to 65,081 in 1913. During the same period the boats engaged decreased from 41,463 to 34,501. Even present prices do not leave sufficient if any margin, and, unless the Food Controller effects a considerable reduction in the prices of the articles

the fisherman has to buy, a much higher price will have to be paid for his fish, if the supply of this commodity is to be maintained. This matter has been brought to the attention of the Controller and assurance received that it will be attended to.

But the point we wish to impress upon the Toronto daily press is that the improvement the Controller effected in the fish services of the consumer has been brought about by increasing the demand and improving transportation facilities, and not by forcing the producer to receive a lower price for his product or by interfering with the price he was receiving for his exports.

How different is this from the methods by which the metropolitan press of Canada, including the above mentioned Toronto paper, prevailed upon the Dominion Government to force down the price of newsprint. They struck directly at the producer.

The forests of Canada annually produce about 660,000 tons of newsprint, over 600,000 tons of which, as well as 560,000 tons of pulp, and 1,100,000 cords of pulpwood, is sold in foreign markets, principally in the United States, and in this way helps to pay the interest on Canada's foreign borrowings and reduce her adverse balance of trade. At the instigation of the

metropolitan press of this country, which consumes only 60,000 tons of newsprint, the Canadian Government has forced down the prices of this commodity to a ridiculous level and thereby protected the Canadian daily press from an expenditure of a couple of million dollars, and at the same time reduced the value of the country's exports of pulpwood, pulp and newsprint by at least 20 million, all of which come out of the pockets of the producers of these commodities—every man who had a stick of pulpwood for sale contributing his share.

This action of the metropolitan press and the Government has so reduced the profits of the newsprint producers that most of their projected improvement and expansion had to be cancelled and their position thereby weakened when they come into competition with foreign countries after the war.

Another instance of where the Canadian producer paid the piper is that of cheese. By the fixing of the price of this commodity, the Canadian producer has lost several million and the value of the country's exports has suffered a reduction of the same amount.

It is significant that while the price of cheese to the Canadian producers has been regulated, no attempt has been made to adjust the price the Canadian consumer has to pay for his cheese, nor to reduce the prices paid for the articles used in the production of cheese. It is unfair to regulate the prices producers receive without at the same time regulating the price of the articles used in production. It is also unfair to permit, much less to assist in a course calculated to reduce the value of the country's exports without receiving some quid pro quo in the way of a reduction in the commodities Canada has to import.

Canada imports large quantities of anthracite coal, a commodity which figures largely in the cost of living of most Canadian producers. At the present time the price of anthracite coal is unreasonably high, due to two causes, namely the price which producers of anthracite coal in the United States are asking and the excessive profit exacted by the importing companies. Yet the Canadian Fuel Controller acknowledged, in a meeting at the Montreal Board of Trade a few days ago, that no effort had been made to effect a lower price at the point of production and that it was not his intention nor the wish of the Dominion Government to interfere with the coal trade. The controller of prices in the United States has not hesitated to ask for the assistance and co-operation of the Canadian authorities in the regulation of prices which Canadian producers are charging American buyers, and why should there not be reciprocal action. The Federal Trade Commissioners, who investigated the newsprint situation in the United States, did not hesitate to send their auditor to Canada for the purpose of examining the books of Canadian Paper Mills. Furthermore, at the instigation of the sardine factories of Maine, the Food Controller of the United States did

not hesitate to ask the Food Controller of Canada to investigate and see if the fishermen of New Brunswick should not be forced to accept a lower price for the fish they sold to these factories.

The controllers of prices in Great Britain, United States and Canada must necessarily work together if the best results are to be obtained. But, heretofore, any such international effort has resulted to the disadvantage of the Canadian producer. The Canadian producer of cheese receives a fixed price for his product in order to keep down the price of this commodity to the British consumer, and the Canadian producers of newsprint is forced to accept the minimum price for his product in order to supply the metropolitan press of the United States and Canada with cheap paper. But we do not know of any article, the price of which has been regulated with advantage to the producers of cheese or newsprint, and it is decidedly unfair to force a producer to accept a lower price for his products without first reducing the price of the articles that enter into the cost of his production. Neither do we know of any article, the price of which has been regulated with advantage to the international trade of Canada. Canada pays the interest on her foreign borrowing, her anthracite coal bill and her bills for imports with her exports of newsprint, pulp, pulpwood, fish, wheat and other commodities the products of her natural resources; and the higher the prices her people have to pay for these imports and the lower the prices her people are compelled to accept for the things they have for export, the greater will be the adverse balance of trade of this country.

SMART SCIENTIST.

The scientist had given a very scientific lecture, and at the end he said, beaming down on his audience condescendingly:

"Now, if there is any scientific question that any of my friends would like to ask, I beg them not to hesitate. I shall be only too happy to answer any inquiry in my power."

An old lady in spectacles that gave her a severe, stern look, rose and said:

"Why do wet tea leaves kill cockroaches?"

The scientist did not know wet tea leaves did anything of the kind, much less the cause of the phenomenon: but, never at a loss, he replied:

"Because, madam, when a cockroach comes across a wet tea leaf, he says: 'Halloa, here's a blanket, and wraps himself up in it, catches cold, and dies.'—Tit-Bits.

MAJOR H. GREENE MARRIED.

LONDON, July 26.

Major Hughie Green, Canadian quartermaster-general's staff, familiarly known as "the Fishmonger General," through superintending Canadian fish rations, was married to-day to Violet Elenore Price, well-known as a vocalist. Lieut.-Col. Charles McLean, of Montreal, was best man.

Canada's Fisheries as a Source of Food Supply

J. STAFFORD, M.A., Ph.D.

At the present time it is more than ever necessary to take stock of our national resources, whether natural or artificial. The colossal struggle that was precipitated in central Europe and has spread to the inclusion of major parts of every continent, is a contest not simply between the man-power of the opposing nations, but is a trial of strength in a more comprehensive sense. Beside the immense numbers of men and their high standard of quality, there is the backing which calls into support every resource of the countries concerned—the natural and the artificially acquired wealth, the morals, sense of duty, judgment, invention and skill of the people.

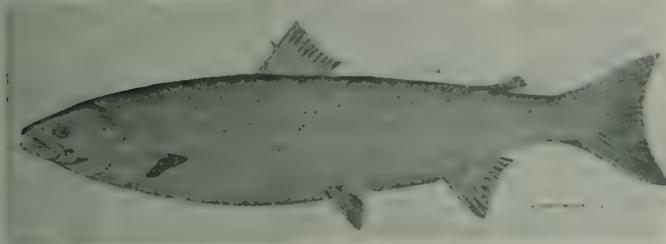
Our original natural resources may be pretty well comprehended in the three divisions—

Forests,

Fisheries, game and fur animals,

Mines and water power,

to which may be added the artificial resources —
Agriculture and manufactures.



The Atlantic Salmon (*Salmo salar*) as a type of the Vertebrata (and the Fishes).

Re-arranged these may be classified and exemplified under:

Plants—

Vegetables, fruits,
Wood, timber, lumber,
Buildings, ships, furniture, implements,
Hemp, linen, paper, oil, tar, etc.

Animals—

Fish, game and fur animals,
Domesticated animals that form our companions,
carry our burdens, and furnish food and clothing,
Cured meats—dried, smoked, pickled, canned,
cooked,
Feathers, wool, cotton, leather, oil, glue, dyes, etc.

Minerals—

Metals, ores, chemicals,
Water, coal, oil, salts,
Power.

Culture—

Agriculture, vegetables, grains, fruits, wood, bark,
hemp,
Fish-culture, poultry, live-stock

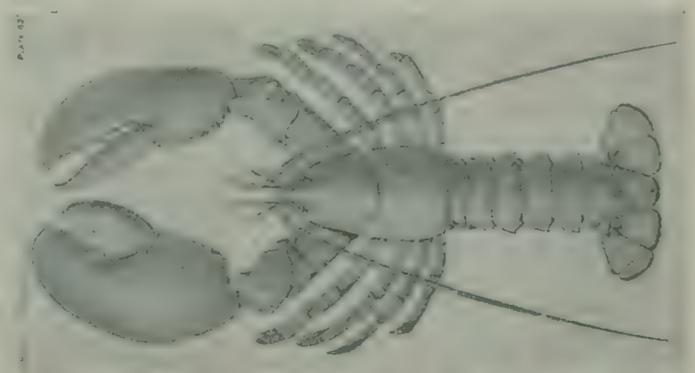
Manufactures—

That subdivision of our natural resources selected as of especial value in the present connection is the fisheries, types of which may be kept in mind as the

Salmon fishery
Lobster "
Oyster "
Whale "

It is, of course, plain to everybody that, for want of a more technical knowledge, the masses of our people speak of many animals as fish that are not fish in the true sense of the word. In this latter sense the last three of the above four types would be ruled out. It does not need years of experience in the fishing profession to recognize that a salmon, a lobster, and an oyster are distinctly different types of animals, notwithstanding that they may be caught in the same bay and by somewhat similar methods. This becomes increasingly evident if we introduce another animal, such as a cod, into the comparison. All would agree that the cod must be classed with the salmon and not with the lobster or the oyster. The salmon and the cod are fishes, the lobster and the oyster and the whale are not fishes at all, but animals so different from fishes that it is confusing to speak of them under the same name. It adds immensely to the accuracy of conversation and reasoning to be able to speak of each distinct animal or each distinct class by a distinct name; and fishermen, merchants or others should not object to making use of this advantage. Another confusing custom is the grouping of lobsters and oysters together under the term shell-fish, when they are not only not fish, but the vast difference in their organization, even in their shells, does not warrant their being called by the same class-name.

If a number of children are ushered into a large furniture store, they will all agree in classifying the furniture into chairs, tables, sofas, beds, etc., according to the construction of the articles. In the same way, those who have made themselves familiar with great numbers of animals have learned to classify them according to their structure. The salmon, the lobster, and the oyster (see cuts) may be taken as types of three great groups of animals, of which the members



The Lobster (*Homarus americanus*) as a type of the Arthropoda (and the Crustacea).

of each group are as much alike as are the different makes of chairs and as much different from each member of the other two groups as a chair is from a table. These three great groups of animals are called sub-kingdoms of the animal kingdom and are named—

Vertebrata (ver-te-bra-ta).

Arthropoda (ar-throp-od-a).

Molluska (mol-lusk-a).

Nearly all animals that have been found useful to man, and all that have been found most useful, belong to one or other of these three sub-kingdoms. In fact

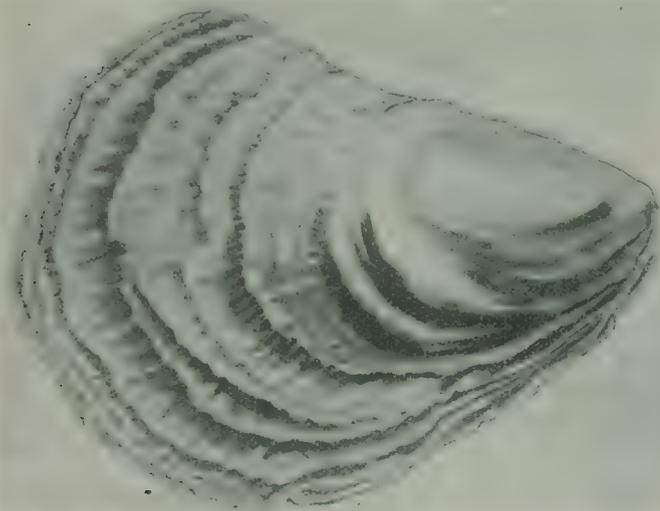
man himself is a member of the Vertebrata.

The Vertebrata are all those animals that possess a vertebral column or backbone composed of separable pieces (vertebrae) jointed together. The group contains five subdivisions or classes:

- Fishes (salmon).
- Amphibians (frog).
- Reptiles (turtle).
- Birds (duck).
- Mammals (cow, whale).

The fishes are very valuable for food; the amphibians and reptiles are of relatively small value; the birds are of value for food and feathers; the mammals for food, clothing, and beasts of burden. Birds and mammals are represented by numerous wild species (game animals) and also by many domestic species (poultry and farm-stock).

Fishes, so far as is known, are all good to eat, i.e., are not poisonous. It is hardly necessary to say that some are better than others. And this is true not only from the standpoint of taste or flavour but also as



The Oyster (*Ostrea virginiana*) as a type of the Mollusca (and the Bivalves).

regards nutrition and the amount of meat in proportion to waste such as bone.

It must be admitted that we have become biased by custom, that what we have been in the habit of buying we continue to accept without question, that whatever tastes a little different or possesses a slightly different texture or even bears a different name must be accepted cautiously and subjected to test and criticism before it becomes a staple article of our food. How many of us have seen fresh-water fish caught by hook and line, when, as long as they turned out to be trout or bass they were respected, but as soon as a chub or a perch appeared it was thrown away, while a cat-fish or an eel would be shunned and even the hook and part of the line sacrificed in an attempt to get rid of it without contact.

Whoever will visit Bonsecours fish-market in Montreal or a similar market elsewhere on a fish-day will find that there are species of fish disposed of now, and even sought after by certain foreigners, that in earlier years we never dreamed of seeing offered as food. In the sea there are also eels and other eel-like fish, cat-fish of a different species from those in fresh-water, dog-fish of a different order from those bearing the same name in lakes, and many other kinds that are doubt-

less good eating, notwithstanding their unattractive appearance and repellent names.

With regard to the last the U. S. Bureau of Fisheries has recently initiated an attempt to overcome any prejudice that might be conveyed in the name by proposing new and more euphonious appellations. The salt-water dog-fish is to be called "grayfish"; the misnamed black cod is now to be known as "sable-fish." The dog-fish does not belong to the same great group of fishes that supplies our most reputable marketable species, but that is not a sufficient reason for discarding it without trial. It undoubtedly possesses a white flesh, and lives on good food itself. Examination of the stomach-contents of numerous individuals shows that herring and other small fish form a large part of its diet—in fact the name dogfish suggests that its life in the sea resembles that of the dog on land, and fishermen can testify to its destructiveness to their catch and also to their nets. Its abundance at times is so great as to constitute it a pest, occasioning government bounties for its destruction, or the building of fertilizer-plants for its conversion to useful products.

The black cod is not a cod at all, belonging to a different family of fishes, and it is quite proper that it should bear a common name that does not associate it with cods. It has been called coal-fish, skil, and beshaw, of which the first is also applied to the pollack, a common member of the cod-family on the Atlantic coast. The black cod, or as we must now call it the sablefish, is a resident of the Pacific coast, occurring from California to Alaska, but commonest and most valuable as a food-fish in the northern part of its distribution.

The blue cod, cultus cod, ling cod, or buffalo cod is another misnamed Pacific-coast fish closely related to the last, but belonging to a different family and equally useful as a food-fish.

The red cod, red rock-fish, or tambor belongs to a still different family, that has numerous representatives on the Pacific coast and the single Atlantic species called the rose-fish, Norway haddock, hemdurgan, redfish, snapper, and red perch.

If the grayfish proves to be more palatable than the dogfish, then there are many of its larger relatives among the sharks that are doubtless of equal value, and the skates may come into more extensive use than heretofore. Sturgeons and their eggs (caviare) might be more sought after and even the gar-pike and the bowfin (fresh-water dog-fish) may come into their own. Cat-fishes and suckers furnish a mass of fish-food to inland districts, while carp, chub and moon-eye lead over to the great group of the herrings with both Atlantic and Pacific marine and fresh-water representatives. To the former belong the common, fall and summer herrings, the gaspereau (or alewife) and the shad, and menhaden; to the latter the skip-jack or Ohio shad and the gizzard or hickory shad. The smelt and capelin must be mentioned, and then the great salmon family, including the white-fishes and the trouts. In the first are grouped the common, the round and the Sault white-fishes together with the cisco and the tullibee of the great lakes; in the second the grayling of northern rivers, the Atlantic salmon with its land-locked varieties, the lake trouts and the brook trouts. On the Pacific coast and entering the rivers of British Columbia are half a dozen species of salmon, belonging to a different genus from our Atlantic salmon, as well as several species of trout distinct from our eastern trouts. The salmon family constitutes our most attractive and most valuable group of fishes.

To continue the enumeration of the more outstand-

ing food-fishes there are the pikes, of which the chief are the common pike and the muskallunge of our inland waters, the eel of both sea and fresh waters and the conger eel of the sea. The sword-fish, and the tunny are large and valuable fishes but with a restricted market. The mackerel, with its graceful shape and beautiful colouration, is another salt-water fish, well known from its abundance and food-qualities. In fresh-water are the calico and rock basses, the sun-fishes and the black basses, the yellow perch, the pickereels or dorys, the striped and white basses, and the drum or sheep's-head among others of good quality. The cunner attracted by the offal about wharves and its brother the tantog from deeper water, the rose-fish or red perch, the wolf-fish or cat-fish of the sea, and several less likely looking species such as the wry-mouth, the eel-pout, the lump-fish, mola and angler or goose-fish must not be passed unnoticed. The cod-fishes stand next in importance to the salmons and are represented by the cod, haddock, pollack, hake cusk, tom-cod and silver-hake of salt water and the ling of fresh water. The flat fishes are also of great importance, being headed by the halibut of both Atlantic and Pacific coasts, the turbot, flounders and sand-dabs.

In estimating our fisheries, it is important to distinguish those fishes that occur singly or in small numbers from those that are found in schools or large numbers. The first can not be depended upon in building up a demand and supplying a constant market. They are of value chiefly as novelties and in catering to special tastes. The masses of the people want something they are acquainted with, that they can depend upon, that they can obtain regularly. Such are the white-fish and trouts of fresh-water and the trouts, salmons, mackerel, herrings, smelt, cod, haddock and halibut from the sea. These not only occur in greatest numbers but have the broadest distribution, so that people have become most familiar with them and have received their knowledge of fish from them, whether as to beauty of form, colour, and movements or as to quality of taste and nourishment.

Our most valuable single fishery is that of the salmon, amounting last year to \$11,262,381. The cod-fishery totalled last year \$4,489,496. For brevity and facility of comparison those of over \$100,000 yearly value may be tabulated:

Salmon.	\$11,262,281
Cod	4,489,496
Herring.	2,906,887
Halibut.	2,261,776
Haddock	1,232,022
Sardines	1,229,006
Whitefish	1,048,641
Mackerel	990,329
Pickereel	901,183
Trout	870,209
Smelt	632,733
Hake and Cusk	520,051
Pike	347,355
Pollock.	193,788
Tullibee	165,569
Alewives	120,126
Swordfish	106,090
Eels	104,237

Since salmon, trout, white-fish and tullibee all belong to the salmon family, the total value of this family was \$13,346,800.

Similarly the cod, haddock, pollock, hake and cusk belong to the cod family and net \$6,435,367.

Herring, sardines (which are small herrings) and alewives, of the herring family, aggregate \$4,256,109.

ATLANTIC BIOLOGICAL STATION.

(By a Special Correspondent).



IN MUCH the same spirit that weary souls retire to a religious retreat for meditation, uninterrupted study and communion with kindred minds, scientists flock from far and near to the Atlantic Biological Station at St. Andrew's, N.B. Charmingly situated on a point of land jutting out into the St. Croix River, where it empties into Passamaquoddy Bay, the little settlement clusters together half hidden among the trees.

The Biological Station, which is under the jurisdiction of the Department of Marine and Fisheries at Ottawa, was built some eight or nine years ago. At first the research work was carried on in a houseboat that was moved from place to place, Malpeque, Gaspé Bay, and other districts in the Gulf of St. Lawrence. Finally after considerable wandering it was decided to locate the permanent station at St. Andrew's by-the-sea. Some twelve or fifteen Canadian scientists, mostly professors or teachers from universities, annually investigate the scientific problems connected with the fisheries. The greater part of the work is carried on during the summer holidays, but it is rare that these devotees of the cause of science do not depart in the autumn laden with many specimens and resolutions for continuing their studies throughout the winter. Most of the work is done gratis, except for actual expenses which are defrayed by the Government.

Dr. A. G. Huntsman, of the University of Toronto, the permanent curator of the station, is conducting an expedition to investigate the fisheries in the Gulf of St. Lawrence, and in his absence Dr. J. W. Mavor, professor of zoology at Union College, Schenectady, is in charge.

An investigation into the fluctuations of the fisheries was commenced some four years ago by Dr. Mavor. The fisheries differ in quantity from year to year, and the object of this branch of the work is to ascertain whether there is a continuous decrease of fish in Canadian waters, or a decrease for a few years followed by a corresponding increase. In the same way that a statistician studies the population of a country, noting the age of the inhabitants, Dr. Mavor is studying the population of fish, investigating the length of their life and the causes of their death. The age of the fish is determined from the number of rings on the scales in the same way as the rings in a cross section of wood gives the age of a tree. Fish differ from human beings in that they are practically all born or spawned at the same time of the year. Another difference is that fish continue to grow practically throughout their whole lives, while the human population reaches physical maturity at about 21 years. Thus the age of a fish can also be told approximately from its size.

In particularly favorable years a great many fish are spawned and this gives rise later to a heavy harvest of fish of that year's "class" or age. Thus, successful years are often caused by the abundance of fish of a certain age. When the fish of a certain age are being caught there follows a period of scarcity until the offspring of these abundant fish have grown to maturity. By studying the nature of the fish population through a number of years it is possible to predict in which years there will be an abundance, and in which years a scarcity of fish.

This is one of the chief causes of fluctuations in the fisheries. But there is also the question of fish diseases to be considered and their effect on the fish

population. Dr. Mavor has determined that except for far-reaching epidemics, diseases do not attack fish, but it is an open question as to whether it will be possible to control these epidemics in the same way as human diseases are checked. Dr. Mavor has confined this phase to the gadoid species, cod, haddock, pollack and hake.



FOR nearly three years Dr. J. Playfair McMurrick, professor of anatomy at the University of Toronto, has been engaged in a comprehensive study of the minute-organisms found in the waters adjacent to the station. All water is teeming with life on which the fish feed directly or indirectly. Either they consume this "plankton" or they feed on creatures which live on it. Therefore, the importance of an exhaustive survey of the varieties and abundance of animal life existing in Canadian waters can hardly be over-estimated from a point of

of countries interested. Russia explored the nature of the waters of the Arctic coast, and Denmark studied the Icelandic shores. Unfortunately the work is at a standstill at present, as such international co-operation is impossible under warring conditions, quite apart from the fact that the majority of these scientists have been actually drawn into the war.

The investigations made by Dr. McMurrick in the St. Andrew's district since 1915, show a marked similarity in general character to the results obtained by the European scientists. Tows are taken at a number of specified localities in this vicinity, either once a week or once a month, as the case may be, throughout the year. For this purpose Dr. McMurrick uses a net of fine silk voile, towed for twenty minutes behind a motor boat. From the results of these tows Dr. McMurrick has selected some forty or fifty species of animal and plant life. He has compiled a chart show-



Atlantic Biological Station, St. Andrew's, N.B. (Low tide).

view of obtaining basic knowledge on which to build further experiments on the habits of fish.

To emphasize the value of a study of this kind, it is only necessary to turn to the work that has been carried on by European scientists. In 1902 and 1903 a survey, similar to that of Dr. McMurrick, was organized by all the countries bordering on the North Sea, to classify the animal life found in those waters. It was not until 1908 or 1909 that the work was fairly under way, but from then until the outbreak of the war a very exhaustive study was made and records of utmost value were compiled. The North Sea area was divided among the neighboring countries, Great Britain undertaking her share, France, Belgium and Holland co-operating in the work, while Germany, Denmark, Norway, Sweden and Russia completed the list

ing how abundant these forms are at different periods of the year. He has found that there is a period when plant life is very abundant and another when animal life predominates, and also that certain species occur to a marked degree in one locality and are entirely absent in another. It is expected that these results will prove to have a direct bearing on the migration of fish.

The work of Miss Clara Fritz of McGill University, may be considered to be almost a subdivision of the general survey being made by Dr. McMurrick. Miss Fritz is engaged in classifying the diatoms found in the tows. Dr. McMurrick devotes some three columns of his chart to the diatom family, but these Miss Fritz has classified more minutely into fifty different species. But her work does not end here. She goes on to de-

termine which varieties predominate, at what seasons of the year they are most prevalent, and how deep in the water they grow. Her laboratory experiments also show that certain species may be cultivated in much greater numbers than they occur in the sea. Her results promise to be of unusual scientific interest as these diatoms form one of the main sources of nutriment of the fish.

The task undertaken by Prof. Alexander Vachon, of Laval University, Quebec, is also basic in character, designed to form a foundation for further experiments on the habits and idiosyncrasies of fish. Dr. Vachon is determining the salinity of the water in Passamaquoddy Bay and the Bay of Fundy. By the chemical method of titration he is able to ascertain the amount of common salt or sodium chloride in the water. It has been found that the total salt content of water is always in a definite proportion to the amount of common salt in the water. Samples of water have been taken in various localities every week or every month throughout the year. They were taken at different depths and in as many cases as possible results were obtained at 10 metres under water, 20m., 30m., 40m., 50m., 75m., 100m., 125m., 150m. and 175m., respectively. Thus, on his arrival at the station this summer Father Vachon found awaiting him a goodly store of bottles, rows and rows of bottles that resolved themselves into square feet of bottles that opened up the possibility of cubic feet of bottles—each one exactly like its fellows and no one any more like a ginger ale bottle than any other. For each bottle the professor performs the same pretty chemical experiment, filling the long summer days with an unending repetition, and his notebooks with the combinations and permutations of the numbers from 35 to 37 carried to two decimal places. Father Vachon has now completed the cycle of two localities up to date. In the one, which is situated at the mouth of the river St. Croix, the salinity increases in the winter when the river freezes and very little fresh water flows down. The other, situated in the ocean, shows little change. When he has completed another summer's work, he looks for interesting comparisons between one year's results and the next.



DR. CHAS. E. BURKE, of the University of Vermont, has undertaken a study which promises to be of primary importance in solving the great question of food distribution. Since the commencement of the war, foodstuffs have played a part that has become more prominent each year as the means of transportation have been intercepted and existing stocks depleted. The cry of "conservation" is taken up on all sides and every feasible method is being encouraged, whether it be salting, pickling, drying or freezing. The general feeling of antipathy towards cold storage plants has turned to one of sympathy and interest, as these companies are destined to play a large part in tiding the Allies through their annual food crisis. In turn these companies look to the scientists to help them bring their task to a state of greater efficiency. It is precisely on this far-reaching question that Dr. Burke has commenced his exhaustive studies.

It is a well-known fact that when meat is placed in cold storage for any length of time certain chemical changes take place. Although the temperature of the storage house is low enough to arrest bacterial action, autolytic action continues. Autolysis is recognized to deprive meat of some of its nutriment, as if it had been already subjected to some of the processes of human

digestion. Autolysis does not occur to any extent in eggs, and the question arises whether it has a deteriorating effect on fish, and if so how it may best be prevented. Experiments must be made with smoked, pickled and cold storage fish, but before doing so it is necessary to set up a standard of comparison.

To this end Dr. Burke is working this summer on fresh fish. He disinfects his samples with toluene to prevent the development of bacteria, which reduces the chemical action simply to that of autolysis. Experiments are made with samples kept at different temperatures, the heat of the room, blood heat, etc., and the freezing point noted every three hours in the beginning and at greater intervals later on, this being one of the most accurate methods of determining the progress of this chemical action. Another test is to measure the alkaline content which increases as the fish autolyzes. As Dr. Burke continues his research he hopes to obtain information of great commercial value, as to whether fish can be handled in such a way that autolysis can be prevented. At the present time fish usually stand about twenty-four hours before they are treated and very possibly this has a more harmful effect than is generally supposed.

The investigations carried on by Mr. Wilfrid Sadler and Miss Eleanor Shanly, both of McGill University, have a direct commercial bearing. Sardines have become the aim and object of the experiments, research, and excursions of these two ardent devotees of the cause of science. As is unfortunately but too well known to fish wholesalers—although the distressing fact may be hidden from the public at large who eat these fish—a tin of sardines is very liable to putrefy and swell. This is often a great loss to the trade. The Government has requested Mr. Sadler to make a thorough investigation of the conditions and causes involved. As a result of his last year's work, he has proved that certain species of gas forming bacteria bring about this putrefaction and swelling. By inoculating a good tin of sardines with these bacteria, he has produced a swelling similar to that of affected tins, and in this way he has defined the exact nature of the micro-organisms involved.



THIS summer his work lies in studying and experimenting with a view to discovering where the bacteria which cause this swelling come from and how they may be avoided. He is now concentrating his efforts on the canning process as employed at the factories. The sardines, after they have been sealed in the tin, are subjected to 129 deg. Centigrade of heat for an hour and a half, in order to kill all the micro-organisms contained. Apparently the bacteria that cause the swelling are immune to this treatment. Good tins of sardines are again being inoculated with the bacteria and subjected to varying temperatures, and results of a very practical nature are looked for at the end of the summer.

Miss Shanly's work on the sardine bacteria is of a more general nature. Each and every weir in this prolific herring district is visited and samples are brought back. Bacteria are taken from different parts of the intestinal tract and other viscera, in every case, and the results of the cultures are classified and compared. These experiments will show whether sardines found in salt or brackish water are more suitable for canning; whether it is possible for a weir to become contaminated and produce harmful bacteria in the sardines caught in them; why the bacteria

vary in different species; how fast the organisms grow and spread through the fish, and therefore how long they can be allowed to remain out of the water before they are actually canned—truly a monumental piece of work!

Dr. C. C. Benson, associate professor of physiological chemistry at the University of Toronto, is working on the pigment found in the shell and eggs of lobsters. There has been found to be a certain relation between the different kinds of pigment found in animals and plants, and considerable similarity in their chemical nature. For example chlorophyl in plants and haemoglobin, the red coloring matter of human blood, have certain fundamental chemical characteristics in common. It is with the object of tracing some of these fundamental points of structure that Miss Benson is working. The whole subject of pigmentation and animal pigment is of considerable scientific importance to-day.

The work of the station with regard to clams and mussels is under the care of Miss B. K. Mossop, of the University of Toronto, and Mr. Gerald Coote. Miss Mossop finds great diversion dressing herself up in her oilskins and exploring the mussel beds of the neighborhood. These she carefully charts on her return to the station, indicating the size of the mussels, the extent of the bed and the quantities found in a given area. She is also studying the rings on the shells to determine the age of the mussels. The object of her studies is to find out whether these shellfish occur in sufficiently large quantities to make them of commercial value for food, and whether a canning

industry would be a profitable investment. Mussels are used as bait in England and Scotland, and this phase of the work is not being overlooked by Miss Mossop. "The local fishermen have hitherto used herring as bait," she says, "but then herring have been cheap. Now they are becoming too dear for this purpose and it may be that the use of mussels will solve the difficulty." She is also studying European methods of mussel cultivation in beds similar to oyster beds to prevent over-crowding, so that the mussels can obtain sufficient nourishment. Fine large shellfish are produced in this way, and Miss Mossop emphasizes the importance of such an industry to Canada where the High Cost of Living has become a spectre all too menacing in its reality. Mr. Coote's work on clams is along the same lines as Miss Mossop's investigation of mussels. Two successful clam canning factories are already located in the vicinity of St. Andrew's, and it is possible that the field will admit of more extensive operations.

As yet no successful methods of preserving winter flounders have been discovered, and this delicate fish is still the luxury of the few who can afford to pay for special transportation facilities. Dr. Robert Chambers, professor at the Cornell Medical College, New York, has recently arrived at the station to study the life history, distribution and methods of catching these fish. Flounder fisheries have been carried on for considerable time off the New England Coast, but it is only recently that it has been taken up in Canada.



Fort Stanley, Ontario, East Side of Harbor, showing half of fishing fleet. The inland waters of Canada have many such centres of production of fresh-water fishes.

"WHO'S WHO, 1917."

DESBARATS, GEORGE JOSEPH, C.M.G., 1915;
B. Ap. Sc., M. Can. Soc. C.E.; Deputy Minister of the Naval Service of Canada since 1910; born 1861; son of George E. Desbarats and Lucianne Bosse; maiden name Lillian, daughter of Sir Richard Scott; two sons, two daughters. Educated Terrebonne College and Montreal Polytechnic School; honor graduate, 1879.

Various engineering positions on designing and construction of canals in Canada; railway construction in British Columbia; in charge hydrographic survey of River St. Lawrence, 1899; Director of Government Shipyard at Sorel, 1901; Deputy Minister of Marine and Fisheries, 1909; Plenipotentiary Delegate for Canada to the International Wireless Conference, London, 1912. Address: 330 Wilbrod Street, Ottawa. Club: Rideau, Ottawa.



G. J. DESBARATS, C.M.G. Ottawa, Canada.
Deputy Minister of the Naval Service of Canada.



H. B. SHORT, Digby, N.S.,
Chairman, General Improvement Committee, Canadian Fisheries Association.



The Sardine Industry in Canada

By A. BROOKER KLUGH.



THE sardine industry is, and has been for some time, a fairly important branch of our commercial fisheries, but it strikes me, as one familiar with the industry and who knows something of the trade in the products of that industry, that it has never reached as great a development as favorable natural condition would indicate it should have attained.

In this article I wish to first outline the industry as now conducted, for the benefit of those not familiar with it, and then to deal with some factors which would, I believe, lead to a considerable extension of the industry.

The true sardine (*Clupea sardina*) is a small fish of the Mediterranean and derives its name from the island of Sardinia. This is the sardine which is put up in France. The sardine packed in Canada, the United States, and Norway is the young of the Common Herring (*Clupea harengus*), from five to seven inches in length.

These young herring come in on our Atlantic coast, particularly on the coast of the Bay of Fundy, in immense schools from June to October. They are caught in weirs, which are large hoop-shaped enclosures of stakes, brush and net. The weirs are constructed far enough out from shore so that at low tide there will be from four to ten feet of water in them. A fence of stakes and brush, known as the "lead" runs out from the shore to the gate of the weir.

In the construction of a weir stakes are first driven in with a pile-driver mounted on a scow. Cross-pieces are then nailed from stake to stake, and long spruce and birch poles with the topmost branches still attached, known as "weir-brush," are bent in and out, with the top end downward, between the cross-pieces. Long poles are next nailed to the stakes, so as to extend high above them, and from these a net is stretched. Over the gate of the weir a weighted net is suspended so that it can be dropped and thus close the weir. Some weirs have but one gate, but most of those built now-a-days have two—one on each side of the lead. Weirs cost from \$300 to \$1,700 to build. They may not be built closer than a thousand feet from one another, and a license fee of \$5 is required by the Government.

The young herring, coming in from the sea, keep close to the shore. When they strike a lead they will not swim between the brush of which it is composed, but

swim along it into the mouth of the weir. The man who is running a weir lives close to it during the season, and as the fish fill into a weir on the high tide he inspects his weir each high tide, and if he finds fish in it he drops the gate. Usually the fish come in on a night high tide.

At low tide the weir is seined. The seine used is long enough to reach round the inner circumference of the weir and deep enough to reach to the bottom. The seine is stretched round the inside of the weir by a man in a dinghy or dory, then gradually drawn in until the fish are gathered into a practically solid mass.

Then the fish are dipped out with a huge dip-net having a long bag. The hoop of the net is placed in the boat and the bag pulled in, hand over hand, thus loading the fish into the boat. Some idea of the immense numbers of sardines which sometimes run into a weir may be obtained from the fact that as high as three hundred hogsheads, and a hogshead equals four barrels, have been taken at one time. From fifteen to thirty hogsheads is considered a fair catch and anything over two hogsheads as worth seining for. The price paid the owner of the weir varies from \$3 to \$30 per hogshead depending upon the abundance or scarcity of sardines. When the weir fisherman has fish in his weir he signals to a sardine boat, a flag or a little barrel set on the top of one of the weir-poles constituting the usual signal, and the sardine boat puts in alongside the weir.



THE sardine boats are usually from forty-five to fifty feet long and about thirteen feet beam, though some are larger. Until a few years ago they were sailing vessels only. Now, in addition to sails, they are equipped with gasoline engines, usually of about fifteen horse-power. Some of these boats are eighty-footers and carry more power. Some are owned by the sardine factories, while many of them are owned by private individuals who are paid \$1.50 per hogshead for short runs of from five to twenty miles, and \$3.00 per hogshead for longer runs.

As soon as a dory or dinghy has been filled with fish inside the weir it is rowed out to the sardine boat, into the hold of which the fish are loaded with a scoop-net, salt being shovelled on them as they are packed in.

On arrival at the factory the fish are hoisted from the hold to the dock and are sent down a sluice, and

deposited in brine-tanks. From these they go through the flaking machine which raises them to the next floor and arranges them in a layer over large trays known as "flakes." These flakes are placed in a large rack on wheels, which is wheeled into the steam-chest, where they are steamed for ten minutes. From the steam-chest they are wheeled into the drying-room, where they are dried in a hot-air blast. When dry they are removed from the rack and the flakes are carried to the packing tables, at which girls are at work packing the fish into tins. The tins and covers are stamped out of sheet tin by machines on the premises. In some factories scissors are used to remove the heads; in others they are pulled off by hand. So expert do the girls become at packing that the fish seem to fall naturally into their proper position in the tins. The tins are on trays which hold twenty-five tins each, and from the packing table they are taken to the oiling machine. The tray is placed in the machine and the pressure of a lever drops the right quantity of oil into all the tins at once. The low-priced sardines are packed in cotton-seed oil, while those to be retailed at a higher price are put up in olive oil. Many are put up in mustard sauce, in which case they go to the mustard machine instead of to the "oiler."

The tins are next fed into a machine which holds a supply of covers, and as each tin passes through the machine a cover is clamped upon it. The covers used to be soldered on, but now these machines clamp the covers on hermetically at the rate of thirty-five per minute.

Next, the tins are placed in a huge vat where they are boiled for two hours. Then the tins are dipped out of the vat with chain dip-nets, dried in sawdust, and shot down into the shipping-room, where the cases are made, and the tins labelled and packed for shipment.

When one considers the immense numbers of young herring which are caught in the weirs there must arise in his mind the thought that such a high "infant mortality" must surely deplete the supply of herring in a comparatively short time. Such a catastrophe has been predicted for a long time, in fact, ever since the operation of weirs began. Yet up to the present there has been no sign of any such depletion. In fact, some of the recent years have been among the best in the history of the industry, one weir-owner in 1911 making \$5,000 in two weeks. The probable biological explanation of the way in which the supply of herring is maintained in spite of the heavy loss of young fish lies in the very fact that it is young fish and not mature fish which are captured. At first sight it might seem that it amounts to much the same thing—that a herring taken is a herring lost to the race no matter what its age. But such is not the case, as among the young fish captured there is a very large percentage which would never reach maturity in any event, which would fall a prey to natural enemies. In the case of fairly long-lived fish which are captured when adult the loss is far more serious, as the individuals taken are those which have passed the dangers of juvenile existence and are about to perpetuate the species.

So much for the present condition of the sardine industry and for the outlook of a supply of sardines for the future. Now what of the further development of the industry?



THE first consideration is the turning out by Canadian factories of a higher grade sardine than that which they now put on the market. If we ask at the grocery for an extra fine sardine, what do we get—a Canadian? No! a French! If we ask for a good sardine, what do we get—a Canadian? No! a Norwegian! Not until we demand a cheap sardine are we offered the Canadian product. In this industry, as in so many others our factories have not catered to the high-class trade. Their product is good as far as it goes, but it does not go far enough—it stops short of supremacy. Now what constitutes supreme quality in a sardine? Three things—the fish, the manner of preparation, and the package. The fish we have in abundance, the very same species which is canned in Norway, and one equally as good in flavor as that put up in France, from which countries they are shipped to supply the high-class Canadian trade. It is in the manner of preparation mainly that our sardines are inferior to the imported product. In the first place I believe that the French sardines are not steamed and subsequently boiled when in the can, but are cooked in boiling olive oil before packing. Then in the highest-grade sardines the olive oil is flavored with a little bit of onion, a bit of truffle, and probably with other condiments which impart a superior savour to the fish. I see no good reason why our sardine should not be treated in the same manner. In the matter of the package again the Canadian product does not bear comparison with the imported article. True, we do not eat the package, but the way in which products are put up, particularly food products, has a lot to do with their success or failure in capturing the high-class trade. And now is the time for Canadian sardines to secure the best class trade of the home market, now that foreign products are much harder to import than in normal times. I know well enough that labor conditions and the price of tinplate and other commodities used in the canning industries make a great extension of trade difficult at this time, but these factors are no bar to the improvement in the quality of the goods, and it should be possible for our "Made in Canada" brands to secure a firm enough foothold in our own market that after the war they may be able to maintain their superiority and increase their output. A well-known Canadian firm of biscuit manufacturers has recently for the first time put out a line of high-class biscuits equal to the best British biscuits, and have secured a hold on the high-class trade which they will almost certainly be able to hold for all time, and it is time that other industries did likewise.

The second development of the Canadian sardine industry which I have in mind is the establishment of weirs and canneries on the Pacific coast. On the British Columbia coast we have a very fine species of herring, the young of which run in countless numbers along the shores, as I have seen for myself. Here it seems to me is a possibility which should be investigated.

"How fast is your car, Jimpson?" asked Harkaway.

"Well," said Jimpson, "it keeps about six months ahead of my income, generally."

PORT ARTHUR HATCHERY

A. J. McNAB.



FISH breeding at the Port Arthur hatchery is carried on extensively. Last spring there were planted out on the natural spawning grounds:

Whitefish fry	19,790,000
Herring fry..	13,085,000
Salmon trout fry	8,551,000
Salmon trout fingerlings	847,000

Total 42,273,000

The collection of eggs begins about October 1st. There is a man in charge of each fishing station, who sees that each fisherman is supplied with spawning outfit, such as pails, pans, and dippers, takes the eggs from each boat, measures the quantity of all eggs, keeps records and pays the fishermen at the end of the spawning season. The price paid is 25 cents a quart for salmon-trout eggs and 40 cents a quart for whitefish and herring eggs. Some industrious fishermen make enough in this way, apart from their regular occupation, to clothe themselves for the winter.

It is much better to return to the waters what belongs to them than to let go to waste. The old way was to throw all these precious eggs into the offal barrel.

The Fishery Branch of the Naval Service insists that all fishermen be taught how to take the eggs without destroying any. When Mr. Harpell visited this hatchery he saw for himself 19,000 salmon-trout eggs on the point of hatching—the young showing conspicuous eyes. These eggs were taken from one salmon-trout weighing 14 pounds. It can be seen at a glance what a waste and a loss to the people would have resulted if these had been thrown away. The fishermen would receive 75 cents for the eggs—the



A. J. McNab, Port Arthur.



Port Arthur Hatchery.

value of the fish producing them. Had this practice been followed for the twenty-nine years of my connection with fish-breeding there would be no question of Canada becoming starved out. The waters are different from the forests and the wheat fields—the forests may be burned and the wheat may be destroyed by hail, but there is little damage can happen to the fish. There is abundance of food in the water for all species:

As regards attention, 10,000,000 salmon trout eggs laid down in this hatchery require more care and labor than 150,000,000 whitefish eggs. As soon as the young of whitefish are hatched they are planted out, whereas the salmon trout young have to be kept clean and washed for six or seven months. In winter, at a

food, and spread in the surface of the water. In this way every fry in the trough will get a taste of the food, and in a week or ten days they will find it without having to spread it in the way mentioned. It is best to put most of the food at the head of the trough, in order that it may be carried down with the current. After three weeks feeding with liver we then begin the cooking of shorts or meal of any kind, or unripe roe, which is put through the machine along with beef-liver. This makes good food for the fry and may be made coarser as the fish grow. We feed at sunrise and repeat every two hours until sun-set. After two months the feeding may be repeated only every three hours, but we never fail to feed early and late—those are the times that all fish are looking for food.



Port Arthur Hatchery Interior.

temperature of 33 deg., it will take about sixty days before the food sacks are absorbed, and the fry require much care during this time. We have 700 floating trays upon which the young, tender fry are placed until they are strong enough to take care of themselves. They are then liberated into the fry-troughs and the trays re-filled with the younger stages. This happens two or three times during the hatching season. The greatest care of all is to be taken at the period between the absorbing of the food-sack and the beginning of feeding, when the fry swim to the surface of the water. This is the time to begin feeding—any delay will prove a great loss in that the fry will become poor feeders and will result in stunted fish.

In feeding the fry fresh beef livers are put through a meat chopper until it is fine enough to go through a 32-mesh wire-screen. It is then diluted with water until it can be beaten with an egg-beater. We then take something like a bunch of feathers, dip into the

YARMOUTH LOBSTER CATCH.

During the season of 1916-17, there were 44,101 hundredweight of lobsters, valued at \$537,300, caught in the Yarmouth district. Of this total 14,085 cases were canned and 18,201 hundredweight were shipped in shells to the United States and parts of Canada. The average price was \$12.18 per hundredweight. During the 1915-16 season, the catch was 60,754 hundredweight, which was valued at \$614,946. The average price during that season was \$10.12 per hundredweight.

In spite of the fact that lobsters were scarce, the past season was fairly successful, owing to the good price brought by live lobsters.

The prospects for next season are not bright, owing to the likelihood of the British embargo being continued and the scarcity of tin for canning the lobsters. --Yarmouth Herald.

The Fishmongers' Co. of London

The Fishmongers' Company of London, before which a short time ago Sir John Jellicoe delivered a remarkable speech on the war situation is one of the oldest of the great Livery Companies of London. Its chronicles go back to the year 1154, and unlike most of the survivors of the old Guilds it still exercises certain Guild functions. For instance, its officers, meeting the new conditions brought about by cold storage, undertake to mark and seal salmon caught in the open season, so that they may be legally sold afterwards.

Hazlitt, in his history of the Livery Companies of London says the oldest extant charter of the Fishmongers' Company bears the date of 1364. It is written in Norman-French, and makes it clear that the Guild was a flourishing organization many years before. In 1298 the Fishmongers' celebrated the return of Edward I from Scotland by holding a magnificent pageant. In the Royal charter of 1364, reference is made to rights and privileges enjoyed by the confraternity under the older English regime. It is declared that it was a

very ancient custom that no fish should be sold in London by other than fishmongers, except stock fish which belonged to the Mystery of Stock Fishmongers. An ordinance of the company prescribed the garb of a fishmonger to be "a jacket doublet or waistcoat without a gown"; these clothes only to be worn when in the market. Wardens of the company appointed buyers and sellers, and profits were limited to a penny in the shilling. Forestalling and regrating—buying from fishermen away from the market, or buying and then selling in the same market at an enhanced price—were forbidden under heavy penalties. Of course, the company does not now enjoy a monopoly as it did in the old days; but it is still great and powerful and takes a practical interest in the trade. It is rich, supports important charitable enterprises, and since the war has converted its great banquetting hall into a hospital for soldiers.

COLIN McKAY.

Boulogne as a Fishing Port

COLIN McKAY.



OLD BOULOGNE in peace times was the most important fishing port in France, sending its fleets to Iceland, the West Coast of Africa, and the Banks of Newfoundland, as well as to the North Sea and neighboring waters. Now its steam trawlers are mostly engaged in the grim and monotonous business of fishing for steel sharks and those deadly devil fish—the mines which the German pirates with diabolical industry plant about the coasts. And many of its sailing craft are laid up, growing dirty and delapidated, while their former crews are hazarding their lives for La Belle France in the Mediterranean, or some other part of the world at war.

But in war, as in peace Old Boulogne remains a port of passage—a meeting place of men from the four corners of the earth. Once Caesar's legionaries gathered here to set sail for the white cliffs of Dover; once the great Napoleon assembled here a formidable force to invade England. And now, by the irony of history, here now arrives every day thousands of British soldiers, bound for the fields of Flanders and Picardy to fight, side by side, with the French, against the descendants of the barbarians who overthrew the once mighty Empire of the Caesars. On the flood tide the troopships come in, swift boats crowded with khaki men. Gangways are flung out; streams of soldiers



Boulogne-sur-mer. Fish Market.

pour onto the quays. They come in battalions, in drafts of ten or twenty or a hundred, mixed with hundreds of unattached men returning from leave in Blighty. Shepherded by old, fat, hoarse-voiced disembarkation officers, with brass hats and red tabs, they drift out of the docks, across the bridge, and flow into a confused sea of khaki along the embankment of the little river Liane under the shadow of the imposing post office. Here the officers who have charge of the task of entraining troops for the front take charge of them. They are mostly ancient of aspect, large of girth and imperturbable, these officers. They bark out hoarse commands. A dozen captains, more lieutenants, and scores of N.C.O.'s bark out orders in their turn. They set the sea of khaki in a state of agitation. But in an incredibly short time the mob of men slips into ordered array, each unit in its place. And then off they march towards the waiting trains. They march past with disciplined step—men of England, Wales, Scotland and Ireland, and men from every land over which the banner of Britain floats. Hulking blacks from the West Indies, childishy curious, white teeth gleam-

—absent minded beggars going casually to war; tall, straight-backed Highlanders, in kilts, their dour faces full of purpose, their buoyant tread, and martial air, compelling one to realize, as the casual English Tommie never does, that war is a grim and deadly business.

In times that now seem primeval the Taubes used to come over old Boulogne daily. A salvo from the hills to the southward would announce their appearance. Bugles would blare; gun crews of patrol boats in the harbor would spring to stations. Soaring at a great height the Taubes would circle about the town, shrapnel shells bursting in fleecy puffs of smoke round about them. Sometimes they would drop bombs, but they never did any damage of importance. In course of time their visits ceased to attract any attention except from new drafts hearing perhaps for the first time the sound of guns fired with deadly intent. Army service corps men went on unconcernedly loading the long trains with mails, with munitions, with coils of barbed wire, with provisions and supplies of all sorts. R. A. M. C. men composedly transferred wounded from the ambulances to the hospital ships. At the little



Boulogne-sur-mer, Dechargement du Poisson.

ing in friendly grin; lithe East Indians, turbaned and dignified, impassive and calm, as befits the warriors of ancient fighting tribes; big Boers from the South African veldt who, but a few years ago were valiantly fighting against the might of the British Empire; stalwart Australians in cowboy hats, their faces florid and radiant with the health producing properties of a gracious soil and genial climate, their manner large and expansive breathing the generous democratic spirit of their land; New Zealanders, debonair and self-assured, the finest men physically in the Empire; Canadians, of a more rugged type, and with the froward air of adventurers; Irishmen of an untamed and reckless aspect; Englishmen of all aspects and sizes, burly men from the north country, clumsy men from the farming lands, sallow, undersized proletarians of the cities, all good humored, and of an incredible patience

booths, presided over by gracious ladies, seasoned soldiers sipped their coffee, heedless of the menace overhead. Fish wives haggled cheerfully with customers. And the Boulognaise generally would look at their watches and laughingly observe: "Well, the Boche has one virtue; you can trust him to be methodical in his habits."

* * *



SITUATED on the Pas-de-Calais, Boulogne is admirably adapted for fishing purposes, and in the decade preceding the war its catch was more than doubled. In 1912 its catch was valued at 26,000,000 francs—or more than \$5,000,000. At the beginning of 1914 it filled out 111 steam trawlers, 26 steam drifters, and 103 sailing craft—not counting a considerable number of small boats for shore fishing. A goodly proportion of the steam

vessels range from 140 to 175 feet in length, and are equipped with engines of from 500 to 700 horse-power. All the steam vessels which go to the North Sea, Iceland, Newfoundland, or the West Coast of Africa, are well furnished, and most are equipped with wireless telegraphy.

Boulogne is well equipped to fit out fishing vessels, and handle their catches, and before the war plans of improvement were being worked out which would have made it one of the best equipped fishing ports in Europe. It has building yards, repair docks, floating docks and slips. It has factories for the production of artificial ice, and depots where natural ice, imported from Norway, is kept in storage. Excellent arrangements have been made to quickly supply fishing vessels with ice, as well as with coal and other necessities. Many curing plants have been established, and special attention is given to mackerel—Boulogne mackerel having a great reputation in all the markets of France.

Boulogne possesses a school which undertakes to teach young fishermen a certain amount of navigation, and the technique of their calling. In connection with this school there is a small steam trawler, the maintenance of which is guaranteed by a state subvention, and on which the pupils of the school are given practical experience, fishing in the waters of the channel. Courses in wireless telegraphy are also given.

A more advanced school, intended to prepare fisher-

men for the position of captain, is also maintained in the port, and this school has facilities for advanced studies in wireless telegraphy.

Situated on the quay near the heart of the older part of the town is the fish market, a large and architecturally picturesque building. Here a certain portion of the catch is sold by auction, and there are certain sections reserved for the retail dealers. This market is within easy reach of the railway station. Much of the prosperity of Boulogne as a fishing port has been due to the facilities provided by the railways to enable the wholesalers to ship fish to the cities of the interior.

Before the war the various fishing fleets sailing out of Boulogne employed 6,000 men, and vessel owners were finding it necessary to recruit men from neighboring ports and from Brittany. This necessity raised the question of providing the men with house accommodation, and inducing them to bring their families to the port. With characteristic enterprise the municipality and Chamber of Commerce began to build cottages, and to sell them to fishermen on easy terms of payment.

In spite of its facilities the vessel owners and fishmongers of Boulogne are not satisfied that the port arrangements are as economical as they ought to be. They have plans for building a new dock to be entirely devoted to the uses of the fishing industry.

Canadian Oysters

J. STAFFORD, M.A., Ph.D., Montreal.

II.—Mode of Origin.



THE article of the previous month dealt with our two species of oysters as adults. Another subject is the manner in which such full-grown oysters come to be there—how they come into existence.

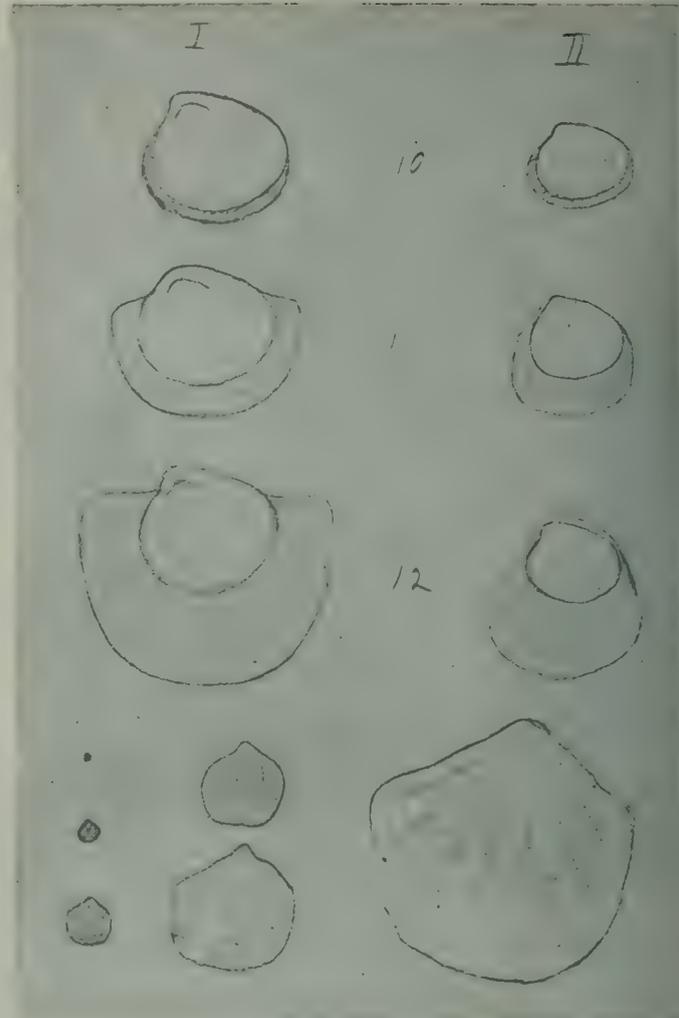
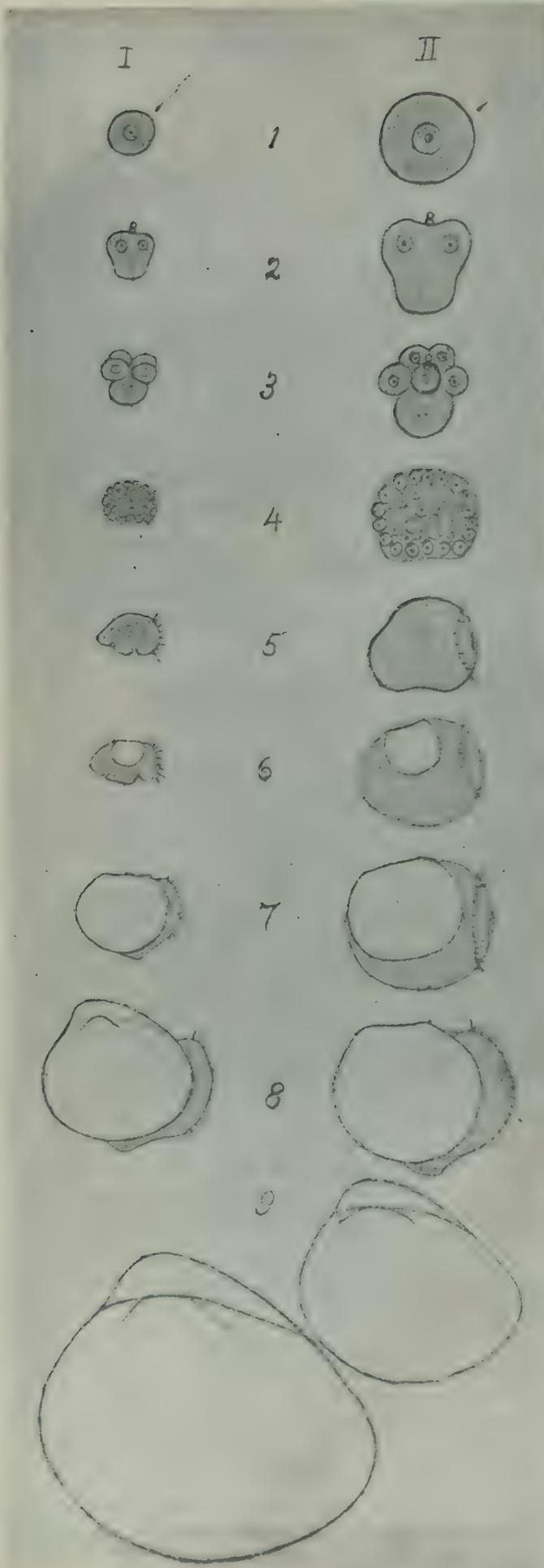
The mode of origin of birds by the hatching of eggs is best known of all animals to the masses of people. Oysters also originate from eggs, but the eggs are very small and inconspicuous objects, and are deposited in the bays where oysters abound. The hatching is performed by the warmth of the sun acting upon the water directly, or upon it indirectly through the influence of banks, beaches, bars, flats, and the like, where sand or other earthy matter is warmed by the sun and in turn warms the water that washes upon it. The breeding of oysters, and in fact, the whole life of oysters, is confined to comparatively shallow water, where the heat of the sun has most effect in raising the temperature. Since hatching depends so largely upon temperature, it is of course restricted to the warmest part of the year, viz., the summer months. The word hatching is used provisionally, because of its familiarity, but it must be stated that in the oyster there is no bursting of a hard shell and issuing of the young, as in the case of the bird's egg. The process is more appropriately described by the terms development, embryonic development, or embryology.

The eggs are produced in the body of the oyster, close under the surface layers or what corresponds to the skin of larger and more highly organized animals. When ripe, they are emitted in great numbers through a pair of ducts (oviducts, one on each side of the

body), that extend backwards and open into the space above the gills. From this they can be carried out by the respiratory current or can fall into the cavities of the gills and pass through the water pores to the chamber surrounding the gills and between the lateral flaps of the mantle. From this they need only to fall through the slit formed by the gaping valves of the shell to get to the outside.

In our two species of oysters the conduct of the developing eggs is to some extent different. In the Atlantic oyster the eggs are very small and pass to the sea-water outside at once or in a brief period after they have been discharged from the body. In the sea they are scattered by the slightest movements of the water, but most of them settle to the bottom near where they have been spawned. In the Pacific oyster the eggs are much larger and fewer and are not swept out into the sea at once, but are retained in the respiratory chamber of the parent for a period of about two weeks.

The number of eggs deposited by an Atlantic oyster has been estimated at 16,000,000 or more, depending upon the size of the oyster. The actual number in any case is of less importance than the fact that it is very great—up in the millions. In the Pacific oyster it is easier to approximate to the real number, for since they are retained in the branchial cavity they may be poured into a small graduate and the volume measured. Then by taking the measurement of an egg as viewed in a microscope and dividing its cubic contents into that of the volume of eggs the number will be sufficiently close. It is something like 10,000 for a single brood, but sometimes an oyster does not deposit all its eggs at one time.



Diagrams of Development of the Oyster Through Egg—Embryo—Larva—Spat—to Small Oyster.

Series I. of Eastern Oyster (*Ostrea virginiana*). Series II. of Western Oyster (*O. columbiensis*). Placed side by side Under the same magnification for ready comparison.

Figs. 1-9, Magnified 150 diameters.

Fig. 1, Egg and Sperm.

Figs. 2-4, Embryo in early, middle, and last stages.

Figs. 5-9, Larva from first swimming stage (5), through three stages of developing velum and shell (6, 7, 8), to the largest size of the larva (9).

Figs. 10-12, Magnified 50 diameters, spat showing larval shell (unshaded) and three stages of growing spat shell (Shaded).

The un-numbered figures are natural size spat—beginning with a small one like Fig. 12 and going by larger sizes to the largest of the first season's growth (i.e., spawned about 1st June, spat about 1st July, grown till about last September).

The size of the ripe egg (Fig. 1) of the eastern oyster is about 1-500 of an inch (or .05 of a millimetre). The egg of the western species measures twice that, 1-250 of an inch (.1mm.) It would take eight eggs of the former to make one of the latter.

There is another difference that may be mentioned here. Only about half of the eastern oysters deposit eggs the rest deposit sperm instead. The western oysters are not males and females, but every oyster spawns both eggs and sperm, although there are times when eggs are the main product and other times when sperm are produced almost entirely. The difference is not so great as at first appears—now and again an Atlantic oyster is found with both eggs and sperm.



BEFORE an egg (ovum) can develop it must be fertilized, i.e., meet and become united with a sperm-cell (spermatozoon) from another individual—sperm from the same oyster as the egg are not effective. That is no doubt the reason why in the eastern oyster they have ceased to develop in the same individual, and why in the western oyster there are rarely both eggs and sperm brought to ripeness in any abundance at the same time. In both cases living, active sperm discharged by one individual are taken in by the respiratory chamber of another individual that produces eggs. In the eastern oyster, on account of the brief time during which the eggs are passing through the respiratory chamber to the outside, it is likely that most of the eggs are not fertilized until after reaching the sea-water outside the oyster. But as oysters live in communities and the number of sperm is vastly greater than that of eggs, the water about oyster beds in the breeding season must be thickly charged with sperm, so that there is perhaps but little chance of any eggs going unfertilized.

For an egg to become an oyster requires an enormous accession and organization of new matter. This can not be done in great quantity and at once, but little by little and slowly. The old is at least partly organized and it transforms the new. As the amount of organized matter increases the amount of transformation of new matter can increase. The egg is a minute, more or less spherical, plastic globule of matter than has a considerable resemblance to the white of a hen's egg. This is what is called protoplasm. It is the really active, living substance. On the outside is a layer of a little denser and tougher nature, the egg-membrane. About the middle of the protoplasm is a still more minute spherule, the nucleus, containing granules and having a thin membrane of its own.

When small bits of an oyster's body are examined under the magnification of a microscope it is found that the whole body is composed of minute elements resembling the egg, but smaller in size and generally differing in shape. They may be spherical, elliptical, spindle-shaped, cubical, oblong, or much lengthened; but they possess similar parts to those already mentioned for the egg. The body is in reality made up of such elements much in the same way as a piece of honey-comb is made up of its cells filled with honey. These elements, whether found in animals or in plants, have long been known as cells, and are the structural units of living organisms in much the same sense as a brick is the structural unit of a brick wall. Eggs are cells that have become enlarged and specialized and separated from the body for the purpose of giving rise to new individuals. To make up a new oyster an egg has to divide to supply cells, and as that reduces their size, the cells have to grow to make up for the reduction. Growth in size and weight means the taking in of new matter. The taking up of new matter, the transforming of it, and the division of cells, as well as other changes, all require energy. The increase of matter and the increase of energy in the organism both come from the food-matter eaten and absorbed. For a time the egg and succeeding stages can not take in food and do not grow, but great changes take place through the influence of the concentrated food-matter stored as granules in the protoplasm. By the time this is used up and transformed into new protoplasm the

organism has reached a stage when it is capable of taking in and making use of fresh food.

In observing a fertilized egg (oosperm), it soon becomes evident that it is a living thing, for it not only changes its external shape, but there are movements of the nucleus, the granules and the protoplasm. In two, three, or four hours, depending upon the species, the ripeness and healthiness of the egg, the salinity, aeration, and above all, the temperature of the water, the single-celled egg undergoes a partial or almost complete division into two, three or more smaller cells, that do not separate from one another, but remain united as one body (Fig. 2). The process is not uniform all the way around, but proceeds fastest on one side of the egg, requiring more time to include the whole mass. At first the cells are relatively large, but with succeeding divisions, as they become more numerous, they become smaller, until it is difficult or impossible to distinguish them. From the very first the division of each cell is preceded by division of its nucleus, so that each cell has a nucleus of its own. Another phenomenon is the extrusion of one or two very minute globules from the egg, before its first division, that remain clinging to it for sometime and are known as polar bodies.



ALONG with the increase of number and the decrease of size of the cells there must also be mentioned the arrangement in a definite order. The region of the polar bodies and of the first division is different from the opposite region, where division is slow. If the egg is turned so that the small cells (micromeres) are uppermost and the largest cell (macromere) lowermost (Fig. 3) a vertical line falling through the centre will represent the chief axis and its ends the poles—the upper the animal pole, where there is greatest activity, the lower the vegetal, where there is greatest storage of food-matter. Already, in a rude way, there is a difference between the dorsal and the ventral surfaces. When the first clear division giving rise to small cells is complete, or when any one of the succeeding divisions is complete, one vertical plane can be distinguished along the chief axis that will divide the egg into equal halves right and left of the chief vertical plane. Already a sort of bilaterality is evident.

The half about the animal pole proceeds with division in such a manner that it seems to grow down like a cap pulled over the vegetal half, and the latter appears to be drawn up into the former, leaving a little depression below. When segmentation is complete (Fig. 4), the depression is a mouth, opening into an internal cavity, the stomach. There are two layers of cells, one inwards from the other, and continuous with each other at the mouth. The outer layer (ectoderm) gives rise to the surface and muscular walls of the body; the inner layer (endoderm) form the digestive canal. Between the two is the segmentation cavity. Already the cells are arranged to form certain organs such as mouth, stomach, and body walls. The egg has become a cellular organism. At this stage (called a gastrula) the animal pole seems to rotate somewhat along the chief vertical plane and the little organism becomes lengthened transversely to the original chief axis. At one end (anterior) minute hair-like processes (cilia) grow out and begin to flap, giving movement to the organism (Fig. 5), which is now to be recognized as an animal.

External parts can be determined with some care,

but internal structure is difficult to make out and requires all the advantages that different technical methods can contribute to assist and correct one another: microscopic examination of the living organism while in free swimming movement and when hampered by pressure, the use of killing, preserving, staining, and clearing fluids, the delicate and laborious processes of hardening, imbedding, sectioning, mounting, and interpreting of the sections.

A shell-gland is formed in the dorsal region and a pair of little shell-valves (Fig. 6) secreted, that grow larger and larger, enclosing more and more of the body.

The cells supporting the cilia form a distinct swimming organ, which becomes partially folded off from the rest of the body, making a more efficient organ of locomotion (velum) (Fig. 8), and acquiring the ability of being crumpled up and withdrawn into the shell. (Fig. 9).

Papilliform gills grow out along each side of the body, below the folds constituting the mantle, and become increasingly complex and capable. Two adductor muscles (anterior and posterior) stretch across between the valves of the shell, but later the anterior one disappears and the posterior becomes much enlarged. The digestive tract acquires a greater length and becomes folded, as well as showing special regions and a digestive gland (liver). A heart and blood vessels are formed. A nervous system, ear capsules, pigment spots and other organs may be made out.

A second organ of locomotion, a creeping foot, develops on the ventral surface of the soft body, behind velum and mouth, and between the gills. At this time the animal can creep over the surfaces of shells, stones, plants and other smooth objects at the bottom; it can withdraw its foot between the valves of the shell and, protruding its velum, rise and swim in the water above.

According to the degree of organization, or according to the power and mode of activity, there may be distinguished five stages in the life-history of the oyster: egg, embryo, larva, spat, adult.

The egg is the single-celled stage as it leaves the parent oyster; it is the simplest condition in the life-history of the animal. (Fig. 1).



THE embryo is the stage of multiplication of cells and their arrangement into layers forming the first cellular organs. Since segmentation of the egg begins by a simple division and proceeds gradually, it is difficult to fix a clear bound between egg and embryo. It has been a common custom to speak of at least the earlier stages of segmentation as still the egg. On the other hand it would seem more logical to include all the stages of cell-division as stages of the embryo. (2-4).

The larva is the free-swimming or free-creeping stage of development. There is a clear line of demarcation between it and the embryo, not so much in organization as in action. When the hitherto quiescent organism begins to move and to glide about, it is sufficiently plain to everybody that it has reached a higher plane of development, even if the only new structure that can be detected is the flapping cilia. (5-9).

The spat can be clearly delimited from the larva by the loss of locomotion and the assumption of a sessile mode of life—being fixed to a shell, stone or other hard object. (10-12).

The adult is difficult to distinguish in any definite manner from the older stages of the spat. One might

say it is the stage of full growth, but in that case an oyster would never be adult until at the point of death. Again, it might be said that the adult is arrived at when the animal is sexually mature, but in that case some would be adult in the same or succeeding year to their birth.

All these terms are terms of convenience and are useful and intelligible while we are regarding the most characteristic stage, although it is not always clear when one stage begins or ends. That comes from the fact that development is continuous and progressive—not by sudden jumps. For purposes of isolation and description, it is an advantage to divide the period of life into stages, even though these are not more clearly separable than the childhood, youth, manhood, and senility of man. It is possible by resorting to more minute differences of organization to indicate secondary periods in these primary ones, but that would lead to great detail.

Eggs begin to be spawned on the Atlantic coast of Canada in the last of June or first of July, but it is not possible to specify a fixed date since it depends upon the season and chiefly on the temperature. On the Pacific coast of Canada spawning begins in some season as early as the last of May.

The rate of development also depends chiefly upon temperature. In the height of the season the free-swimming stage is reached about five hours after spawning (and fertilization). After this, when the larva begins to feed, the rate of development and growth are still associated with temperature and food (which itself is also largely a question of temperature). It takes five or six days to arrive at the stage when the soft parts can be enclosed by the shell (8), and about a month before the largest size of the shell-bearing larva is reached (9). From the egg to this stage there has been an increase of length, for the eastern species, from 1-500 of an inch to 1-65 of an inch (.05 mm. to .385 mm.) In the western species the growth is from an egg of 1-250 of an inch to a larva of 1-98 of an inch (.1 mm. to .25 mm.) The western oyster begins with a large egg, is protected for a couple of weeks in the brood-pouch of the mother before issuing to a free life in the sea, and changes to a fixed mode of living at a much smaller size than the eastern.

As soon as the full-grown larva becomes attached, it is a spat, although its organization is at the moment unchanged. The first fixation is apparently accomplished by means of a cement-like secretion from a gland in the foot, that is poured out between the shell and the object to which it is being fixed, as the larva is lying on its left side. New growth is soon effected round the edges of the shell, the matter added to the left valve being made fast to the substratum, increasing the surface of attachment.

The young spat in a day or two loses its characteristically larval organs, such as velum and foot, which are now of no more use; but gills, intestine, blood vessels and other organs develop rapidly. The early and more fortunate spat may reach a length of over an inch before the cold weather of winter arrests their growth; later spat do not reach so large a size. During winter there is little growth in size, but some thickening of the shell and perfecting of the internal organization takes place. The alternation of periods of rapid growth with periods of little or no growth leaves concentric ridges and furrows on the surface of the shell, such that in many cases the age may be estimated. It takes about five years to grow to marketable size.

INSTITUTE TRAINING MARINE ENGINEERS.

Shipping Congestion Not Due to Lack of Ships But to Shortage of Men Necessary to Handle Them.

Professor Miller in Charge.



WORD has been received from Washington that one of the most effective ways Technology can do her part in instructing men to take up the duties forced upon us by the war is to train marine engineers and navigators. To this end, the Institute leads the list of technical colleges at which free courses are to be established for turning out engineers trained to man our future merchant marine.

Public opinion has hastily fixed the great difficulty of our transportation problems upon the lack of ships, but the fact that with the present comparatively small number at our disposal, fifty-five vessels were tied up in New York Harbor on June 28 alone, and a corresponding number at nearly every American port, simply because of the lack of necessary marine engineers to take charge, brings home the fact forcibly that the Institute's duty is not a small one.

Beginning July 9, free courses will be started at Technology. Stevens Institute of Technology, Hoboken, N. J.; Case School of Applied Science, Cleveland, Ohio; Armour Institute of Technology, Chicago, Ill.; Washington University, Seattle, Wash.; and Tulane University, New Orleans, La. These colleges were chosen because of the completeness of their laboratory equipment and of the fact that each one lies on or near a water front.

The entire work at Technology is under the direction of Professor E. F. Miller, head of the Department of Mechanical Engineering, who has made ample preparation to effectively care for the needs of as many men as apply. If the number totals 150, the Institute will furnish seven members of the Faculty to take charge of the various courses so as to insure as nearly individual instruction as possible. Up to the present time, thirty-four men have applied for admittance to the courses given at Technology.

These courses will be open to all who have had sufficient sea-going experience to warrant their acceptance. Applications for admittance must be sent to the local U. S. Steamboat Inspector. If the applicant is accepted, he will be sent to the nearest technical college which has been designated as a training school for marine engineers, where he will take a course which will fit him to hold one of the positions in the engineering branch of the merchant marine.

When his course is completed, he will be sent to sea for three months' training, after which he must present himself for examination before the Shipping Board at the port from which he started. Graduates of Course II at Technology will be permitted to enter immediately upon the courses which gives the sea-going experience without having to take the preliminary work at any of the institutions named; but the examinations given by the Shipping Board must be taken.

All of the men who wish to obtain licenses as marine engineers in the merchant marine are required to spend the three months at sea for experience. Pay during this time will be \$75 a month with board for the first two months, with the possibility of an advancement in salary if the man shows himself sufficiently capable to warrant it.

The rank which the applicant receives will be dependent upon the grade which he obtains in the Shipping Board's examination. All marine engineers will receive pay which is governed by the rank which they hold and the tonnage of the vessel they run.

The pay of a chief engineer is \$225 a month with board, while that of an assistant engineer is \$190. The assistant engineer of a tug, the smallest craft that is used, is \$90. In addition to the fixed salary granted, a bonus ranging from fifty to one hundred per cent is added for all men whose work carries them through the war zone during the period of the present conflict.

The proposition has already appealed to several men because the service does not require regular enlistment in the Navy and employment is independent of the duration of the war. All positions are government paid, but the men act in civilian capacity. Wages at the present time are attractively high and the opportunity for advancement is greater than it will be for many years to come.

William H. Seymour, '17, a graduate of Course II, who has had previous sea-going experience, has already taken the Shipping Board examination and received the rank of third class engineer.

FISH FOR FOOD.



IN extent and variety British Columbia's fishery wealth surpasses that of any other country in the world. What is being done to make this priceless asset play the part in the solution of the most crucial problem of the day it is capable of playing? What is being done to connect the public with a storehouse of sustaining food second only to our granaries? What steps are being taken to prevent the incalculable waste of fish while the whole world is confronted with a food shortage unexampled perhaps in its history?

The time is at hand when our fisheries must be viewed by the Government through other glasses than those which disclose only their commercial possibilities. It will have to regard them first as a source of food supply for the people, with their exploitation for profit as a secondary consideration. If this is not done we shall have the extraordinary situation of a country at war suffering with its Allies from scarcity of food with enormous reserves of the finest kind of food only partially utilized at its very door. We shall have a continuance of the exploitation of two or three varieties at a rate which is rapidly depleting them and the criminal waste of tons upon tons of numerous other kinds of edible fish on the ground that there is no "demand."

We have before us a report on our deep-sea fisheries by an official who three years ago was commissioned to conduct an explanatory survey for the Fisheries Branch of the Department of Naval Service. This officer, Captain Crichton, an expert with many years of experience in the fisheries service of the Old Country, appears to have done his work with great thoroughness and his report for the year ending March 31, 1916, contains information which the Government should review and act upon with no little profit to the country as well as to itself at this time. Captain Crichton deals particularly with the harvesting of fish other than salmon, halibut and herring, upon which the fishing industry has concentrated with a vigor and enthusiasm which for the most part leaves no room

for the development of other fisheries no less valuable, and for which there has been no systematic cultivation of the market—certainly not the Canadian market.

Dealing with the flounder family, for instance, Captain Crichton's report says: "I emphatically state that this branch of fishing must eventually have a great future, because we have in every bay and inlet and foreshore along the coast to the north of Seymour Narrows a never-failing source of supply of these fish of magnificent quality, variety and size. So far as I know, no one appears to be engaged in their capture beyond a few small boats which capture mud flounders of the lowest type within the environs of the Fraser River and Vancouver Harbor, which are placed on the market in a prehistoric and almost revolting manner."

Elsewhere Captain Crichton says:

"Such an enormous variety of edible fish frequent or are indigenous to our waters that it is difficult even to superficially detail them or rather to classify them. However, generally speaking, we have several varieties of **bass and rock fish, cultus cod, black cod, grey cod, hake, whiting**, and last, but to my mind the most prolific and valuable fish, the much despised '**red cod**.' All these fish are in abundance and, as far as I have learned or seen, no one has engaged commercially in their capture, with the exception of the cultus cod in the Gulf of Georgia.



"ONE often wonders why the Pacific market is practically confined to the everlasting halibut. The generality of people not engaged in the fishing industry no doubt are under the impression that no other fish save halibut and salmon exist on the Pacific coast. It is only a natural conclusion to arrive at. However, those engaged in the distribution of our fish food supply have no doubt some wise reason in holding back all other forms of fish food that literally swarm along our shores.

"I was running along the west coast of Vancouver Island, six or seven miles off shore, one September day, and had the honor of having on board some gentlemen officially connected with the Fishery Department. For a distance of close upon nine miles we passed through a literal field of dead **red cod** floating upon the surface of the water. Fish that had been hooked upon the halibut lines, taken off and thrown broadcast over the face of the waters as if they were carrion. Great distress existed in Vancouver that year and at that moment people were being fed by public subscription, and yet this appalling waste of valuable food existed daily, and yet exists.

"Within this year, 1915, down in the waters of the United States, existed a fish similarly despised, the tilefish. The waters were swarming with them, and yet they were beyond the reach of the people who craved for fish food in a cheaper form. The United States Government equipped a boat for the harvesting of these fish, and placed the resulting captures upon the public free. What has resulted? At the moment so enormous has the demand for these hitherto despised fish become, that a regular fleet of boats are now engaged in their commercial capture. I hope soon to see the day when these fish now finding no place in our markets may be similarly captured and become a source of long-felt food demand that must necessarily exist amongst our people."

Captain Crichton's report of two years ago makes very appropriate literature for to-day. If a food-control board is going to be established by the Government one department of it certainly should be charged

with the duty of getting our food fish to the people, and it should be clothed with powers sufficient to enable it to stop waste as well as discrimination in the marketing of the product. In any case the Government would be well advised to authorize the fullest investigation of this question in its relation to the present food situation in the shortest possible time.

THE POSSIBILITIES OF UNDERWATER CINEMATOGRAPHY.

By ERNEST A. DENCH,

(Author of "Making the Movies.")



WHEN the wonderful Williamson submarine motion picture invention was heralded, nine out of every ten folks thought that it was only destined to remain a scientific toy, that is to say, merely to provide entertainment for motion picturegoers. But they were wrong, entirely wrong. In the first place, a region which the cinematographer had not previously had access to was conquered. I admit that there has been pictures presumably taken under the water, but the public little knew that these were deliberate fakes. In a recent nautical drama I saw two divers fighting for life for sunken wealth at the ocean's bed. The cunning thing about it was that the divers actually went down from a boat on the real sea. But between the filming of those on and under water, several day's interval occurred. Expert divers are hired for the former work, the latter being left into the hands of the actors. Some movie firms have a glass tank lake in their studio where they can put on spectacular stunts along these lines.

The first film produced by the Williamson Brothers was in five reels, but twenty reels were exposed altogether and the choicest views retained. The production cost ran into thirty thousand dollars, which amount they have got back several times over. The inventors are more than mere amusement purveyors, for they are invading new fields with a practical object in view. In taking their first effort off the Bahama Islands, they located a Civil War blockade runner, which had vainly tried to escape the penalties of war. The ship was found at a depth of fifty feet, and George Williamson decided to act as a diver in order to put his brainchild to a new use. The local government loaned him a diving suit, in which he investigated the wreck while the camera man filmed all his movements. He came across pieces of eight cannon and other salvage, all of which he despatched to the surface by means of a wire basket attached to the end of a rope.

The experiment being successful, it occurred to Mr. Williamson that he might recover some of the wealth that has found a watery grave. Speaking of his plans, he said: "Some say there is more gold at the bottom of the ocean than there is in circulation; gold and silver have been sinking in the sea for centuries; millions a year going down and none ever coming up again. We think we have a method of getting some of this treasure which is not in too deep water."

The maximum depth the submarine tube invention can be safely used is a thousand feet. The steel tube is wide enough for two men to pass by each other while ascending or descending, and water is kept out by an inner covering of rubberized cloth. Air is pumped down, allowing the operator to work for hours at a stretch. The photographic chamber is at the end of

August, 1917.

the tube. This is hollow and made of steel, it being five feet in diameter. In a horizontal position is a steel funnel of the same dimensions. There is also a sheet of glass, two inches thick and a diameter of five and a half feet.

The further down the pictures were taken, it was found that more precautions were necessary to compete with the enormous pressure of water on all sides. This was managed by fixing two portholes at the other end of the funnel and enclosing them in steel. These two glass ports are three inches in diameter, the top one being for observation purposes and the bottom one for focusing the camera. As a further guard, the amount of compressed air pumped down protected against the unexpected, for there is a small steel shutter which blocks out the two port holes so that if the large outer glass broke, the operator would be as safe as if nothing had occurred.



THE Williamson brothers are also making arrangements to salvage the silver bars said to be on the "Mereda," which sunk off the Virginian coast. They will likewise raise the valuables which went down in the "Empress of Ireland." Films will record their accomplishments, two birds thus being killed with one stone.

The pictures will not be marred by bad photography, for there is a submarine light device which makes it possible to obtain clear views at depths and places where there would not be sufficient daylight. A wire is connected with a battery on the ship and this is lowered above the photographic chamber. At the end of the fuse is a metal submarine globe containing eight mercury vapor lamps, which have a twenty thousand candle power capacity. You can now clearly see that salvage is likely to be more effective and thorough in scope by the new plan.

When the film was shown before a distinguished audience at the United States National Museum in Washington, the harbor men and steamship officials were convinced that the invention would be of considerable use in investigating the supports of wharves and piers besides locating dangerous rocks and reefs little known or unknown to navigators.

On the other hand, scientists and educationists agreed that it could bring to light much on which only superficial knowledge exists. They were also delighted to discover a new fish in the picture, which was promptly named "Old Glory," because of the colored stripes on its body.

From time to time, producers have given us many examples of natural history studies. There was, however, always a certain artificialness about the producing of them since they were taken in the studio in a glass tank, the creatures being moved about by human hands so as to get everything according to text book knowledge.

Prior to the advent of the invention, genuine underwater scenes have only been filmed in places where nature has made it possible. "Neptune's Daughter" was noteworthy for some scenic effects which were secured by the installation of electric lamps in the caves off Bermuda.

Sometime back quite a consternation was caused by the taking of a motion picture in the Marine Gardens at Santa Catalina, California, where the water is reputed to be the most transparent in the world. The camera man worked through a glass bottom boat and affixed small magnifying glasses and mirrors to the

lens of the camera, which penetrated fifteen feet under water. If I am not mistaken, much will be heard of Ernest and George Williamson in future. They have made an auspicious beginning, anyway.

PRESERVING FISH FOR HOME USE.



WHEN the word "preserving" or "canning" is mentioned, the housekeeper usually thinks of strawberries, raspberries, peaches and other such delectable berries and fruits; some who have gardens, think also of beans and tomatoes and other vegetables. But few, doubtless, have ever thought of canning or preserving fish for future use. The Bureau of Fisheries of the United States Department of Commerce is urging housewives, particularly those who live near lakes or streams or the seashore, to preserve fish during the summer, when they are plentiful, in order to have a good supply on hand for food during the winter, when there are not so many in the market. Practically all fish are edible, they say, and add that purchasers should not be deterred from buying them because of an unattractive appearance, as some of the ugliest are among the best. Apparently it is a case of remembering the old saying that "handsome is that handsome does," although in this particular case, "tastes" might be substituted for "does" and the preceding adjective changed to one which might more properly be applied to food. In order to make their advice more valuable, the Bureau of Fisheries furnish directions for two easy methods of preserving, canning and salting.

To can fish, according to these instructions, one should begin by scaling or skinning the fish. When the fish to be canned is of the coarse-scaled, thick-skinned variety, the skin and fins should be removed and also the head, backbone and viscera. The meat should be washed thoroughly and cut into strips to fit the length of the jars and rubbed over with dry salt, using one tablespoon of dry salt to each pint jar of fish. The jars should be filled with the pieces of fish, packed as tightly as possible, the rubber ring adjusted and the caps put on loosely, so that the steam may escape, but no water should be added. These jars of fish should then be cooked in a pressure cooker for 1½ hour after the steam pressure registers 15 pounds or the temperature 250 degrees. Then the caps of the jars should be fastened tightly and they should be permitted to cool. The Bureau of Fisheries offers to furnish to applicants addresses of manufacturers of various kinds of cookers and each of these is accompanied with directions for using.

Thin skinned fish, herring and alewives, for example, should be scaled merely and not skinned, they say.

To salt the fish, begin somewhat in the same manner; that is, large fish having soft fins, small scales and thin skin, should be scaled, but not skinned. The head, tail, backbone and viscera should be removed. In the case of slender fish, such as mackerel, whiting, large herring and others of their kind, the backbone need not be removed. Smaller fish of the same order need not be split, but should be carefully eviscerated. Black bass, perch and other fish of the coarse-scaled, thick-skinned, spiny-finned variety, should be skinned, but need not be split unless large and thick meated.

When the fish have been thus prepared and washed carefully and thoroughly, in water containing a little salt, they are ready to be packed. Select a tight keg, barrel or other suitable vessel, so the directions con-

tinue, and cover the bottom with coarse salt. Upon this place a layer of the fish, sprinkle salt thickly all over it, add another layer of the fish and repeat the process until the receptacle is full or the fish all used. These pieces of fish should be packed one deep only.

The salt and the moisture from the fish will combine in making a strong brine in which the fish should be left for a week or 10 days. After that time it should be removed, thorough washed again, repacked in the barrel and covered with a freshly made brine strong enough to float a fresh egg. After another week, this second brine should also be removed and the barrel filled with what is known as a saturated brine, that is, one in which a little undissolved salt will remain on the bottom of the vessel after the solution has been subjected to a prolonged stirring. The old brine should not be used over again. All this done, the keg or barrel should be headed and stored in a cellar or the coolest place to be had. If there is any leakage—and this may be detected by the sound made when the barrel is struck with a stick at various heights—strong brine should be added through the bung-hole to make it good. Fresh fish should be used always and much care exercised in the salting, the proper mixing of the brine, in keeping the barrel tight, and the fish covered with strong brine.

If the keg or barrel cannot be filled at one time, it is added, the fish may be preserved by placing on top of them a cover made of a barrel head or pieces of wood fastened together with cleats and made to fit the container. This must be weighted down with a clean stone, or some other article, which will not be affected by the salt.

A GLANCE AT OUR FISHERIES.

(By a Special Correspondent).



CANADA with its many natural resources might well be termed "The Land of Promise" of modern times, and not the least among these is its fish and fisheries.

Beginning with its most eastern extremity, we have in the mighty St. Lawrence its wealth of cod, halibut, salmon, hake and other salt water varieties. Then we come along to Lake Ontario,—the first of the great chain of lakes with its numerous fresh water varieties, and supplying the bulk of the fish food to the people of the central district of that province, principal of which are white fish, trout, bass, pickerel, etc. Lake Erie, the next in order of the grain chain supplies the south western part of Ontario, with its harvest of white fish, yellow pickerel, perch, herring, silver bass, black bass, etc. Lake Erie white fish is the choicest fish of that variety to be found in any of the Great Lakes. Herring here are most abundant and run in size from three-quarters of a pound to three pounds each. There are many appetising ways of preparing this plentiful species of fish for the table. A great many of the larger varieties of Lake Erie fish are shipped to the New York fish market.

Lake Huron and Lake Superior, which are much colder and deeper than the other lakes of this great fresh water chain, contain an endless variety of fish, the choicest of which are the salmon trout and white fish. The trout in these lakes grow to great size, weighing as high as forty pounds each, and the white

fish run in weight from ten to twelve lbs. each. There are also sturgeon, perch, pickerel, pike, bass, tullibee, etc.

By far the largest amount of white fish supplied to the northern section of the country are caught in the inland lakes of the Kenora and Rainy River districts. Pike (or Jack fish, as they are more familiarly known among the northerners) are also more plentiful and caught at less expense in inland waters.

The Lake Superior fishing headquarters are at Rossport and Port Arthur. A fleet of small tugs is kept busy at the industry right up till the time when the lake freezes over. Herring is the big catch in Lake Superior.

As we leave the Great Lakes and go up to the North Country,—that vast area that lies between the head of Lake Superior and the Manitoba boundary, we find this section honey-combed with lakes, large and small, and which abound in white fish, lake trout, speckled trout, bass, pickerel and pike; the latter grow to an enormous size, it being no uncommon feat to pull out a pike three or four feet long.



THE lakes and streams of the north country provide a real sportsman's paradise, but the best of them at the present time are almost inaccessible. Nipigon River and Nipigon Lake are the best known, and the most frequented by tourists, but there are streams and lakes north and west of Nipigon which trappers and Hudson's Bay men state excel that region. Above the Tashota mining district, prospectors say there is a big river, which is fairly choked with trout, that has never yet been opened up by the fishing industry, or even whipped by a sportsman's line. You can take almost any given direction in that north country, and in due time strike a trout stream. At the present time this north country is the summer paradise of writers, artists, millionaires and adventurers from all over America.

Our Pacific Coast and its Salmon Fisheries and Canneries, in British Columbia, are world renowned, and were pretty thoroughly written up in the May issue of *The Canadian Fisherman*,—the first of this series of *Increased Fish Production*.

It is said that fishing is Canada's second largest industry at the present time, and with the Government continuing to do its part, and the people of the industry co-operating by putting forth a greater effort to put more fish on the market—*The Canadian Fisherman* stands ready to do its share through advertising and educating the people to eat more fish, the greatest food for mankind. Surely our combined endeavors should make fishing, not the second largest, but the largest industry in our glorious land.

NATIONAL FISH DAY IN CANADA.

The Canadian Fisheries Association has selected October 31 as National Fish Day in Canada, and arrangements are now in progress by the Publicity committee of the Association to make this the greatest event in the fishery annals of the Dominion. The day selected is a Tuesday, this being fixed upon with the especial object of separating fish from Friday, to which it has been attached from time immemorial. It is also planned to make this the inauguration of a universal Tuesday Fish Day every week in the year.

THE SALT SITUATION.

THE salt situation in the Maritime Provinces this year has been nearly akin to a tragedy. Some districts have suffered more than others, but with the exception of Lunenburg County, where the banking fleet did its own importing, practically no place has escaped. To make the situation still more exasperating there has been an unusual run of fish and we hear of fishermen having to throw their catch overboard and then desist from taking more because the salt barrel was empty. Magdalen Island fishermen have been imploring the Halifax merchants to come to their help, but without avail. At the time of writing it is hoped that a cargo of salt now due will be here in time to fill Magdalen orders by the next boat, but if this happens it will need to be pretty close work to do it. There was a report on the waterfront last week to the effect that Gloucester fish buyers were taking salt to the Magdalens, but whether this is true, and whether the quantity taken amounted to anything, we do not know. The Magdalen Islands bade fair to do very well this season and it will be a pity indeed if the slackness of the salt supply should upset this expectation. To-day's prices of salt in store in Halifax is \$4.25 per hhd. What a contrast with before the war when one could get all he wanted for \$1.25. The belief of the trade locally at present is that after this week there will be sufficient supplies forthcoming to meet all requirements.

Dried Fish.

The late reports from the Lunenburg fleet all indicate that fishing is good and it is now expected that the result of the season will surpass all previous records. It can scarcely fail to do so if prices hold anywhere near to what they are to-day. We hear talk of \$9.85 f.o.b. Lunenburg, as soon as there are any fish ready to offer. Shippers will probably lose money at these figures; that is to say, they will make on the large and lose on the medium and small sizes, but as long as one buyer is willing to do so, the others will have to do the same. The news from the shore fleet is that fish are plenty but salt scarce. The trade is hoping to get this latter difficulty straightened out by the end of the present week, as there is a ship due with supplies at the present moment. The West Indies are calling lustily for supplies of dried fish, but nothing is going forward, as forsooth there is nothing to send.

Lobsters.

An advance in prices is reported, attributable partly to the short pack of the past spring and partly to the increased demand from Europe, but chiefly to the intense competition prevailing among the rival buyers. The question of trans-Atlantic carriage is not thoroughly solved for the exporters yet, and so an element of speculation is connected with the present operations. Some sailings have been quite recently cancelled and a steamer from Halifax this week for English markets is reported to be unable to take all that is being offered to it. The general feeling in the trade is that shipping opportunities are bound to occur before winter traffic opens here, though some claim this is merely problematical. The report that a season to catch lobsters in Gaspé, parts of New Brunswick, P.E.I., and possibly along the northern shores of Nova Scotia, will be granted from August 10th to September 15th causes some dissatisfaction to the trade and especially along the Atlantic Coast. The lobster is not

migratory in its habits, and many fishermen realize that those caught this fall would be the same as those which would be available to them under usual conditions next spring when the weight and condition would be more suitable for packing purposes. Most packers find their supply of cans and bait inadequate for any extra pack and new supplies practically unobtainable, while the dealers fear that a new season with additional quantities of canned lobsters thrown on the market would tend to make buyers less eager for supplies and cause values to fall. One of the Halifax dealers states; "It is generally felt that a month's packing this fall will assure a shortage in next year's catch, and although political influences are said to be at work to obtain such a season it is to be hoped that the Government in view of all opinions expressed regarding Conservation will resist the appeal. An additional pack placed on the market this fall will reflect unfavorably on the prices obtainable for the winter pack on the Western Shores of Nova Scotia, while fishermen in other sections have suffered equally through the catch shortage as those who are petitioning for a new season. Seeing that the question has been raised some dissatisfaction will occur whatever happens, but the question of conserving supplies for the future should decide the issue."

SWAMP BOSTON WITH MACKEREL.

Over 425,000 pounds fresh mackerel awaited wholesalers at the Boston pier this morning, there being 13 trips in all th the fish pier. It was one of the biggest mackerel days of the season, the fish selling at 5 cents and 5.1 cents a pound.

The crafts took their fares off No Man's Land, wher large bodies of fish have been schooling for several days. They average mostly mediums.

The arrivals in detail are:

Sch. Harvard, Capt. David Keating, 28,000 pounds fresh and salt bbls. salt mackerel.

Sch. Mary F. Curtis, Capt. Lemuel Firth, 28,000 pounds fresh and 15 bbls. salt mackerel.

Sch. Georgia, Capt. William Surette, 40,000 pounds fresh mackerel.

Sch. Saladin, Capt. Wallace, Parsons, 60,000 pounds, fresh and 10 bbls. salt mackerel.

Sch. Victor, Capt. Douglass McLean, 30,000 pounds fresh and 20 bbls. salt mackerel.

Sch. Veda M. McKown, 35,000 pounds fresh and 16 bbls. salt mackerel.

Str. Robert and Edwin, 20,000 pounds fresh and 5 bbls. salt mackerel.

Sch. Monarch, Capt. Norman A. Ross, 25,000 pounds fresh mackerel.

Sch. Little Fannie, Capt. Charles Nelson, 5,000 pounds fresh mackerel.

Sch. Agnes, Capt. Robertson Giffin, 30,000 pounds fresh mackerel.

Sch. Helen B. Thomas, Capt. Rufus McKay, 60,000 pounds fresh mackerel.

Sch. Helen B. Thomas, Capt. Rufus McKay, 60,000 pounds fresh mackerel.

Str. Helena, Capt. John Matheson, 12,000 pounds fresh mackerel.

Sch. Rob Roy, Capt. Waldo, Carrigan, 35,000 pounds, fresh mackerel, 15 barrels salt mackerel.

Gloucester Daily Times, July 3.

CANADIAN FISH FOR ENGLAND.

It is reported in Canadian papers that the British Government has entered into a contract for the purchase of 600 tons of Canadian salmon per month—in addition, it is said, to the importation of canned salmon up to 50 per cent of last year's imports under the new trade regulations. It is also stated that a contract to furnish 14,000,000 lb. of frozen fish for consumption by the armies of the Allies has been awarded the Bay State Fishing Company of Boston, U.S.A. A small army of carpenters has been busy making packing cases. A fleet of steam trawlers will be used to bring the fish to port—flounders, as well as cod and haddock. Trawlers will also land fish at Canso, Nova Scotia, where the fish will be made ready for shipment, and the "freezer" at South Boston will be worked to full capacity. The fish will be frozen in pans holding about 200 lb. each, and the cases are the right size to hold this quantity, thus facilitating stowage and economizing space in the refrigerator ships. With proper care the frozen fish will remain solid for several weeks. A South African paper says it has been decided that some 5,000 tons of tinned crayfish, at present stored in South African ports, may be released for shipment to England under conditions ruling with dried fruits, and that this has been much appreciated by buyers in London, who anticipate a ready sale at high prices.

PREPARING MEN FOR BIG MERCHANT FLEET.

(From "The Tech," Cambridge, Mass.)

Six more schools for the training of fishermen to fit them for first officerships, will open a week from Monday, under the direction of Dean Burton of the Institute, at Atlantic City, Cape May, Philadelphia, Baltimore, Crisfield, Md., and Norfolk. The work of starting the schools is being rushed and arrangements have nearly been completed for supplying instructors for the young merchant marine officers. For Atlantic City the head of the institute will be Professor Harrison W. Smith of Technology; for Cape May, Russell Patterson, the son of a well known navigator; at Philadelphia, Professor Eric Doolittle of Harverford Observatory; for Norfolk, Professor S. A. Mitchell, director of the McCormick Observatory, University of Virginia has been named, while William R. Ransom, Professor of Mathematics at Tufts is still to be assigned a place. He was originally scheduled for the school in Boothbay, Me., which opened recently, but the director finally chosen is Captain Warren Shepard of the Rudder.

The task of running these schools was given the Institute by Henry Howard of the Shipping Board for the preparation of chief officers. The plan is to give intensive training in use of instruments, in computation and a few studies of the kind, to men with good nautical experience. Skilled in the technique of management of vessels the special training will afford to the Government quickly the much needed officers for the steel merchant fleet that is to be built. Mr. Howard, a graduate of the Institute in 1888, has undertaken a great variety of naval work for the Government and in this matter has left the organization and management of the schools to Dean Burton, who has turned for his assistants largely to the instructing staff and recent graduates of Technology.

The list given thus far includes fourteen schools and it is the purpose of Professor Burton to establish still other schools in Southern waters.

DOESN'T BOTHER BUREAU.

The Bureau of Fisheries now urges the American people to eat whale, informing us that it is "meat" and not "fish" and in texture, looks and taste resembles beef. Just where is there any good whale fishing, please? We are keen to compare rare roast whale with rare roast beef.—Portland Express.

Anyway, no matter how it eats, it sounds better than dogfish, doesn't it?—Biddeford Journal.

It certainly does. By the way, glad to see the Journal sticks to the right name of "dogfish." "Grayfish" according to no less an authority than Dr. Harvey Wiley, is a distinct misrepresentation and violation of the intent of the Pure Food and Drugs Act. As Dr. Wiley wrote in reply to an inquiry: "I beg to say that the law forbids all forms of misrepresentation, and to sell dogfish under a name which it is not, would be contrary to the provisions of the Food and Drugs Act."

A little thing like that, however, doesn't deter the Bureau of Fisheries in its determination to evade the real solution of the dogfish menace by foisting an "eat—'em—up" policy upon a long suffering public.—Portland Express Advertiser.

Try a few cans of grayfish brother. They won't kill you. On the contrary, as we have told you oft before, you will find it good eating. Cast prejudice and bias overboard. Incidentally speaking of misrepresentation, how about those Maine herring which have for years and still do masquerade under the name of "sardines?" What's in a name anyway? We may jar your delicate stomach which revolts at grayfish by telling you that we have just eaten some smoked monkfish and it was swell; also we "sat in" on a squid salad, recently that was delicious.—Gloucester Daily Times.

A BIG WASTAGE OF EGGS AT HATCHERY.

Large Proportion of Spawn Bought Has Been Lost Through Different Causes.

According to Sandwich fishermen there is at least one item in the department of marine and fisheries which Ottawa officials will not be able to explain by blaming the war. This item, amounting to \$89,358 was lost in fish eggs in Essex county in the past three years.

It must sound worse to the department to hear they have lost 297,860,000 eggs during this time. In 1914 some 113,000,000 eggs out of a total of 178,000,000 purchased, were lost. The balance, 65,000,000 were shipped to Kenora, Ont., Collingwood, Ont., and Selkirk, Man.

In 1915, the loss totalled 65,360,000, out of a total of 130,360,000. Then the fish hatchery was moved from Sandwich to Kingsville, where the egg tragedy was continued during the past year. Increased land values at Sandwich was given at the cause of the move by local government representatives. Fishermen say the eggs and alkali in the waste, at Sandwich did not agree, and the eggs got beaten to a frazzle in the fight for supremacy.

But Kingsville as a selection by the government for a hatchery has nothing to boast about, as already 117,500,000 eggs have been lost out of the total of 120,000,000 taken there last fall from Sandwich, which, in other words, means that the government saved only the difference, 2,400,000. Eggs are bought at 40c per quart of 40,000.



The British Columbia Commission

O. H. NELSON.

(Photographs and Biographical Notes of the Men, and a Brief Statement of the Objects of the Commission, were given in the July Number of *The Canadian Fisherman*).

Prince Rupert.



THE Royal Commission inquiring into matters affecting the northern coast of British Columbia, known in the Department of Fisheries as District No. 2 has completed its work as far as it can be done on the actual "ground." The commission consisted of W. Sandford Evans, of Ottawa, chairman; F. T. James, of Toronto, well known by reputation at least in all parts of the Dominion as one of the biggest fish dealers in the country; and H. B. Thompson, of Victoria, formerly a member of the British Columbia legislature, and a shrewd business man.

The commission under which these men worked was one passed by order in council at Ottawa. It stated that the Minister of Fisheries had found it impossible to come to a conclusion relative to certain matters, which affected this district, and directed the commission to proceed to the ground and make investigations there and report upon the matter.

While the members of the commission were unacquainted with the real situation the basis of the trouble originated in an effort on the part of Prince Rupert to obtain what that fishing port felt was its rights and the rights of the fishing community, as opposed to what the northerners called a monopoly which the Cannerymen possessed. To one disinterested there is no doubt that there was an exaggeration of the situation from both points of view. The residents of Prince Rupert felt that the cannerymen were systematically boycotting the city in an industrial way and reaping an immense harvest out of the salmon fisheries. On the other hand the cannerymen have forgotten that a community had grown up in the city of Prince Rupert since they began operations in the northern salmon waters and that some attention should of a right be given to that place. The situation is one that will in all probability clear itself and a better understanding between the parties seems already to be asserting itself.

Last winter the city of Prince Rupert, feeling that something should be done to assert the rights of the city and district, sent a delegation of three east, representing the city council, the Board of Trade, and the fishermen generally to press their claims upon the Fish-

ery Advisory Board at Ottawa. The delegation consisted of George W. Morrow, who had had a great deal of experience in various lines connected with the salmon industry in the north, having lived for many years in that part of the province; W. E. Williams, who was the chairman of the Fishery Committee of the Board of Trade, and Alderman O. H. Nelson, who has since been appointed a member of the Advisory Board for the Pacific coast.

From the standpoint of those whom they represented, the mission to Ottawa was a success. The Advisory Board made recommendations that were accepted by the Minister and many concessions sought were granted. These included the use of motor boats by those who wished to use them in fishing on the Skeena, the throwing open of the fishing so that the fishermen might dispose of their catch as they got it to any cannery, and the allowing of additional canneries on the rivers if they desired. The object of the citizens of Prince Rupert was to take the salmon canning out of the hands of the limited number in which it was and to make the fishermen more independent in the disposal of the fish. Up to the present the fishermen have been attached to the canneries and must sell to the cannery to which they are attached there being a limit placed upon the number of fishing licenses that are issued each year.

When these concessions were announced there was a protest from the cannerymen and strong representations were made to the minister and to the department in the matter. Presumably the minister felt that it would be well nigh impossible to settle this except by a commission on the ground. The commission, therefore, had its being and has made investigations on the spot, covering the various parts during the height of the fishing, the latter part of July. The Protection steamer of the Fishery department, *Galiano*, was placed at the disposal of the commission, and in this way they were able to cover all the ground visiting practically all the canneries and taking evidence of all kinds.



THE commission has gathered a great deal of information that will be of value to the department in other lines than that affecting the exact scope of the investigation. They took evidence when it was offered relative to the deep sea fisheries and to trolling and a number of other interesting points.

With the conclusion of the month of July the work

was finished as far as taking the evidence on the fishing grounds were concerned and the commission is now completing its work in the south, where the cannery interests are all centered and where the evidence from the standpoint of the canners can be obtained. While in the north the cannery managers were called and gave evidence as to what they knew with respect to the operation of the work. The questions involving the returns that are made and the selling prices of the salmon are all to be obtained in Vancouver, Victoria and New Westminster.

For the most part the cannery men are in favor of attached licenses and for the limit of the number of the canneries on the rivers. They, in fact, state there are now too many canneries and that the rivers are in danger of being depleted. Depletion, in fact, has started in, according to their view. They are also opposed to the use of motor boats as they contend that the cannery owners would have to provide them and the fishing would be more intense, tending to further deplete the streams.

There were some exceptions to these views on the part of cannery men, but these were by canners who were not included in the association and who are regarded by the others as intruders. In the case of the Canadian Fish and Cold Storage Company of Prince Rupert, which also operates a cannery, Mr. T. Johnson, the managing director, had no objection to the fishermen using motor boats where the license held was an independent one. He placed the cold storage and the fresh fish business ahead of the cannery in importance, urging for the fresh fish business the first claim. This he based on analogy with the fruit and other lines of business. In these he contended that the canning followed only where the production could not be taken care of in a fresh condition. It should be the same in the fish business, and he, therefore, claimed for the fresh fish business the first consideration.

F. W. Strang, of the Gosse Millerd Canning Company, which has been another intruder from the standpoint of the canners, was quite agreeable to allowing motor boats as it would allow the fishermen to deliver the catches at the cannery and save the putting on of boats to collect these. Both of these canneries are without a boat rating, having for the most part to depend upon the independent fishermen for a pack.

For the other side, the delegates who had gone to Ottawa defended the position taken and pleaded for a continuation of the conditions that had been promised by the department in response to the representations made. Mr. Morrow showed by the figures for many years past that, while in a season like last year there had been a falling off in the catch of salmon, this was not general but on the contrary there had if anything been an increase in the run of salmon. He filed figures relative to this. He argued also that the canners themselves operated as many as four canneries under one company on the Skeena, showing that they were not consistent in the argument that there were too many canneries now. They were always seeking new canneries.

O. H. Nelson pleaded that the citizens of Prince Rupert had desired to build up an independent fishing population in the place. This would be done in normal times he believed. There might need to be some encouragement and some adjusting of regulations from year to year for a time until it all got in good working condition. While it might be argued that the fishermen were as well off when attached to a cannery,

yet it was a condition that they did not like. The fishermen wanted to be able to sell to any cannery that would buy. For this reason the best of the white fishermen had left the salmon seining in the river and taken to trolling, where they operated their own boat—a motor boat—and sold to the highest bidder in the market. He favored white fishermen to the total exclusion of Orientals, if this could be done without complications in an imperial way. He would, in any event, go as far as possible in the exclusion of Orientals from the fishing.

Prince Rupert is waiting with a great deal of interest the decision of the commission hopeful that the concessions that have been granted will be continued in the interest of the building up of a white fishing population in this centre.

Prince Rupert.



AT THE taking of the evidence by the Royal Commission appointed to investigate the fishery question on the northern coast of British Columbia, the statement was made by O. H. Nelson, one of the delegates who had visited Ottawa and presented the case which led to the changes complained of being made, said that the city of Prince Rupert had sought to build up at that centre a fishing community that would represent the very best. It had been the hope of the citizens that the industry, both as to deep sea fishing and also with respect to the salmon end of the business, would be carried on by the best type of white fishermen. The end aimed at was to have a resident fishing population from which could be drawn the men necessary to man all the fishing vessels operating out of the city and in the district. This would be to the advantage of the whole of Canada. For, from the ranks of these men, it was but natural to expect, the men to man the merchantmen and those to man the navy would be drawn in time.

Mr. Nelson said that there had been times in the earlier days of the port, when the residents had become somewhat discouraged with respect to the securing of deep sea fishermen as residents. For a time the fisherfolk lived elsewhere, even while the boats came to Prince Rupert to land the fish. That had now been altered with time, and it was estimated that during the past season about three families a week had been coming to the city and locating permanently here, representing the fishermen who were plying to the port.

Any alterations that had been asked for in connection with the regulations governing fishing in the rivers had had for its object the idea of attaining to the same things with respect to that class of fishing. It was a matter of time and patience to accomplish this object.

The returns obtained by fishermen in the various lines on the Pacific are such that the wonder is that there are not more seeking this locality. An instance of what is made by fishermen working on a halibut vessel, where the returns from each trip are divided among the members of the crew after taking out the ship's share and equipping for the next voyage, will prove interesting. It is not pretended that this is duplicated in all cases, but on the other hand there are instances where very much better results have been obtained by crews. The "Malolo," a four dory boat under command of Capt. Bill Hurley, who, while an American citizen now, was born in Halifax, left the south early during June to enter the fishing off this port. 12 days out from Seattle, she arrived here with

35,000 pounds of halibut, and 120 spring salmon caught as a by-product on the halibut lines. The "Malolo" did not catch the best market of the time when she arrived, but, after equipping for the trip, the captain divided among his men on the basis of \$208 each. In two days he was on the banks again, having taken on bait, ice, oil, etc. He returned in eleven days with 48,000 pounds of halibut and 140 spring salmon. At the time of writing he had not sold, but would get a slightly better price than was obtained on the last trip, so, it is safe to expect, that the men will obtain nearly \$300 each.

The members of the commission themselves, during the proceedings, have given expression to the fact that they had learned, when interviewing the trollers who operate gasoline boats and take spring and coho salmon, that they had made in some cases as much as \$3,000 or \$3,500 a season, which lasts about eight or nine months.



STARTING the season with anything but a good outlook, the salmon canning on the Northern rivers of British Columbia is showing up remarkably well. To add to the difficulties for the year was the shortage of labor for the carrying on of the work. Northern B. C., in common with the West, gave liberally towards the prosecution of the war by enlistments that were perhaps out of proportion to the population when compared with some of the other parts of the Dominion. This made itself felt upon the fishing industry as well as upon other lines of business. The canneries gave liberally of their employees towards the war, and so this season many of the canners had to employ fresh men. Then, again, the demand for labor in all kinds of industry in the province made it difficult to secure fishermen, who had taken to new employments where steadier work was assured and where the pay was increased in order to hold them. All is looking promising now, however, and the pack will luckily be a good one. With the prices that prevail this is making the canners all look happy.

The sockeye pack, which is the most valuable, is going to exceed that of last year on the Skeena by a very considerable amount, according to the outlook now. Opening on the 20th of June the pack on the river at the end of July totalled about 90,000 cases. Last season the sockeye pack for the river was only a little over 60,000 cases. While the total pack to the end of July is not all sockeye, the great proportion of it is of that variety. Moreover, the sockeye are still running well and a most encouraging sign is that the fishing for the most part is confined to the waters outside the river itself so far. The big run in the river, when the fish are making for the spawning grounds, has not commenced.

On the Skeena, during the month of June, the pack was 5,557 cases. During the month of July it reached about 82,100 cases. With the fall fish pack yet to come there is every reason to expect that the pack will this year reach a high average. It totalled for the Skeena last year, 223,153 cases. In 1915 it went to 279,161; and in 1914, it reached 237,634.

The Naas River is giving good results also, according to the reports. The pack there for June was 2,360 cases, while for July it was 21,210 cases. Last season the total pack of sockeye in that stream was only 31,411 cases, so that the prospects for far exceeding that this year are the best. The pack for the Naas

in 1916 was 126,686 cases; in 1915 it was 146,838; in 1914 it was 94,890.

From Rivers Inlet the other main canning centre in district No. 2, British Columbia, comes the most encouraging reports, and the outlook there is for a high average at least. This district, which packs about three-quarters of the salmon put up in British Columbia, has the prospect of again having an excellent year. The fish have been coming steadily this season with no very large run so far. This has been of advantage to the packers, who in most cases are running a little short-handed and are not therefore as well prepared for a short rush of fish.

In addition to the canning that has been carried out by the Skeena packers there has been quite a quantity of spring salmon handled in other ways by the canneries. There has been 46,173 pounds of white salmon frozen and 10,346 pounds of steel heads treated in the same way. Then in the way of mild curing a large quantity has been taken care of. There has been 385 tierces of red springs put up in that way and 85 tierces of white springs. When it is taken into account that the tierce contains 850 pounds of salmon this accounts for quite a large amount of fish.

On the Skeena River alone this season, which is not far advanced yet, the value of fish put up by the canneries, in canning, as mild cured and in other ways, must pass the half million mark.

O. H. NELSON.

EAT FISH
For Health and Economy

MAKE
TUESDAY
AND
FRIDAY
YOUR SPECIAL FISH DAYS
EVERY WEEK

WESTERN PACKERS LTD.
Vancouver - Canada

The Canadian Fisherman has received copies of posters in red and black type, sent to their customers over the prairies by the Western Packers Limited, of Vancouver, carrying out the original idea of the Canadian Fisheries Association that Tuesday as well as Friday should be Fish Day.

We are glad to learn of this effort being made in the West and hope that many other fish businesses will follow suit.

EAT LESS MEAT AND MORE FISH.

An appeal to the public to eat less pork and beef and more fish is contained in a statement issued by the State Committee on Public Safety at Boston, Mass., recently. The statement points to the almost inexhaustible supply within easy reach of this city and calls attention to the availability of various kinds of fish not in general use but of excellent quality and moderate price.

Educational Dept., New England Fish Exchange



THE United States produces more fish and eats less than any other sea coast nation. With the most fertile fishing banks in the world lying but a few miles from its shores; the largest fish pier in the world located at Boston, Mass., one of its ports; and one of the swiftest and most efficient transportation systems possible at its service, the United States has not yet learned the lesson long since digested by Europe and Asia, that by increasing the consumption of fish, it will increase its general health and decrease the much discussed "cost of living."

Germany, Russia, with its great sea coast, the British Isles, all maritime countries, are such great consumers of fish that they are annually forced to import large quantities to supply the needs of their populations. America, ignorant apparently of the advantages to be gained by eating fish, actually exports fish to these countries, instead of using it herself.

England, one of the biggest importers of fish, consumes nearly 50 pounds per year per person. America, the greatest fishing nation, consumes between one and two ounces per year per person. Germany consumes over forty pounds per capita, and Russia over thirty pounds.

In the New England States, the centre of this country's fisheries, where the consumption of sea foods should be greatest, only about thirteen pounds of fish per capita are consumed annually. And inland, it is much less.

Yet there is no logical reason for this. Transportation facilities are such that fresh fish can be shipped to reach an inland consumer in far better shape than fresh fish caught in the Baltic Sea can reach even the port of Hamberg. The handling of fresh fish from the time it is caught on the banks to its delivery to the consumer has been reduced to a science.

Federal government experts, long engaged in what has been to date a somewhat fruitless endeavor to call the attention of the general public to the possibilities of fish as a healthful, tasty and economical food, bring out the point that increased consumption of fish should not mean an increase in price.

There is no cost of production, as is the case with meats, no cattle to be fed and fattened; no soil to be fertilized and weeded. The sea, unaided, produces the fish, and it requires only an increased demand to bring about an increase in the catch.

Another point to be noted is that Europe and Asia utilize as foods many varieties of fish disdained by the population of this country. The **skate** or ray, the **shark**, the **squid**, the **albacore** are sold here to some extent, it is true, but they find their sale among the foreign born population, which has learned from experience that they are not only edible, but actually delicious.

Familiarity, it is said, breeds contempt, and perchance this is the case with fish foods of this country. They are so easy to get, so reasonable in price, that their desirability is lost sight of by the consumer, while, abroad, where the fish are smaller in size, poorer in quality, and none too reasonable in cost, they are hailed with delight.

Fish is shipped daily to the inland West from Boston, but its consumption there is confined pretty much to former inhabitants of the coast States. Its use as a general thing in this country, too, is confined to one day a week, Friday. Abroad it is eaten several times a week, and, in some families, forms a regular part of the daily menu.

Knowledge of the many appetizing ways in which fish may be prepared for the table is largely responsible for this. The European housewife is an expert cook, a gentle art in which as yet the average American housewife has not trained herself.



TO cook fish properly does not require the cognizance of any mystic art, nor any particular trouble. But it does require knowledge. Like all simple matters, it's easy enough when you know how. Incidentally, there is hardly any variety of food susceptible to so many variations of cooking as fish. A cod, for example, may be fried, baked, boiled, made into patties, salads, and served in a thousand ways. In food value, and in taste, it is equally satisfactory whether served fried, plain, or made into an elaborate dish.

Nearly 165,000,000 pounds of fish are annually landed at the Boston Fish Pier, Boston, Mass., alone, and from this port fish are shipped to all sections of the country.

This is big salmon season for New England. The delicious and much esteemed red-fleshed fish has been very plentiful, large shipments having come through from the West Coast, and salmon of fine quality is selling cheaper at the Boston Fish Pier, South Boston, than steak cod, halibut, or swordfish.

Steak cod has been rather scarce for some time, while the supply of swordfish and halibut has been noticeably shortening up. The arrival of the big shipments of salmon supplied the New England market with quantities of one of the favorite sea foods of hotel menus.

Dealers at the Boston Fish Pier are quoting salmon at nine to fifteen cents a pound wholesale. As salmon is one of the richest of sea foods, and should be served in small portions, it can be readily seen that the public have an excellent opportunity offered them to obtain a delicacy, at the same time reduce the cost of living.

Salmon, of course, may be baked, boiled or broiled. The New England Fish Exchange cook book offers the following suggestions for cooking the fish:

Baked Salmon—Take salmon steaks, weighing about one pound each. Place in buttered saucepan with one pint white wine, one pint white broth, pepper, salt, grated nutmeg, parsley, and other herbs desired, and two ounces of butter. Let come to a boil, then cover and simmer for a half hour. Drain the fish. Thicken the liquid with flour and boil ten minutes. Then add yolks of eggs. Spread a layer of thick mashed potato in an oval baking dish, well buttered. Remove skin and bones from salmon and place the steaks on the potato. Fill with more potato, and pour sauce over all. Sprinkle with bread crumbs and bake until a light brown in a moderate oven.

Boiled salmon—Rub fish with salt, tie it in a cloth

and boil slowly for three-quarters of an hour. Serve with egg or caper sauce.

Broiled Salmon—Sprinkle slices of salmon with chopped parsley, mixed herbs, salt, pepper and olive oil. Arrange a well greased gridiron and broil over a clear fire, basting occasionally with oil seasoning. Serve with a white sauce.

How many kinds of fish have you ever eaten?

In answering this, the average resident of the New England States would probably name a half dozen fish, and these would probably be: **Cod, Haddock, Boston, Bluefish, Salmon, Halibut, and Mackerel.** A few persons would add **swordfish, smelt and herring.**

How many kinds of salt water fish are there for sale in your market?

And to this question the average New Englander would probably reply by naming the same fish. But, as a matter of fact, there are nearly twice as many varieties to be had, and from the very varieties not included in the above list are to be made some of the tastiest of sea food dishes.

can housewife in reducing the cost of her food bill considerably.

Early New England owed its good financial conditions largely to the success of its fisheries. The growth of the industry has given rise to a growth of other industries. Its fisheries still form one of New England's greatest assets. In these days one hears much of the slogan "Made in America." We are told that the proper way to show patriotism is to buy goods "Made in America." Fish are produced in New England, and the New Englander can show local price, as well as extreme good sense, by taking advantage of his fisheries.

There are three good reasons why fish should be the great food of New England. First, **health** demands it; second, it is the most **economical**; and, third, it is the sole great **natural food** produce of that section of the country, and the interests of New England industries require it.

That fish is one of the healthiest of edibles all authorities seem agreed. Stomachs which cannot assimilate



"Red Cod" thrown adrift from a fishing steamer off Prince Rupert because there is no market for them.

There is the **whiting**, for example. This fish, most highly esteemed in England, is little used in this country, except by the foreign populations. In England, they are fried. The tail of each fish is curled into its mouth, making the fish round like a doughnut, and in this way they are sent to the table.

FROM the ordinary **flounder** is to be made the much praised filet of sole. The flesh is cut from the bone, and either rolled over a meat skewer, or cooked flat and served with the proper sauce.

Cusk, a fish rich in oil; **scup, eels, squid,** homely but delicious; **skate, or ray, shark, horse mackerel,** and **catfish** are other varieties brought into Boston regularly which find little sale except among our foreign peoples. So great is the demand from the foreign sections for some of these varieties that their price is higher than that of the staples. Others, however, are landed in great quantity and their use should aid the Ameri-

meats, fruits and coarse grains can digest sea food easily, and for invalids and convalescents fish is frequently prescribed. Although the old theory that fish made brains has passed, with many other similar theories, into the fancies of a past age, there is no doubt that fish is good for the stomach and every internal organ.

Meats are difficult of digestion; fruits are acid; and grains are unsuitable for a continuous diet; while fish is easily digested, free from acid, and, when properly prepared, is excellent for a continuous yet varied diet.

It is a simple fact, which Government statisticians have often demonstrated, that the purchaser of fish gets more nutriment for his or her money than the buyer of any other kind of food. There is little or no waste, and fish contains, per ounce, more food value than an equal amount of almost any other food.

On the Troll-Fishery of Prince Rupert



THE development of trolling on the northern Pacific Coast has brought with it a serious question for the authorities to consider. This is the adoption of some method of preserving the fish that are taken by trolling and at the same time work as little as possible to the injury of the industry represented by the trolling fleet, which has now become quite a large one at this port. Trolling has been carried on on the coast to some considerable extent for a number of years past, but it was only this present season that it was decided that the trollers should be obliged to take out licenses for plying their trade.

To this the trollers have not objected, realizing that it was in the interest of the industry that they should have to take out licenses and thus be brought under the restrictions that may be imposed, as long as the license fee is as it now is a nominal one of one dollar and the restrictions are not too irksome. By requiring a license the regulations are made easier of enforcement, and at the same time the fishermen themselves are protected against foreigners coming in and interfering with the rights of the local men.

But on the score of regulations the fishermen who have outfitted for trolling are very indignant owing to the fact that the department in issuing the licenses specified that they should observe the same close season each week as has been the practice for the seine fishermen on the rivers.

There are two kinds of salmon only that take the hook—the spring and the coho. The latter runs late in the fall near the close of the salmon fishing season and the season for this variety is not a very long one. The spring is taken for a long season extending from early in the spring until quite well advanced into the fall. It is, therefore, a line of fishing that is permitted to be carried on with adequate returns gives employment to the fisherman for a large part of the year and tends to build up a permanent industry. In this way it differs from the ordinary seine fishing, which has a very short season each year and which therefore does not offer the same inducements to the building up of a permanent fishing class. The sympathies of the residents of Prince Rupert, as well as other places where the trolling has made a base, has always been with obtaining for the trollers the very best regulations that can be obtained.

From the standpoint of the department the spring salmon must have some form of protection, if the industry is to continue. It is alleged that this class of fish is being depleted. The canneries, which have their fishermen taking springs in the first part of the season before the sockeye begins in number, bear evidence to this fact. They contend that the trolling has injuriously affected their industry to this extent. They were able to keep their fishermen earning in the early stages of the season by taking springs until the increase of the trolling affected it.

On the other hand the trolling method is looked upon as a sporting method of taking fish. The operations are carried out in the open waters away from the rivers where the fish are going to spawn. Caught thus with a spoon and hook the fish have abundance of chance to escape, and it is hard to see how the fish-

ing could deplete the salmon under these conditions.

One of the best fishing grounds for the springs is off the northern end of the Queen Charlotte Islands, where these fish are found for a long season. This appears to be a favorite feeding ground for the salmon, there being an abundance of herring and other small fish in that neighborhood all season. Fishermen tell of seeing flocks of seabirds miles off, which is a sure evidence of springs. Following the birds, they find that they are feeding upon the herring and small fish that reach the surface, while beneath are the springs following up and preying upon the schools of herrings.



THE fishermen contend that the fish taken there are not, by any means, all on their way to the spawning grounds. On being opened the spawn is represented by a small thread which indicates to them that the fish will not deposit its spawn in the same year.

The fish that are taken by the trollers cannot be protected, it would seem, by the weekly close season, for they are not running, as is understood, in connection with the masses of the salmon of the Pacific Coast. The fish are feeding, and may remain about in the locality for weeks, perhaps for months. A close season under these conditions only perhaps prolong the time for the salmon. It would, therefore, appear that some other method must be found for the protecting of the salmon in the case of trolling as distinct from the seine fishing, when the fish are running in the rivers and making for the spawning grounds. In the later case the fish are running, and a close season allows a certain number to get past while the nets are raised. It is very effective, therefore, in letting the fish reach the spawning beds. It does not so work when applied to the taking of the fish while in the salt water, where they are feeding and taking their time, even if spawning fish, in getting to the rivers. The subject is sure to take a lot of consideration by those charged with the preservation of the fish of the coast.

PRINCE RUPERT.

The car shortage that affected the shipping of fresh halibut from here, has been overcome to a large extent, and the G. T. P. is now getting enough cars to take care of the business.

William Maddock, who, since the opening up of the business of buying here by the Booth Fisheries, has been in charge of the buying operations, is leaving for Seattle, where he will take a position with the company.

Cannerymen in this part of the country are very much exercised over the outlook for fishermen this season. In the past they have depended in large measure upon the Japanese, which class of fishermen was supplemented by Indians and white men. The war and the changed conditions that have followed have upset the whole situation. The Japanese are many of them finding better employment and for a longer season in other lines. The Indians have also found employment in large numbers in lumbering along this northern coast. White men are, of course, more scarce than ever before and the outlook is not promising.

Tom: "Is it true that you proposed to Alice and were rejected?"

Jack: "Not exactly rejected—she said when she felt like making a fool of herself she'd let me know."

Canada Might Benefit from the Suggestions

Statement of the New York State College of Forestry Concerning Full Utilization of the Non-Agricultural Lands and Inland Waters of New York State for the Production of More Food

Delivered to the Governor's Patriotic Agricultural Commission, May 3, 1917.

Premises.

Since its establishment in 1911, The New York State College of Forestry at Syracuse has been continuously preaching economic forestry—the right use of non-agricultural lands of New York State. According to continental experience, the forest is a community: it contains not only timber crops, but its animal life and fish life, beneath the forest canopy and in the streams, together make up the forest. The United States Forest Service recognizes this fact, since they not only sell mature timber, but lease grazing privileges, camp sites, recreation grounds, etc., and the foresters also exercise supervision over fish and game.

On account of the wonderful agricultural resources of this nation, the vast possibilities of non-agricultural soils in producing food have not yet been fully appreciated. The laws controlling our fish and game have been enacted almost entirely at the behest of sportsmen, and the use of fresh water fish and game for food is comparatively limited in this country. In continental countries, particularly in Germany, fish and game propagation has been intensively practised and according to newspaper reports, it is easier to-day for the Germans to purchase venison and birds than it is to buy butter, eggs and milk.

It is needless to call to the attention of your commission the situation in which this State and nation finds itself at present. We have had two lean agricultural years in succession and during the coming years we must not only feed our domestic population, but the Allies as well. This increased demand must be met with a decreasing number of farm laborers, owing to enlistment and munition activities. A statement issued from the Department of Agriculture at Washington ten days ago announced that the national food supply "was causing serious concern to government officials and that the domestic meat supply was 100 million pounds below normal." In such a crisis, every acre of land whether agricultural or non-agricultural should be made to yield every pound of food possible.

The College of Forestry has, since its beginning, consistently urged that forestry is complementary to agriculture, and that land unsuited to tillage which the agriculturist cannot use must be made to yield repeated crops of forest products of all kinds. The Federal Census Report of 1910 states that there are approximately fifteen millions of acres of land in New York State unsuited to agriculture under present economic conditions. Under continental system of management, such an acreage could, in short time, be made to yield a tremendous amount of foodstuff.

The extent of the inland waters of New York State is scarcely dreamed of by the average citizen. These waters particularly in the Adirondacks and the large lakes and streams throughout the State should be utilized to their maximum capacity in order that the food fish may be used to supplement the waning meat supply.

Dr. C. C. Adams, of the New York State College of Forestry, in his "Notes on Oneida Lake Fish and Fisheries," states that 100 tons of eels are caught each

year in this lake alone, and a press notice of last fall stated that twenty-three trap nets, illegally set in Oneida Lake, were captured by game wardens and their contents, consisting of 30 tons of fish, were allowed to escape.

From the above instances, some slight idea of the food fish which might be obtained from our inland lakes may be gained. Close utilization of our inland waters would, to a large degree, help out a depleted meat supply.

In view of the situation previously described, the Faculty of the College of Forestry with the especial aid of Dr. C. C. Adams, head of the Department of Forest Zoology, respectfully submit the following suggestions concerning the utilization of our non-agricultural resources, in order that the waning meat supply, particularly, may be increased.

I. That netting of inland lakes and streams for mature FOOD FISH be permitted, under State supervision by State officials during the period of the war. This taking of fish should be allowed in general only after the breeding season is over. A further detail would be to provide that the possession of such seines or nets for all except state officials be made illegal, with a heavy penalty provided.

Naturally, the above recommendation, if put into effect by your Commission would meet with strong opposition from certain quarters. As previously stated, the game laws have been largely enacted from the recreational and sportsmen's point of view, but in times of national peril, public need must take precedence. Food is and will be lacking, and all the fish that our inland waters can provide should be fully utilized without, however, exterminating any of our species. (See next paragraph for prevention of extermination).

II. Increasing the Number of FISH NURSERIES.

The Federal and State hatcheries located in New York are already sufficient to turn out large numbers of fry. However, when they are liberated, under ordinary circumstances, their natural enemies reduce their numbers tremendously. Fish nurseries can be built very cheaply and quickly to turn out tremendous quantities of fish which would soon reach market size. It is commonly the custom of Federal hatcheries to release a certain number of their employees during the summer season. Such men could easily be utilized by the State to take charge of the fish nurseries at the State hatcheries or elsewhere.

III. The Breeding of CARP by the State on a Huge Scale.

Just as in the Civil War, pork was found to be the war meat, so is Carp the war fish on account of the ease with which it is propagated and the rapidity of its growth. With large numbers of carp bred and distributed throughout the State, a tremendous amount of protein food could be secured within two years. At the present time carp are found upon the markets of thirty-five States, and approximately 20,000,000 pounds are sold annually.

IV. Refers to Shooting Licenses.

V. Game Farms.

VI. Open Lands.

F. F. MOON, Acting Dean.

The Canadian Fish and Cold Storage Company, Prince Rupert, B. C.



TO THE easterner the West has all kinds of surprises. Unless prepared beforehand for such a condition of things, it would be no small surprise for the visitor to the city of Prince Rupert, that only dates back to 1910 as an incorporated municipality, to find a fish establishment doing business there that boasts to be the most modern and the largest fish packing and storage establishment under the British flag. But, thanks to the excellent reputation gained by the product of the Canadian Fish and Cold Storage Company, the name under which the Prince Rupert establishment operates the "Rupert" brand of fish has spread the fame

Mr. George Collins, who organized the company and succeeded in getting it ready for operation at the coming through of the railway.

About the time that active handling of fish began and the operations became such as to require the attention of one trained in the fish business in all its aspects, the management was taken over on behalf of the company by Mr. T. H. Johnson, who is still in charge, having been over three years in this capacity. In selecting Mr. Johnson the directors went to the fish centres of England, where the business is carried on under the most careful management in order to meet the keen competition that exists there. Mr. Johnson



The Canadian Fish & Cold Storage Co., Limited, Prince Rupert, B.C.

of the plant across the whole continent of America. Not only on this side of the Atlantic is the Canadian Fish and Cold Storage known for its high class production, but to no small extent the firm has made itself known on the British market.

With the construction of the G. T. P. as a transcontinental line with connections direct with all the main parts of the United States and Canada, Prince Rupert became the logical place for the location of a great fish centre. This is so because the great bulk of fish caught in the Pacific Ocean are taken within a shorter radius of Prince Rupert than of any other port on the coast.

Those who invested in the Canadian Fish and Cold Storage foresaw this and accordingly have been rewarded by the building up of the great business that has come to them in the few short years that have followed the opening up of the plant and the completion of the G. T. P. as a carrier. A lot of credit is due

is certainly a fisherman. He has been born to the business in truth for he is the third generation which has continued to follow that line of business without a break. He is the son of Andrew Johnson, of the world famous fish company of Andrew Johnson Knudtzon, Ltd., of Hull, England. His grandfather was in the fish business when it was carried on by means of sailing smacks. With that style of vessel he did business in the North Sea. For forty years his son, Andrew Johnson, has been following the business, but with the most modern of craft in the same waters, building up one of the greatest concerns in England. For twenty-five years, T. H. Johnson, the manager of the Prince Rupert business, has been following in his father's footsteps, as far as the fish business is concerned, and as may be imagined received a very thorough training in the enterprise, which has served him in good stead in the management of this new Canadian enterprise.

In Mr. Johnson, the Canadian Fish and Cold Stor-

age Company has a most indefatigable worker. He watches every detail connected with the business and gives his undivided attention to it. The fish business especially on the Pacific Coast is constantly undergoing changes and in its many branches is in a transitory stage to no small extent. It thus calls for the exercise of the most careful judgment on the part of one placed like Mr. Johnson in charge of business of the immense proportions of the plant he directs. New methods of treating fish and the testing out of varieties that have not been used to any extent are constantly being tried. It is the proud boast of the concern that when any product goes out bearing the red label "Rupert" brand that it is the best of its kind that can be produced.

Permanency marks everything in connection with the Prince Rupert Cold Storage plant. The main building is of solid concrete, eight storeys high. Of these, six are above the main floor, where the fish are received from the boats that deliver them. The two lower storeys are given over to a considerable extent to the necessary machinery used in connection with the plant. The floors each have a space of 10,934 square feet. There are thus available six storeys of this space for fish. It is estimated that there is available in the building insulated space for the storage of fourteen million pounds of fish of various kinds. Throughout the building is of reinforced concrete, with cork insulation in all parts, and the most modern style of cold storage construction has been used in every detail, including mastic flooring in all parts. Electric elevators are used throughout the building for the conveyance of the fish to and from the various floors.

Some idea of the capacity for handling fish in such a plant as this can be conveyed by the statement that the Canadian Fish and Cold Storage has frequently handled 3,500,000 pounds during a month. This includes different varieties and shows that the plant is equipped for practically anything. Such a condition of things is necessary in a plant such as this, as there is a very heavy demand put upon it at times. Fish being so perishable there is no possibility of delay in the taking care of the supply landed. It must be taken care of in short time, and it is in the plant of the Canadian Fish and Cold Storage.



THERE are six sharp freezer compartments in the plant that are kept going practically all the time. There is a capacity in these of 120,000 pounds a day. But, while there is of necessity every convenience for the taking care of the fish in cold storage, it must not be thought that this is the main end of the business. On the contrary the influx of fish from the north Pacific Ocean is such that the storage is only a small part of the work done by the company. The main part of the business is that of shipping fresh fish. Halibut is, of course, the main part of the fresh fish shipments and the facilities for handling this is of the most modern and up to date character. The fish are hoisted by slings from the steamers or other vessels that land them and deposited on the specially prepared platform in front of the landing room. Here they are beheaded and sorted, placed in conveyers and, by means of an overhead railway, taken to the floor where they are packed in boxes with ice for shipment. They are weighed as they pass along on the railway. So expeditiously is this work carried out that they are placed in the boxes on occasions within five minutes from the time they leave the vessel. The facilities enable the company to

pack in boxes for the eastern market or any other part of the globe 30,000 pounds an hour from the fishing schooner.

The plant handles the greatest quantity of fish on the Pacific Coast. Last year out of a total of about 50,000,000 pounds of halibut that was handled on the Pacific, the Prince Rupert plant had to its credit 13,000,000 pounds. This fish is placed almost immediately, and in many cases without any delay whatever, in the express refrigerator cars of the G. T. P., and in that state shipped to the various points in the east, where the Prince Rupert halibut has become so famed. When it is taken into account that the port of Prince



T. H. Johnson, Manager.

Rupert lies so close to the banks, and the method of handling the fish (which arrive in so fresh a state) is of the most modern and expeditious character, there is little wonder that Prince Rupert has become synonymous with high quality halibut.

The company maintains branches in Chicago and in Vancouver. There are agencies in all the other principal centres in the east and along the coast, and in the distribution of the fish the same modern methods are followed as in connection with the packing. It has only been by such methods that the company has been able to handle the immense quantities of fish that it receives.

In connection with such a business as this, the ice of the establishment is a most important one. The cold storage is not only a centre for receiving fish that have been brought in from the banks, but, in addition, it is an outfitting centre for the steamers and gasoline boats engaged in this line of business. The vessels must outfit before leaving for the banks, and at the cold storage plant they are able to obtain practically all they need. They get their bait, their ice for preserving the fish until they get back to port, and their supplies of all kinds, for the company maintains one of the largest stores on the coast. In everything that the fisherman wants, from hardware and ship chandlery to beef and clothing, is carried. Nets, lines, and dories are obtainable here.

But, to return to the question of the ice, the plant has produced as much as 80 tons a day. The plant supplies all the needs of the establishment itself, and in addition takes care of the ice needed in the city of Prince Rupert. It supplies some of the other fish firms in the city, and is always prepared to take care of the needs of its own fleet, and all independent schooners that come. The company has a separate insulated ice storage, thoroughly piped up and connected with the main compressors. This storage has a capacity of 2,000 tons, which acts as a reserve supply for the plant. It is connected with the ice producing part of the main plant by conveyors, so that there is no handling by hand necessary. It is also situated so that it may be used in loading into cars as they stand on the siding. Everything is arranged to avoid delay and to economize in the matter of labor. The ice as it is made is lifted by derrick and sent in an automatic manner to whatever point it is needed. The ice, by the way, is all made from condensed water and is thus pure.

The ice is carried by gravity from the ice storage to any desired point about the plant. There are three ice crushers which supply the fish-packing shed, being delivered at different points where required. It is also delivered in the crushed state right in the storage quarters on board the fishing boats.

In the production of the ice, the company has in use two 125 ton Nordberg Compressors. The power for the plant is supplied by two 150 ton Babcock and Wilcox boilers, which use coal as fuel, having automatic stokers which facilitates the working. The company generates its own electricity, which is used throughout the buildings.

 THE Canadian Fish and Cold Storage Company operates three steamers of its own, the Carruthers, Kelly, and Foster. In addition to this it has nine schooners of large size, the Zibassa, Skugaid, Starratt, W. R. Lord, Fredelia 111, Phippen, all of Canadian register, and the Sitka and Sumner of American register. The company is, then, in the market for the catches of all comers, and takes care of the catches of a great fleet of independent schooners that come to Prince Rupert to dispose of their catches.

The company owns and operates its own cannery across the harbor from the main plant. This is equipped in the most modern way, also, for the canning of salmon from the Skeena River. It has a capacity of 40,000 cases a year. During the present year the Cold Storage has been successfully operating the English steam trawler system in these waters, the otter trawl. The Carruthers is being used in this work and brings in every few days its quota of soles and other small varieties of fish. It brings in up to 150,000

pounds a trip and is proving a decided success. This is the first time that trawling has been made a success on a large scale on this coast.

The company has to its credit the introduction of the long line system of halibut fishing on the Pacific. This is now being followed by all vessels to some extent at least.

Needless to add, the company has all the conveniences for the loading and the shipping of its products from the plant. A spur of the G. T. R. runs in among the buildings so that it is a simple matter to get a train load of fish dispatched from the place. It is loaded directly into the car and every facility exists for the placing of the ice in the chambers of the car from the roof. Adjoining the main building, which constitutes the cold storage plant, are other buildings, where the mild curing of salmon is carried on and where the smoking and other treatments, that go with the production of the excellent brands turned out by the plant, are carried into effect.

The plant of the Canadian Fish and Cold Storage is one that is a credit to the Dominion. It is not local in any sense, as its product finds its way to all parts of the continent. It is a connecting link between the great productive Pacific ocean and the continent of America. With the ever-increasing prices for meats there may be expected to follow an increased consumption of fish. The future of the trade in Prince Rupert is therefore bright and, while there will be transitions in the business in various lines, the demand promises to be largely increased. The wisdom of the promoters of the Canadian Fish and Cold Storage Company, therefore, in the placing of its magnificent plant here, is borne out more and more every day.

FISHERY NOTES.

With favorable weather conditions prevailing fishing operations were carried on energetically on both the Atlantic and Pacific coasts throughout the month of June.

The quantity of cod taken during the month is 29,000 cwts. greater than that taken in June last year, while the catch of haddock is 48,000 cwts. greater. Hake and pollock landings on the other hand are somewhat less than in the preceding June; also the quantity of herring landed is considerably less owing to the catch at the Magdalen Islands being smaller.

The catch of mackerel in June this year, however, is 60 per cent. better than for the same month last year.

The total catch of lobsters for the month is 134,392 cwts. In June, 1916, the catch was 180,671 cwts.

Since the opening of the lobster season on November 15th, until the end of June there were packed 136,135 cases, while 67,222 cwts. were shipped in shell. During the corresponding period last year 171,847 cases were packed and 93,758 cwts. shipped in shell.

This is the year in which the periodic "big run" of salmon occurs on the Fraser river and the canners there are preparing to handle the usual large quantities.

Spring salmon were only fairly plentiful in the Prince Rupert district, but Sockeye seemed to be abundant. Good catches of spring salmon were made in the northern parts of Vancouver Island.

The British Columbia halibut catch during June amounted to 36,853 cwts. against 6,693 cwts. in June of last year.

One fisherman belonging to Gloucester County, N.B., was drowned while fishing.

GAS ENGINE MAN JOINS AVIATION CORPS.

J. H. CLAYTON,
Secretary Standard Gas En-
gine Co., Oakland, Cal.

In these days of stern military necessity many an enlisted man is sacrificing his home and business life without a murmur and marching away to France to do his share of the fighting which his country needs him to do, but when a man voluntarily and through no military requirement passes up vital business interests because he is peculiarly fitted to aid his country and believes that his country should stand before all else, then we have a display of patriotism that makes us realize that the same red blood course through American veins as in days of old.

Examples of this sort we are hearing of all over the country and one of the most conspicuous of these cases is that of J. H. Clayton, the secretary of the Standard Gas Engine Co. of Oakland, Cal. Mr. Clayton became an officer of the Standard Gas Engine in January, 1917, and in addition to being secretary was also direct assistant to President Geo. W. Emmons in the management of the big manufacturing institution. Young, active, capable, and enthusiastic, his opportunities with the company were great and his career a promising one, and yet he did not hesitate to sacrifice this immediate future when America sent out the call for her sons to come to arms in her defense. Clayton has had much experience in aviation, and realizing the need of the country for trained men in this work, he immediately and without hesitation offered his services and was accepted. He took this step and his associates in the company encouraged his taking it despite the fact that the business of the Standard Gas Engine Co. for the present year is greater than ever before in its history and that the need of Clayton's experience and knowledge was very keenly felt at the home office.

Of course, the gap left by Clayton has been filled, and the business of turning out "Frisco Standard" engines for the fishing and work boat fleets of the world is going on apace, and Clayton will soon be on his way to France to do his bit, secure in the knowledge that the place which he left is waiting for him when he comes back and that his associates in the company are each and everyone of them behind him in the patriotic effort he will make for his country.

SPECIAL LOBSTER SEASON.

Ottawa, July 26. — An order-in-council was passed today providing for a special lobster season this year for northern New Brunswick and Prince Edward Island, from August 11th to September 15th. The usual lobster season runs from May 25th to July 10th. The trial of a special lobster season this year is with a view to testing out the theory that the later open season would give better results in quality and character of catch.

ONLY COST PREVENTS POSSESSION.

MARGARET McLAREN.



"ONLY the cost, prevents me installing a motor," is what every fisherman now motorless says. But, argues the agent, "Why not have one anyhow, if we give you time to pay for it?" The fisherman, thoughtfully aware of the extras, such as gasoline ever soaring, as well as the mounting prices of foodstuffs, shakes his head. "No," he says quietly, "I can't buy now." "But," persists the agent, "You would get more fish if you had a motor, because you could, without fear of not getting back, go out to the far grounds. and were there no wind, you need not wear yourself out rowing, and so on, as we all know a persuasive agent can talk. The fisherman, however, has a holy fear of debt. Perhaps he has built him a house and wants to pay for it or has some undefined idea that if he gets the motor he will not be anything else but worried as to whether he may meet, as they fall due, the notes given for purchase of a thing most urgently needed in the fishing industry, an industry that is of vital necessity at this time to our country. The discussion as to whether or not motors will be purchased, resolves itself into a hot argument as to the advisability of petitioning the Government for the purpose of having the bounty money taken for the purchase of motors, and it seems this is really a most sensible idea to which no thoughtful person could possibly object. The idea would be to allow any man who applied for a motor to obtain one, his bounty being turned over to the Government for a certain number of years, and all of those not desirous of having motors, but who would leave their bounty with the Government for this most patriotic purpose could obtain thereon a certain rate of interest. The Government, by purchasing such a large number of motors, could get greatly reduced prices, and also a fixed rate of repairing could be agreed on accommodating of course, the cost of labor and material. The fisherman, also if he wished might pay as he could for the motor, without having the nervous feeling of debt incumbrance. In which case, if he had paid his obligation to the Government, he might draw, or leave on deposit, that small bounty, which in the aggregate is a considerable sum. Should this be obtained, the increased business that would be the result in all channels connected with the fishing industry, would cause a sort of awakening in the trade, which, in those times of necessary greater production, would be most acceptable to the interest of our great country,

Canada! Land of the Maple,
Birthplace of Gallant and Brave Men.

FORTUNES MADE IN ONE NIGHT'S CATCH.

Says the St. John Telegraph of July 26:

There has been a large run of sardines in the two local weirs for the last two nights. Tuesday night, July 24, Alexander Logan caught 18 hogsheads and these sold at \$40 per hogshead. On July 23 and 24, Alexander Sillipant and partners netted 160 hogsheads and sold them at the above price, realizing \$6,400. It is reported from all the weirs that the sardines are being taken in exceptionally large quantities, although weirs at the mouth of Courtenay Bay have been getting the best of it.—Eastport Sentinel.

D. Hatton Company, Montreal

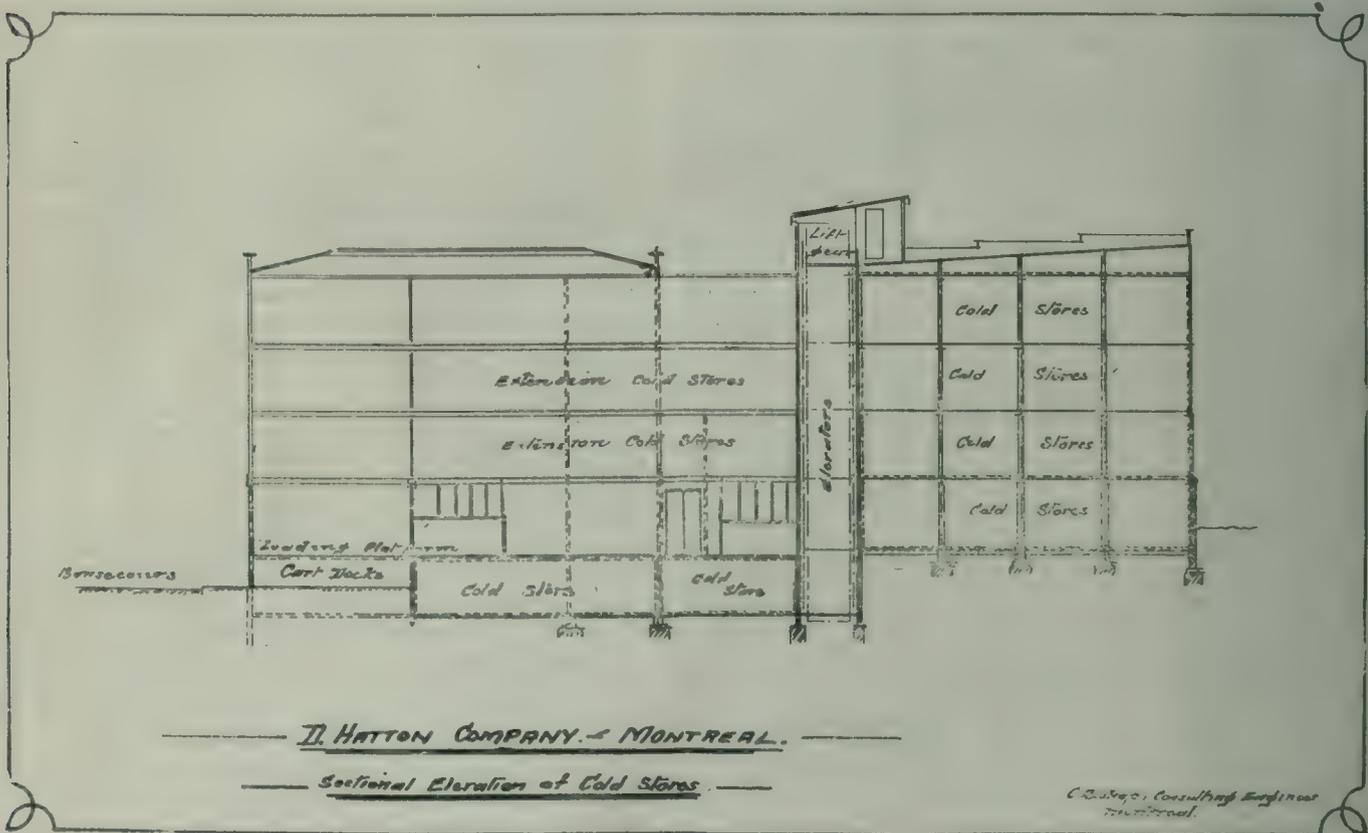
Established 1874.

The well-known and old established firm of D. Hatton Company of Montreal has carried out extensive alterations and improvements to their Montreal premises on Bonsecours Street, which will enable them to cope with their ever increasing business. The premises have been entirely remodelled, one of the chief items being the installation of a duplex Refrigerating plant with the necessary Cold Storage building, which will ensure perfect preservation of both fresh, iced, and frozen stocks and guarantee a large and varied storage to hand.

The Refrigerating and Cold Storage equipment comprises the new building shown by the illustration, which also gives the general arrangement of their premises and property. The Cold Storage

by the well-known York Co. and was supplied by the Canadian Ice Machine Co., Ltd. The Compressors are of the Vertical Enclosed-Twin type, each driven directly from a Motor. Double-pipe Condensers are fitted to work in conjunction with a Water Cooler upon atmospheric evaporation, so that not only will great economy of water be effected, but, in the event of temporary stoppage of water supply, the plant is quite independent and such stoppage will not necessitate shutting down the Machinery, and the temperatures within the Cold Rooms will not be seriously influenced by any such temporary shut down of water, which frequently happens in a growing City.

As before stated the Plant is really in two units, each complete and independent, so arranged that any



has been designed not only to handle the various kinds of fish, but to give and maintain steadily, the various degrees of temperature most suitable for these same kinds and as the temperatures range from about 40 degrees above to 5 degrees below zero, or even lower, detail rooms were necessary.

The Cellars are also suitably cooled and fitted for the conservation of wet fish, barrelled stock, oysters, etc. and are served by the two Elevators shown, which Elevators also serve the Cold Storage rooms in the new Building.

The Refrigerating Machinery is in two distinct units and is upon the Ammonia Compression principle, cooling by the direct expansion system and working with a 25 ton flooded Accumulator. The Plant was made

accident to the one plant in no way causes trouble, as the stand-by plant can at once be switched on. This gives a safeguard against accident and guarantees steady temperatures; as each plant is fully competent to deal with the load. Furthermore this arrangement, although more costly in first place, has a most important advantage apart from the above duplication. This is contained within the method of operating by means of two units and the facilities such enables one to obtain. For example:—

In the event of a very heavy consignment being received in a condition requiring prompt cooling of the whole load, the two units can be at once put to work and the complete stock be quickly overpowered by the

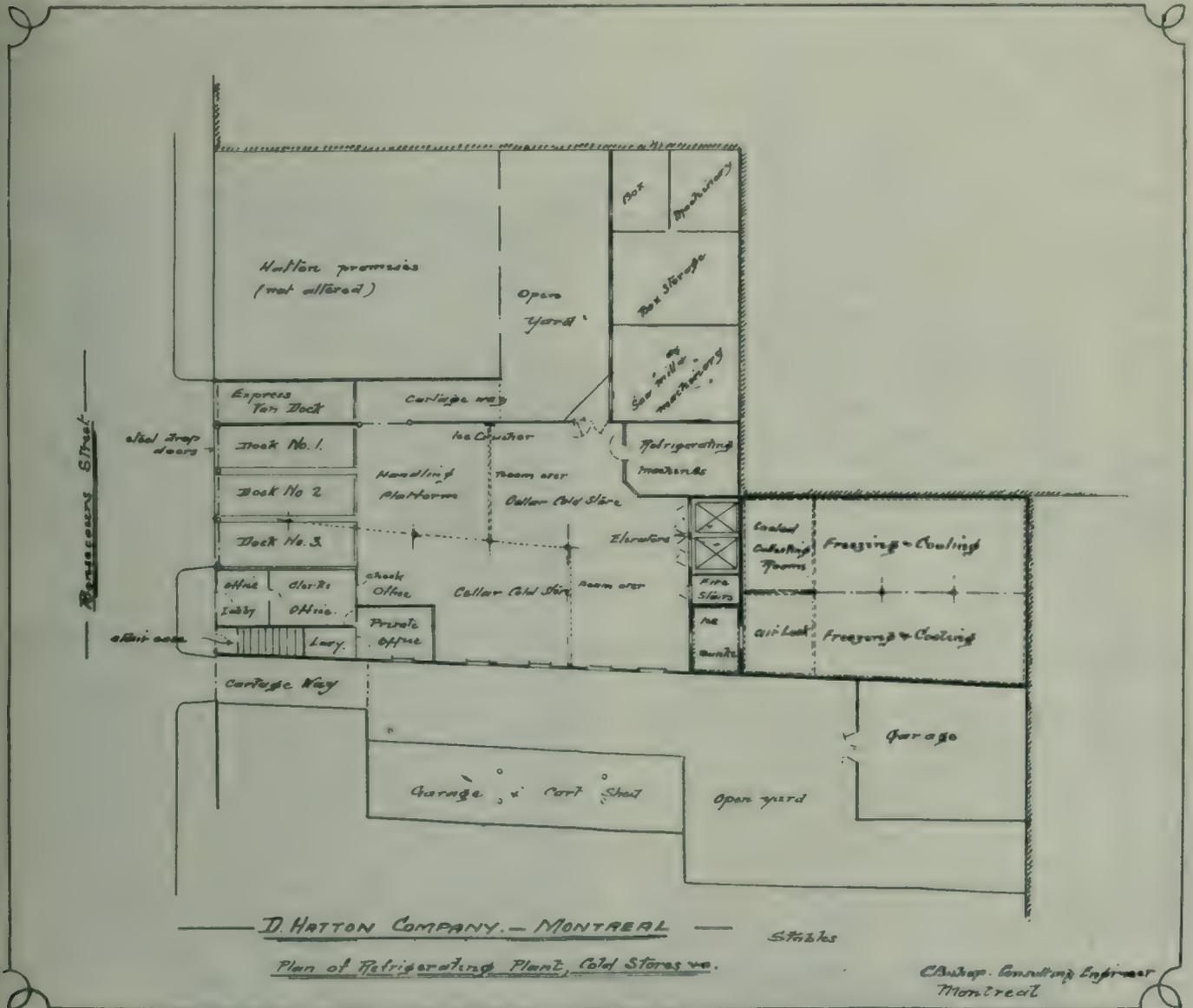
extra refrigerating capacity available. When this is accomplished one of the units is shut down and the other then steadily and easily maintains the temperatures obtained and thus any injury caused by slow cooling is prevented.

Again: another advantage is gained, as by running one unit on the duty of merely holding steadily a temperature already secured a small plant run for a longer period gives more satisfactory results than a larger machine run for a shorter period. In the latter case the temperatures are naturally brought lower than is really necessary in order to gain some margin against a rise when the machine is stopped.

advantages and altogether the arrangement fully repays the extra first cost and the somewhat larger Machine required.

Each of the four floors of Cold Stores are fitted with air locks which are made larger than usual as they are cooled sufficiently to act as collecting rooms to enable goods to be gathered together ready for shipment whilst under cold air treatment and this ensures goods being sent out in good condition.

The hard Freezing is carried out upon the first floor the cleaned fish being placed upon trays which slide upon horizontal shelves of Freezing coils supported by steel frames as usual. The pans are of special kind as



This amount of leeway or factor of safety may be misjudged and the stock adversely affected by such and in any case it is an established fact that a steady temperature is one great essential to good results. By running a small unit for a longer period however it is easily understood that the amount of rise or difference in temperature between the air in the rooms and the actual stock is materially reduced and thereby the risk of judgment also: as a direct result the temperatures are more reliable and subject to considerably less variation. This division of duty has other real

it is found that better results are obtainable with different materials according to nature of stock. The arrangement of Freezing connections has been given attention the cooling being so adjusted, regulated or tempered, as to perform the freezing process slowly and thoroughly resulting in best possible stock.

The necessary glazing equipment is being fitted for long shipping routes or other cases where 'air seal' is necessary.

A complete de-frosting equipment guarantees that the freezing and cooling pipes and surfaces are kept

efficient and sweet and ample sized trapped drains in concrete floors ensure a maintenance of sweet and sanitary conditions.

The Cold Storage Building is divided by insulated partitions into the required number of separate rooms for the different kinds of fish and various temperatures. The insulation which was carried out by the Armstrong Cork & Insulation Co. of Montreal is entirely Nonpareil compressed sheet cork, erected in Portland cement or asphalt as necessary, the interior finish being Portland cement plaster painted white. This in conjunction with the concrete floors, and skirting gives a water-tight, fire-proof and sanitary storage.

The whole is lighted by an up-to-date Electrical equipment and made as complete as is possible. Small special doors upon each floor give access to the Cold Rooms and these are fitted with locks. By these means the Proprietors are able to make personal and regular inspection of the goods without operating Elevators, interfering with the working, or opening main doors thus exposing goods to injurious draughts of warm air.

Automatic self-closing, fire-proof doors isolate the Cold Storage from the main Buildings and safeguard the valuable stock.

The present offices have proved inadequate for the business being done and same are being removed and enlarged. The cellars also are being over-hauled, new concrete floors and draining being laid and the remainder of premises put into good order.

To facilitate cartage and expedite delivery, which has hitherto been a great handicap, the whole frontage has been remodelled and three full length Cart docks are being built for heavy Motor Lorries and Railway Trucks and Rigs and in addition to this a fourth Dock for light carts and express service is being arranged as shown in illustration.

These improvements in conjunction with the Company's fleet of Motor Lorries and Express Cars will guarantee prompt and rapid delivery.

A new building is to be erected which will carry a saw mill and other machinery for the manufacture and repair of Fish Boxes and also for storage of same, and will contain the other equipment necessary as well as a store of crushed ice.

An Electrically driven Ice crusher has been installed which is mounted upon a moveable truck so that every box is well iced before being sent out.

Great care was necessary in designing these improvements as not only had the work to be none in shortest possible time with the minimum amount of disturbance to the present business, but the present buildings, having to be left intact or utilized as far as ever possible, entailed another handicap. The present state of affairs made the delivery of steel work and material a difficult matter to say nothing of the labour situation.

The plant was designed by M. Chas. Bishop of Montreal. Consulting Refrigerating Engineer who is an Expert in this branch of Engineering and has carried out such work in many parts of the world.

Messrs. D. Hatton Company naturally expect and certainly deserve an increased business as a result of their heavy investment and enterprise and as they intend to handle solely first class stock, shipped promptly, in best possible condition, taken from a large and varied stock maintained under best conditions of temperature and sanitation, there should be no doubt concerning their expectations being fully realized.

The plant although of moderate size, as Fish plants go, is still probably the most complete and up-to-date equipment of its kind in the Dominion of Canada and it has been erected with the intention of extension in the near future.

Consumers Cordage Co., Limited, Almost a Century Old

Every fisherman knows "Lion Brand" Cordage, manufactured by Consumers Cordage Company, Limited, but few know that nearly a century ago—or to be exact, 1825, this firm was making hawsers, ropes, lines and twines at a plant located in Montreal near their present large up-to-date factory.

The cut reproduced is taken from an old painting showing "The Accommodation," being hauled up the St. Lawrence River through St. Mary's current. This was the first steamboat in Canada, in fact, in the

world, and was built and operated by Hon. John Molson. "The Accommodation" used rope made in the Company's first plant.

The Montreal plant was established in 1825 by the late Mr. John A. Converse, and has grown from modest beginnings up to its present large dimensions as shown in the accompanying photograph.

The Dartmouth plant was established in 1868 by the late Hon. W. J. Stairs, of the well known Halifax hardware house, William Stairs, Son & Morrow,



Montreal Mill Operated Since 1825.



Dartmouth Mill Operated Since 1868.

Ltd. It was then known as the Dartmouth Rope-work Co., but twenty years ago was absorbed by Consumers Cordage Company, Limited.

Both factories specialize in the various cordage requirements of the fishing industry from the smallest lobster marline and rope to the largest hawsers or



W. A. C. HAMILTON,
Secretary and Sales Manager.

cables used on the bank fishing vessels, and mooring lines, tow lines, etc., of the largest ocean liners or ships of the navy.

Many fishermen have seen the old-fashioned method of rope-making, i.e., the rope walk. Although the principle is the same, the method employed by Consumers Cordage Company, Limited, Montreal plant, considerably lessens labor. This work is now all done by powerful up-to-date machinery, which will make rope of uniform strength varying from one-half inch in circumference up to immense ropes of twenty inches

circumference. For larger sizes which may be better produced by the old-fashioned method, a rope walk is now maintained at the Dartmouth plant.

In order that no rope may leave the factories below the standard of quality which has been decided upon, a rigid system of inspection is in force from the time the raw material is purchased until the goods reach the buyer. This has resulted in such a uniform and reliable product that the Company has felt a steady and increasing demand for their cordage which results in continual growth. Just at present a large addition is in course of construction at the Montreal plant, and at Dartmouth the entire plant has recently been equipped with electric motive power in order to supply the increased demand caused by the continued growth and the revolution in ship-building throughout Canada.

FLESH OF WHALES SAID TO BE MEAT AND NOT FISH.

Government Experts Recommend It Highly for Food

Whale meat and similar sea meat for food purposes are advocated by the U. S. Bureau of Fisheries, according to an announcement made by the Department of Commerce. The announcement states:

"Whales and porpoises are mammals, like cattle and sheep, and their flesh is 'meat' and not 'fish.' In texture and appearance, it resembles beef, though the color is darker red, and the flavor is closer to that of meat than any other. It is devoid of all fishy taste. It is probable that it will soon be obtainable fresh, corned and canned, and it is recommended to those who have the opportunity to purchase it.

"During May, an enterprising whaling company placed whale meat on the market in Seattle, Washington, and Portland. The product met with a ready sale at ten cents a pound, and was immediately placed on the menus of hotels and restaurants under its proper name.

"Two of the Bureau's employees dining in the cafe of a western hotel found the following on the card: 'Barbecued Alaska black cod and drawn butter' and 'sperm whale steak and current jelly.' One ordered the whale steak and one the cod, and each found his dish very palatable. Incidentally it may be said that the 'black cod' is another of the food fishes, the use of which this Bureau has been urging and with success.

"During the course of the dinner the two gentlemen heard several orders being given for whale steak, and inquired of the waiter whether there was much demand for the meat. He replied that there was a tremendous call for it and that they had just served the last portion. The waiter said that the whale meat cost ten

cents a pound, and gave as his opinion that if a supply could be maintained it would become as popular as beef. The steaks are served fried, but there is no reason why the meat should not be cooked as pot roasts and the like.

"Whales are taken at several shore stations on the Pacific Coast, where the blubber (fat) is rendered for oil and their bones and flesh used to some extent for fertilizer, while their skins appear to be adapted for tanning into leather.

"As these stations take a considerable number of these huge animals, each furnishing about five tons of excellent meat, it is evident that a large quantity of this valuable food has been going to waste, and the fishermen have been converting into fertilizer a product that has probably ten times greater value to them when sold for food.

"Whaling on the Atlantic side, once the greatest whaling region, has declined greatly, but there are still some whales taken. There is no difference in the food value of the Atlantic and Pacific whales.

"Porpoises are abundant on our coasts, and there is a regular fishery for them at Cape Hatteras, where they are valued principally for their oil and to some extent for their hides. Canned porpoise and dolphin meat, recently submitted to the Bureau of Fisheries, was favorably regarded by all who tasted it."

PRINCE RUPERT NOTES.

The amount of fish landed at the port of Prince Rupert during the month of June reached a very high total. The beginning of the salmon season in earnest in the way of canning had its effect upon the total receipts swelling it to well on for four million pounds of fish of all sorts which included the salmon landed at the canneries along the Skeena River just outside the city of Prince Rupert and which are tributary to the city directly. This does not take into account the salmon taken at the other canneries like Rivers Inlet and the Naas and which are also tributary to this place, but to the same direct extent as the Skeena which empties into the salt water practically at the entrance to the Prince Rupert harbor.

The month was a good one in the line of halibut which accounted for well on for two and a half million pounds. The amount landed was 2,390,000 pounds.

Next to the halibut the salmon came into prominence with 768,423 pounds including the canneries of the Skeena as well as the fish of that variety landed for use in a fresh and frozen state. Of this amount there was actually landed in Prince Rupert 155,560 pounds.

The number of salt fish being landed as a result of the trawling operations of the Canadian Fish and Cold storage almost exclusively is becoming an important part of the fish landings each month now. Included with this is the whiting a small fish resembling the cod in some respects which cannot be included as a flat fish but which is caught for the most part in the trawling operations. Of the whiting there were landed during June, 932 pounds. In the line of flat fish of the sole type the figures for the month were as follows: brille 213,941 pounds; soles 7,834 pounds; witches 540 pounds; flounder 51,552 pounds; skate 18,129 pounds.

Cod stands at 171,293 pounds landed during the month of June.

The record for the month for the whole of the fishing at the port is therefore over 3,622,700 pounds.

O. H. Nelson.

SOCKEYE SALMON.

Expected big run of Sockeye Salmon has not materialized—Looking to the full moon for the full run—Reasons advanced for the shortage—Grayfish packing increasing—Dry weather is hurting the fruit crop.

Seattle, Wash., August 10, 1917.

Salmon.—Gloom hangs in great black gobs over the Puget Sound sockeye salmon canning industry. This is due to the fact that the expected run of sockeye salmon has not as yet materialized in the proportions that had been expected. The first run of sockeye was heavy and hopes of trapmen, seiners and cannery owners ran high. With the first catches out of the way, the fishermen and canners commenced to wait for more fish, and so far have been disappointed. One day last week the canneries at Bellingham received less than 50,000 fish, where five times that number should have reached the city. A. W. Deming, of the Pacific American Fisheries Company's big plant at Bellingham, says that the cannerymen are hoping against hope that the much-looked-for run will yet materialize. The veterans are hoping that the run will come on strong during the full of the moon. Indians and old-timers declare that the moon does actually affect keen competition for the sockeye salmon that have been brought in to the canneries. For a few days as high as 75 cents per fish was paid by canners. Other canners purchased fish by the hundreds and were willing to take ninety fish and pay for a hundred. The situation became so bad that a meeting was held with the seiners, and as a result the latter agreed to accept a price of 30 cents for sockeyes for the balance of the season.

The principal reason assigned for the poor run is that four years ago, when the fish were crowding up toward the Fraser River to spawn, an earth slide in that river prevented the fish from getting up to the spawning grounds. Four years ago there was a lot of talk about this earth slide, and the prediction was made that the failure of the fish to spawn would affect the 1917 run. Experts declare that if this was the case, it will take a good many years to get the supply back to normal.

From Alaska come fairly encouraging reports. A J. Alexander, superintendent of the Pacific American Fisheries Company's cannery at Hoonah, has reached Juneau, Alaska, and reported that the biggest run of salmon ever known in South-eastern Alaska was in progress when he left the cannery. He said that all the canneries in that section were taxed to capacity. Most canneries, he said, were short of help, and are for that reason unable to box up their stock for shipment as rapidly as they had planned.

On the other hand, discouraging reports were brought to Bellingham this week by the steamer Windber, owned by the Pacific American Fisheries Company. This vessel arrived from Port Miller and other way points in Alaska. The vessel stayed three weeks at Port Miller waiting for the fish to run. The run at that point was reported almost a complete failure.

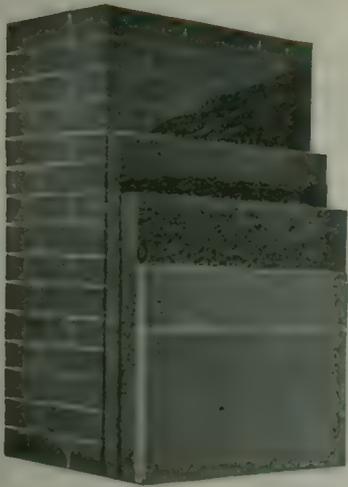
Parent—Do you know the parables, my child?

Johnnie—Yes, sir.

Parent—And which of the parables do you like best?

Johnnie—I like the one where somebody loafs and fishes.—Philadelphia Record.

Cold Storage Insulation



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Hawkesbury, N.S.

LOCKEPORT COLD STORAGE COMPANY,
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M. DOYLE FISH COMPANY, Toronto, Ont.

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MONTREAL, Que.

Sample and catalogue free on request.

On Oyster Culture

No. 1.—In Canada.



OYSTER culture has been receiving some attention in Eastern Canada during recent years, but it cannot be said that very much has been accomplished in this direction, more especially if we consider how we might have profited by the experience of other lands. Oyster culture is a very ancient science, business, industry—whatever you choose to call it. In Pliny's natural histories, we read that the Ancient Romans in various parts of their vast empire had made considerable progress in oyster culture; maintained great oyster parks in which by artificial means—practically the same as those employed today—they gave a new lease of life to larvae that in the natural order would have been destroyed, improving the species, and fattening the individual till it was fit to adorn the table of the most fastidious senator of Rome. When the German barbarians of the period overthrew the Roman Empire the science of oyster culture was lost to the world of Europe. In the middle ages oysters continued to be a delicacy much appreciated, but nature was given a free hand in the matter of their propagation. Evidently nature attended to her task with commendable industry, for as late as 1681, the opinion prevailed, in France at any rate, that the oyster beds around the coast, were inexhaustible. In that year an ordinance was passed, imposing certain restrictions on the taking of mussels on various parts of the French coast. Apropos of this Valin, an old writer on the fisheries, observed in effect: "The restrictions are only of interest to the fishers of mussels; fishers of all other shell-fish may carry on without fear of exhausting the bottoms." Nevertheless the French oyster beds, prolific as they were, gradually became depleted; oysters became a rarity, even upon the tables of the rich. The French Admiralty, and provincial parliaments adopted regulations intended to arrest this depletion, but they were never applied with sufficient vigor, and the destruction of the beds continued. Only the lack of transport facilities to the markets, prevented the complete destruction of the oyster beds.



IN 1849, the French government began to consider seriously the question of the artificial propagation of oysters, and by 1852 the Ministry of Marine was carrying on experiments on an extensive scale. Many of these experiments were from a financial point of view a failure; but together they helped to increase the stock of technical knowledge necessary to solve the problem. By 1863 these experiments had indicated the main lines upon which the problem must be tackled, and since then the development of the industry of oyster culture in France has been continuous and regular.

In more recent years this development has been of an eminently satisfactory character. In 1895 the French oyster yield was valued at 10,000,000 francs; in 1913 it had reached a value of 29,000,000 francs. The importance of artificial culture may be judged from the fact that while in 1912 the value of the oysters taken from the natural beds was 1,200,000 francs in round numbers, the value of the yield from cultivated beds was nearly 28,000,000 francs.

It is worth noting, as indicating the ability of the oyster to adapt itself to new conditions, that the increase in the yield of the oysters of France is in con-

siderable measure due to the introduction of the Portuguese oyster. This introduction was of a fortuitous character. In 1866 a small steamer, carrying some Portuguese oysters, was detained at Bordeaux. The oysters began to go bad. The master was ordered to go outside and jettison the oysters but instead of doing so he dumped them in the harbor. Some of the oysters were alive; they pursued their functions, multiplied, formed an enormous bed, and spread along the coast. In 1895 the harvest of their descendants was valued at 2,000,000 francs; by 1913 the yield had attained a value of 11,000,000 francs. These oysters received little consideration in the market for years, but of late their sale has steadily increased. They are said to lack the flavor and nutritive value of the native oysters, but tend as the years pass to approximate them.



IN England, France and Holland, wherever oyster culture is carried on, strict attention is given to the problem of maintaining the salubrity of the parks, and the wholesomeness of the oysters. As the ancient Roman Pliny in his natural history studies noted, oysters love frequent baths of sweet water. Only in brackish waters do oysters grow large and fat, and of a flavor to tickle the palate of the epicure; those reared in waters of a high degree of salinity are usually small and not very tasty. Oyster parks for maturing purposes are located near the mouth of a river, or in bays, into which rivers and brooks discharge fresh water in sufficient quantities to produce that condition of brackishness necessary to make the young oyster eager to grow up and go adventuring among the haunts of wealth and beauty in cities of gaiety and colored lights. These streams of fresh water carry to the habitations of the oysters matter of various kinds. Occasionally the oyster may absorb microbes which do not agree with his system; if raised from his bed in this condition he may transmit the microbes to the consumer, who in his turn becomes sick. That this is a possibility there is no reason to doubt. At the same time extensive researches made in England and France show that the number of cases of illness arising from eating contaminated oysters, is, as compared with the total consumed every year, infinitesimal. Besides it does not follow that the oyster acquired microbes while on the sea bottom; it may have been contaminated while in the wholesaler's or retailer's hands, through being washed with impure water or kept in unsanitary receptacles.

However, the question of conserving the health of oysters is a matter of first importance, and it has become the object of state concern in various countries. A long time ago Holland organized a system of sanitary control of oyster culture parks. This control involves frequent bacteriological examinations of oysters taken from the parks, and analysis of the waters that flow over them. When the oysters and waters are found to be in a satisfactory condition, a certificate to that effect is given. Before buying oysters from any park, wholesalers require the production of the certificate of purity. When oysters are found to be in ill-health, the state officials are empowered to enforce the adoption of such measures as they consider necessary. These measures depend upon the degree of pollution of the park. It is seldom or never necessary to destroy the oysters. But the operator of the park may be compelled to remove all the oysters suspected

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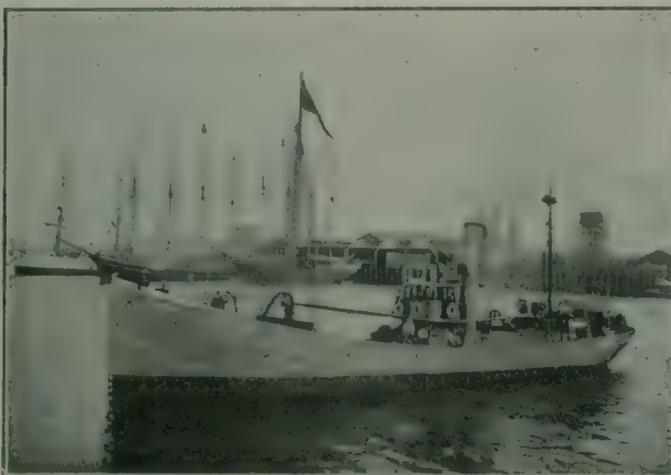
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of contamination, and replant them on bottoms where pure seawater is found. In pure sea water oysters soon throw off the germs absorbed from polluted fresh water streams. Indeed oysters taken from contaminated areas can by treatment with pure water be made ready for the market without fear of causing sickness: but this remedy is not encouraged by state authority or the trade. The more stringent precautions are generally practised. Cases of sickness due to eating oysters may lead to sensational articles in the press, and the trade may suffer severely. In France, for instance, though the demand for native oysters has shown a steady increase, the demand for imported oysters sometimes shows violent fluctuations.



IN 1915, Great Britain adopted new regulations designed to assure improved sanitation of oyster parks. It is provided and ordered that local health authorities shall make frequent examinations of oyster parks in their district, as well as of oysters placed on sale. These authorities, even if they cannot prove contamination, may, if they think there is a possibility of danger, prohibit the sale of oysters, until they have been transplanted in pure water for a period of at least 15 days. These local boards are instructed to attach more importance to topographical considerations and epidemic possibilities than to the results of bacteriological analysis. They are required to take prompt action on complaints coming from other districts that oysters coming from parks directly under their control are not in a satisfactory condition.

The British system of regulation has been subjected to some criticism by the trade. The main objection seems to be that it has the inconveniences inherent in English legislation in general—it leaves too much to local authority. Appeals from the decisions of the local boards may be made through the local government board—which probably knows little of oyster culture. At the annual meeting of the representatives of the fishing industry in 1915 the new regulations were vigorously discussed, and the demand was made that the Board of Fisheries should take over the sanitary control of oyster parks. The Board already has a large personnel of technical experts, and it was argued it could establish a uniformity of conditions impossible under the system of control by local authorities. Lord Selborne, chairman of the Board of Fisheries, was present, and stated that the regulations were of a provisional character, and that it was intended to make the question of the contamination of oyster parks the subject of a new bill, dealing with the whole matter in a comprehensive manner.

The Holland system which provides for greater centralization of authority and more uniformity of action is said to have produced excellent results, and it is along similar lines the French are moving. Their task, however, is not easy, for whereas in Holland large concerns planting oysters on an extensive scale are the rule, in France small concerns, very often individuals, carry on oyster farming.

Some years ago the scientific consultative committee of the French Fisheries department took up the question of the sanitary regulation of oyster culture. They laid down two principles. The first was that as it is exceedingly difficult, if not impossible, to determine the precise degree of contamination of any park, all parks should be considered as contaminated, or susceptible of contamination. As a consequence of this

principle it was recommended that all oysters taken from the parks, should before being placed on sale be submitted to a bath of filtered water—pure salt water either natural or artificial—in order to give them an opportunity to rid themselves of any species of bacilli.



THE second principle, based on the old adage that an ounce of prevention is better than a pound of cure, was that the solution of problems must be found in constant surveillance of oyster culture, and by consequence, the creation of a permanent system of sanitary control. The committee expressed itself satisfied that the great majority of existing parks were perfectly healthy; recommended that operators of parks having any defects should be at once compelled to remedy them; urged that the few parks, known to be contaminated beyond remedy, be completely suppressed; objected to the granting of any concessions in waters of which the salubrity was at all doubtful. The committee suggested a system of control. It proposed that local commissions, composed of medical or other hygienic authorities appointed by the local prefect, should make frequent reports on the condition of existing parks, and examine and report on the condition of the water and bottoms where application to establish new parks was made. It was proposed that all such reports and conclusions should be reviewed by a special commission of the scientific consultative committee before action was taken. The hope was expressed that the study of the reports and conclusions of the local authorities, compared and co-ordinated with the conclusions of the servants of England, Holland and other countries, would result in a formula, definite and precise, relative to the conditions essential to the culture, successful and sanitary, of oysters.

In compliance with the recommendations of the scientific committee, the Ministry of Marine (which as in Canada embraces the Department of Fisheries) issued in 1913 instructions that all applications for concessions for proposed oyster parks, must be accompanied by reports made by the local officials of hygiene, and later the prefects of the Maritime Departments were ordered to see that the hygienic authorities made proper investigations before drawing up their reports. Since then this procedure has been scrupulously followed. Moreover the scientific committee has been entrusted with the duty of determining the methods of examination, and of reviewing all reports. This committee, although not possessed of legal authority exercises by virtue of its consultative character state powers; it really decides whether or not the state will grant concessions to would-be operators of oyster parks, and its recommendations in regard to existing parks are promptly carried out.

In order to supplement the activity of the state in this connection, the French oyster farmers and dealers have formed an association which working in conjunction with the public authorities attempts to do for the oyster industry what Lloyds does for the shipping industry. Its object, as stated in its act of incorporation, is to determine on scientific lines the condition of installation, maintenance, improvement, and control of establishments for breeding and growing oysters and other shellfish, and to exercise supervision over the transportation, storage and sale of such products of the sea. Making its debut in an advisory and educative capacity, the association soon became an organ of sanitary control, and devoted its main efforts to the

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Please send him.....stem pipe, and bundle of cleaners.
(straight or curve)

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(dealer's name) (street, town and province)

NOTE.---If your dealer can't supply you with T & B, just fill in his name in space above. Attach express or postal note for \$1.20, mail to us, and we will send you the tobacco, pipe and cleaners.

The Tuckett Tobacco Company, Limited, Hamilton, Ont.

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assuring of the production of healthy oysters. Organizing an expert technical staff, it established a system of classification of oyster parks similar to Lloyd's register. Members submitting their parks voluntarily to the supervision of the sanitary service of the association are granted a certificate and a classification according to the condition of the park. Any improvement noted by the inspectors, after bacteriological and other examinations may mean a higher classification; deterioration may mean a lower class. Just as a ship

to keep up her classification in Lloyd's register must satisfy more stringent requirements than is necessary to satisfy the government inspection, so the oyster parks, in order to keep up their classification in the association's register, must satisfy requirements more stringent than is necessary to secure a certificate from the state authorities. Of course the advantage is obvious; oyster parks in the A-1 class need not worry about markets.

Canada's Fisheries for July, 1917

While the month of July was free from storms, continued fog on the south and west coasts of Nova Scotia and in the Bay of Fundy hampered operations. Notwithstanding this drawback the landings of cod and haddock in the counties of Guysboro, Halifax and Lunenburg were 45,000 cwts. greater than those for July last year, and in the counties of Shelburne, Yarmouth and Digby they were slightly greater.

Round the island of Cape Breton weather conditions were more favorable, fish were abundant on the fishing grounds, and with a plentiful supply of bait operations proceeded steadily in most sections throughout the month, resulting in an increase of 10,000 cwts. in the catch of cod and haddock.

Compared with July last year the landings of the Caraquet and Shippegan, N.B., cod fishing fleet for the month were rather less. On the Gaspé coast and at the Magdalen Islands the cod catch was considerably less owing to scarcity of fish and somewhat unfavourable weather.

The catch of sardines in the Bay of Fundy resulted

in an increase of 10,000 barrels over the catch for July last year.

Salmon were scarce during July in the Margaree River, N.S., and the Mirimachi River and Bay, N.B.

Since the opening of the lobster season on November 15th, until the end of July, there were packed 147,954 cases, while 69,255 cwts. were shipped in shell. During the corresponding period last year 181,913 cases were packed and 94,209 cwts. shipped in shell.

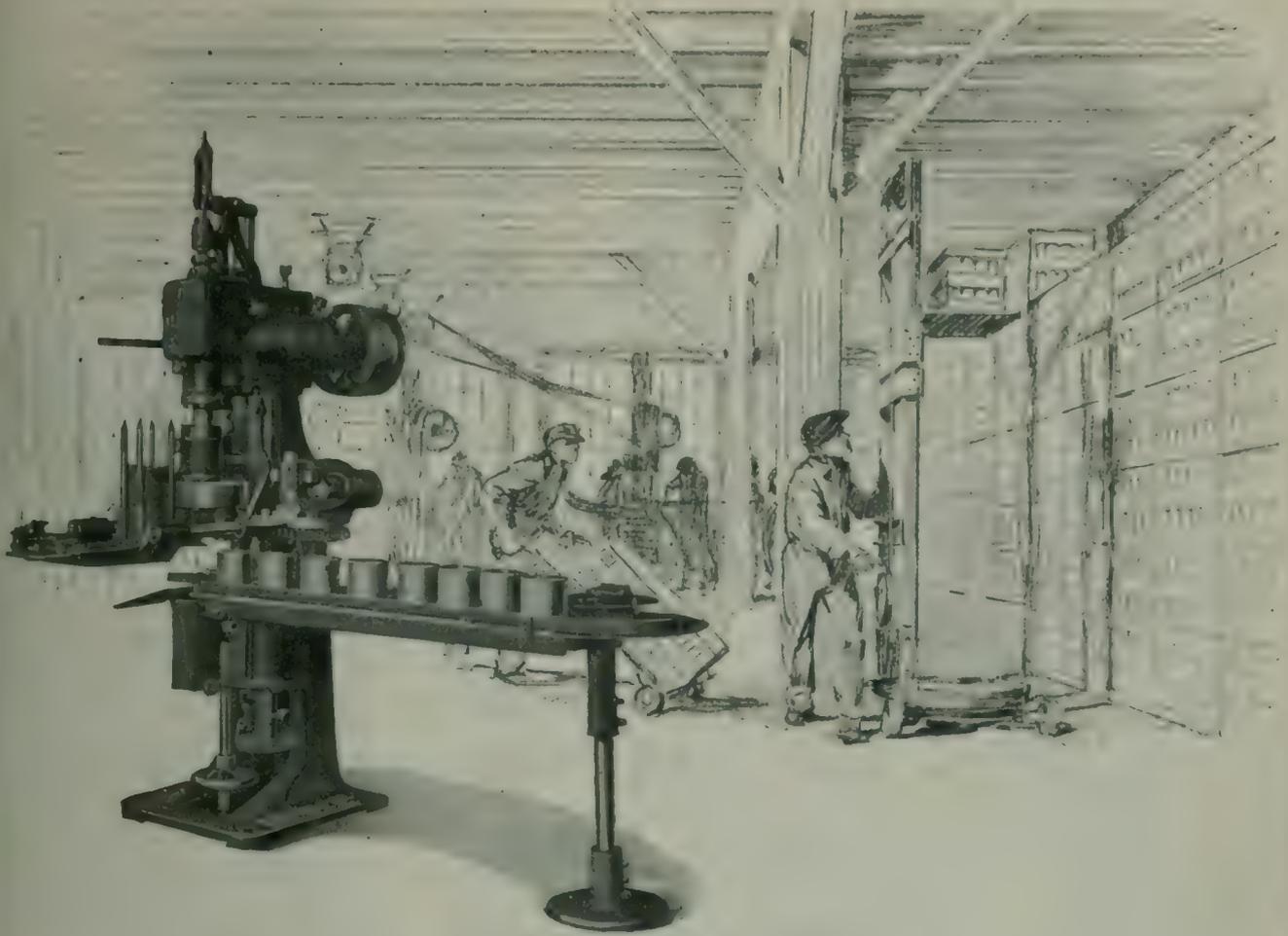
On the Pacific Coast fishing was carried on under favourable weather conditions. Good catches of salmon were made by the traps at the south end of Vancouver Island; also in the Fraser River districts, and indications point to the recurrence of the usual "big run" which in the ordinary course happens this year. The salmon fishing results in the northern district were very considerably better than for July last year. The landings of halibut, on the other hand, show a decrease of over 30 per cent. when compared with those for the same month in the preceding year.

One fisherman was drowned in the southern district of British Columbia.

Summary of the Quantities and Values of all Sea Fish caught and landed in a Fresh or Green State; and an estimate of the Quantities Marketed, or intended to be marketed, fresh, dried, pickled, canned, etc., in the WHOLE OF CANADA, for the MONTH of JULY, 1917.

Totals for the Month of JULY, 1916.

Kinds of Fish.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.
	Quantity.	Value. \$		Quantity.	Quantity.	
SALMON, cwts.	215,389	1,241,828	.....	174,900	885,665	.....
Do., used fresh (or frozen) cwts. . . . .	.....	.....	24,077	.....	.....	18,550
Do., canned, cases . . . . .	.....	.....	220,194	.....	.....	171,835
Do., smoked, cwts. . . . .	.....	.....	171	.....	.....	72
Do., salted (dry), cwts. . . . .	.....	.....	.....	.....	.....	.....
Do., mild cured, cwts. . . . .	.....	.....	4,015	.....	.....	7,903
Do., pickled, cases . . . . .	.....	.....	24	.....	.....	22
LOBSTERS, cwts.	25,212	106,956	.....	20,400	95,076	.....
Do., canned, cases . . . . .	.....	.....	11,588	.....	.....	9,966
Do., shipped in shell, cwts. . . . .	.....	.....	2,040	.....	.....	451
COD, cwts.	265,705	675,683	.....	305,375	545,177	.....
Do., used fresh, cwts. . . . .	.....	.....	31,244	.....	.....	10,111
Do., green-salted, cwts. . . . .	.....	.....	54,390	.....	.....	68,035



SEALING FILLED CANS

When the "speed-up" is at its height and minutes count in the mind of the anxious manager—then is the time when he appreciates "Bliss" Automatic Double Seamers.

The can supply and the operations of packing must flow smoothly and without interruption abreast of each other until the last case has been added to the pack.

"Bliss" Equipment—complete—has been taken to the

far parts of the earth where repairs or replacements would be difficult if not impossible to obtain—and has made good.

"BLISS" AUTOMATIC DOUBLE-SEAMING MACHINE No. 31-K is illustrated, above. For sanitary cans—the cans remaining stationary. May also be used in can shops for double seaming the ends on empty can bodies. Continuous chain feed delivers filled or empty can bodies to the seaming position at uniform speed. Covers fed automatically.

Write for Catalogue Section No. 18-A



E. W. BLISS COMPANY

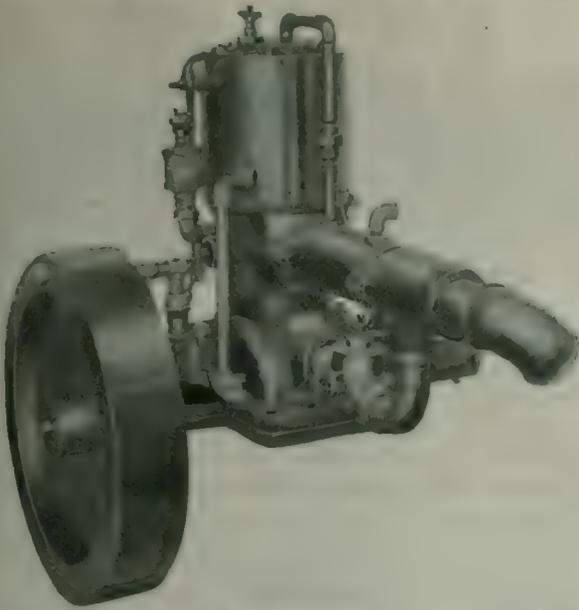


Main Office and Works; BROOKLYN, N.Y., U.S.A.

1857	CHICAGO OFFICE Peopl's Gas Bldg.	DETROIT OFFICE Dime Bank Bldg.	CLEVELAND OFFICE Union Bank Bldg.	1917
LONDON, S.E., ENGLAND, Pocock Street, Blackfriars Road		PARIS, FRANCE, 100 Boulevard Victor-Hugo St. Ouen		

Do., smoked fillets, cwts.					200
Do., dried, cwts.		41,881			52,862
BLACK COD, cwts.	12,254	52,373	4,893	20,918	
Do., used fresh, cwts.			11,168		4,393
Do., smoked, cwts.			546		250
HADDOCK, cwts.	70,216	183,789	56,765	81,788	
Do., used fresh, cwts.			22,683		11,744
Do., canned, cases			2,859		2,942
Do., smoked, cwts.			2,793		1,205
Do., green-salted, cwts.			1,198		3,689
Do., dried, cwts.			11,661		10,173
HAKE AND CUSK, cwts.	58,673	86,281	67,176	65,347	
Do., used fresh, cwts.			4,678		833
Do., smoked, cwts.			60		
Do., green-salted, cwts.			1,600		25
Do., smoked fillets, cwts.			320		
Do., dried, cwts.			16,570		22,095
POLLOCK, cwts.	34,039	61,250	35,294	37,630	
Do., used fresh, cwts.			3,134		5,806
Do., green-salted, cwts.			37		150
Do., smoked fillets, cwts.			454		
Do., dried, cwts.			9,822		9,726
HERRING, cwts.	92,271	132,360	95,783	101,139	
Do., used fresh, cwts.			17,136		5,364
Do., canned, cases			2,196		2,063
Do., smoked, cwts.			2,874		1,957
Do., dry-salted, cwts.					
Do., pickled, brls.			15,208		14,934
Do., used as bait, brls.			13,111		20,126
Do., used as fertilizer, brls.					
MACKEREL, cwts.	15,499	66,357	23,264	94,413	
Do., used fresh, cwts.			11,674		13,077
Do., canned, cases					
Do., salted, brls.			1,272		3,395
SHAD, cwts.	547	5,908	488	4,566	
Do., used fresh, cwts.			381		458
Do., salted, brls.			56		10
ALEWIVES, cwts.	469	726	485	662	
Do., used fresh, cwts.			112		161
Do., salted, brls.			118		108
SARDINES, brls.	29,774	215,570	18,801	37,602	
Do., canned, cases			19,201		12,925
Do., sold fresh and salted, brls.			25,580		15,646
HALIBUT, cwts.	39,963	391,647	55,674	299,151	
Do., used fresh, cwts.			39,877		55,674
Do., smoked, cwts.			43		
SOLES, cwts.	201	811	201	1,580	364
FLOUNDERS, cwts.	1,028	2,207	1,028	530	769
SKATE, cwts.	711	1,323	711	290	333
SMELTS, cwts.	156	1,440	156	384	384
OULACHONS, cwts.	66	198	66		
BRILL, cwts.	2,899	8,697	2,899		
TOM COD, cwts.	697	2,081	697	20	70
OCTOPUS, cwts.				2	14
SWORDFISH, cwts.	73	876	73	139	750
ALBACORE, cwts.	9,159	45,576	9,159	9,447	20,811
DOGFISH (for food) cwts.	5,740	2,296	5,740		
CLAMS, brls.	3,409	5,774		4,168	5,713
Do., used fresh, brls.				2,103	2,439
Do., canned, cases				1,306	1,739
SCALLOPS, brls.	50	200			
Do., shelled, gals.			100		
QUAHAUGH (fresh sold), brls.					
CRABS, COCKLES, etc., cwts.	1,244	5,174	899	1,312	4,156
WINKLES, cwts.					
SHRIMPS, cwts.					
SQUID (bait fish), brls.	2,222	6,197	2,222	313	1,100
LAUNCE (bait fish), brls.					

An Exceptional Opportunity for Fishermen



A few new 6 to 7 h.p. slow speed Marine Engines made by the Canada Gas Power Lamps, suitable for small fishing boats. These are the last remaining of a Bankrupt Stock, and are offered at low prices for quick turnover. Large stock of repair parts always available.

Don't miss this opportunity to secure a high grade engine at a Bargain Price.

Write Marine Sales Dept. to-day.

The A. R. Williams Machinery Co., Limited
TORONTO CANADA

Columbian ROW BOAT MOTOR

Saves Time and Labor

FOR five years the Columbian Row-Boat Motor has been giving SATISFACTION to thousands of fishermen, whose engines must be RELIABLE, STURDY, SIMPLE and ECONOMICAL. Although this motor contains every modern improvement, we are still selling it at **\$60** (\$10 extra for high tension waterproof magneto built in fly-wheel).



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We can supply complete equipments of two and four cycle marine engines up to 300 H.P.

Tell us your needs to-day, and we will be pleased to send you a catalogue. Address:—

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112 W. Lake St., CHICAGO, ILL.

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Shipmate Ranges

10 Sizes---14 Numbers

MATE — (To prospective cook) :—"Well, are ye goin' ter sign on with us this voyage?"

COOK.—"No, sir."

MATE. — "Why? We've got a good boat here—a good skipper, an' good fare."

COOK — (turning away): — "Aye, but ye haven't got a SHIPMATE in th' galley. Good day, sir."

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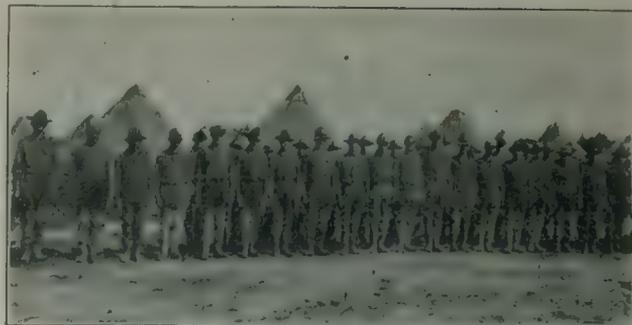
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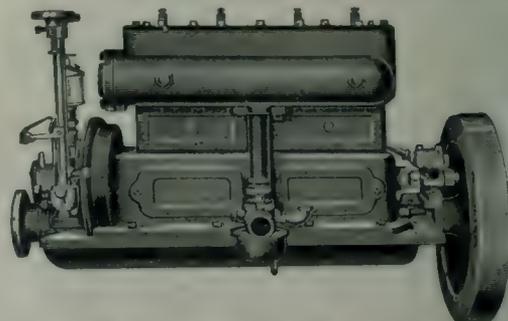
Established 1830



Uncle Sam never thought that the Camp of the Ohio National Guard at Camp Perry, Ohio, would be flooded by Lake Erie, or probably the soldiers would have been provided with boots. When water almost knee deep covered the entire camp the soldiers had to provide their own hip-boots. This picture shows about thirty-five members of the Guard wearing Goodrich Hiprees Boots, which they had to purchase themselves.

HERRING.

Split herring are still holding at \$5.50 to \$5.60. Nearly all that was remaining in the outports is now stored at St. John's, and will be held for better price later in the season, as the demand for our splits is likely to be very good in the autumn in New York, owing to the fact that there are such small quantities of European herring to come forward.—The Trade Review, St. John's, Nfld., August 4.



ENGINES

2 CYCLE — 4 CYCLE

3 to 50 H. P., 1 to 4 Cylinder

Send for catalog and second-hand list of bargains.

CHANGE ISLAND, Newfoundland.
There is no other make of engine (and there are many) around here but what have doubled the Guarantee in running expenses this year. The two-cycle men are trying to burn kero, but are having a lot of trouble. The Guarantee four-cycle engine will run a whole fishing season on the lowest grade of kero without cleaning. We did not so much as take out a spark plug to clean it this summer. Fishermen should buy four cycle engines for two reasons. First, because the running expenses are little more than half of the two cycle. Secondly, because it is much less trouble to keep them in working order. This is how I have found it after three years of experience and a thorough knowledge of the running expenses of both.

Arch. Scammell.

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HAMILTON, CANADA

W. A. Winsley.

THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV

MONTREAL, SEPTEMBER, 1917

No. 9

For All Your Requirements at Sea Use

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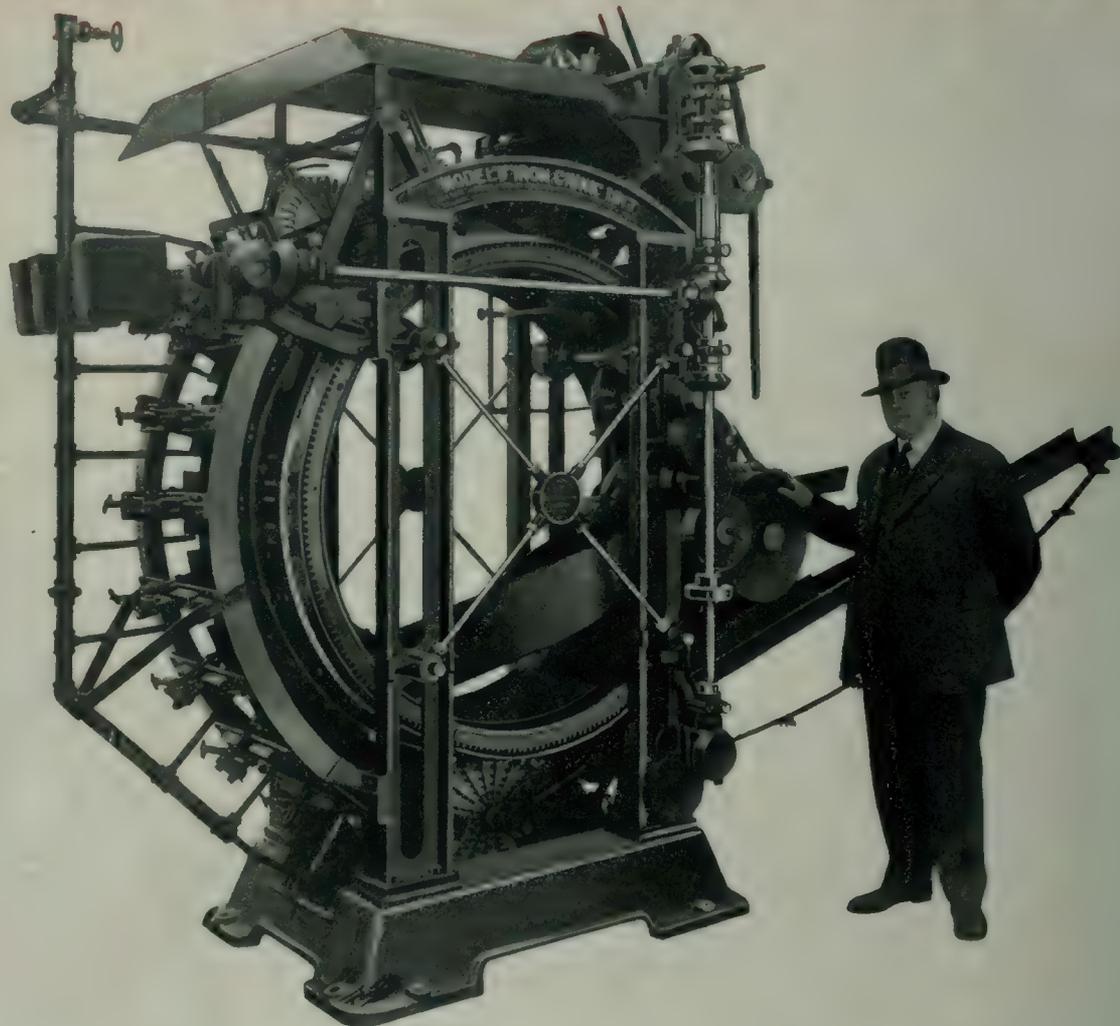
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The New "Iron Chink"



A COMBINED BUTCHERING, CLEANING AND SLIMING MACHINE. THE ONLY MACHINE OF ITS KIND ON THE MARKET.

For the past fifteen years we have been manufacturing Butchering and Cleaning Machines for use in the salmon industry.

These machines have proven themselves great labor and fish savers and a packing plant is not considered complete without one.

The above illustration shows our latest improved model—one that is far superior to any we have heretofore manufactured.

We are now taking orders for 1918 delivery. Full information, prices, terms, etc., furnished on application.

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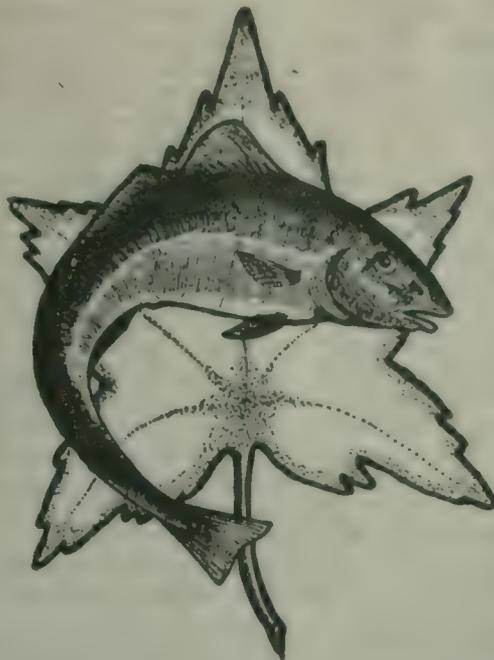
F. WILLIAM WALLACE
EDITOR

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Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, SEPTEMBER, 1917

No. 9

Food Control and the Fisheries

Food control is the question of the day. The war has brought about far-reaching changes in the production and distribution of the staple foods. Even in countries so distant as Canada the effects are felt in many different ways.

The volunteering, training, supply and transport to the front of so many of the most able-bodied young men have weakened the power of production, necessitated a re-disposition of labor, and brought about changes in the modes of living. The effects are felt not only among farmers and fishermen, but in mercantile and professional vocations.

Flour, beef, pork and other staple foods to which we have been long accustomed, lend themselves to the requirements of the army and navy, not only in their highly nutritious values, but in their ease of preservation and readiness to withstand shipment. At home we can make many turns—if we lack one thing we have plenty of others. At the front they have only what is sent them and that subject to the vicissitudes of time and transport.

Control of the production and use of wheat, cattle, pigs, potatoes, cheese, and some other animals and foods at home, will go far to keep up the food supply for those fighting for us at the front. To deny ourselves a fair share of the old stand-byes is the least we can honestly do. It is our patriotic duty to cultivate, assist, and encourage the raising of the grains and farm stock which are used in the production of cereals and meats and to temporarily refrain from con-

suming them ourselves by making use of the scores of other foods we find at hand to take their places. Milk, vegetables, fruits, eggs, poultry, mutton and other farm products that are best used fresh or are not so well adapted to permanent preservation or are not so economical in shipment should form a larger part of our meals. Game animals in a pinch can be resorted to.

In this country we have at our disposal an excellent substitute for meats in the abundance of our numerous species of fishes. Cities and towns situated on the borders of the great lakes and rivers, and on the sea-coasts have access to an almost unlimited supply, and when cities and towns are supplied the great masses of our consuming but non-producing inhabitants are provided for. When I recommend the substitution of fish for meat I mean fresh fish—leaving canned and cured fish for shipment abroad.

Canning is not confined to fishes and meats, but might be greatly extended in application. Instead of being restricted to the great canning companies it might be broadly employed on a small scale throughout the country by farmers and others and along our waterfronts by individual fishermen. They could at least economically put up enough for their own use and that would liberate great quantities for shipment abroad. Cans may be bought ready-made or the sheet-iron may be bought and the cans easily made at home. A small and cheap can-sealing machine, that can be clamped onto the edge of a table and worked by hand, is, I believe, now obtainable. With this outfit not only

may the old-time fruit-jar become largely supplanted but there is brought within the grasp of everybody a means of preserving his own canned fruit, vegetables, cereals, fish and meats at a time when these can be procured at the lowest cost.

When fish are scarce there is plenty of help to attend to all secured. But when fish come in swarms there is sometimes a shortage of labor, boats, salt, cans, or machinery, and much of the catch goes to waste. This should be provided against by foresight and calculation.

During the present summer fishermen have been greatly hampered in some parts of our eastern maritime provinces for lack of salt. The great herring weirs of Passamaquoddy Bay and Grand Manan Island may go for days or weeks without a catch worth seining; then, in one night, individual weirs may capture several thousand dollars worth. The writer has seen fifty hogsheads of sardine-herrings taken from a single weir at St. Andrew's, N.B., and as many more left impounded to be secured at the next low tide; and there are records of three or four times this number having been taken. In the vicinity of Nanaimo, B.C., herrings are at times thrown up on the beach like windrows and have to be carted away and used as manure to prevent pollution of the atmosphere of the city. But these are special cases. More often the buyers at salmon canneries limit the number of fish taken from each fisherman or boat, leaving many to go to waste.

The big quadrennial run of sockeye salmon in the Strait of Georgia and Fraser River has failed this year for the first time in the history of the fishery, but, notwithstanding a shortage in the so-called red-salmon, there will be an increase in the pack of pink and uncolored salmon, and these are just as nutritious, if not so attractive.

The immediate problems connected with increased consumption of fish, with a view to liberating greater quantities of meat for use in the army and navy, have to do with the capture, transport, distribution and consumption of fish.

The number of fish captured depends upon the number in the water and the efficiency of the means of capture. In earlier times when the waters were swarming with fish and when they were procured by rod and line, hand line, trolling line, trawl, gill nets, drift nets, and haul and purse seines, the catch was largely a question of man-power. The use of weirs and traps increased the catch and lessened the labor. The introduction of gasoline engines made a tremendous advance in effectiveness—rendering the fisherman independent of the wind, shortening his time of going and returning, and giving longer time for fishing, adding to the safety of the work and permitting access to more distant fishing grounds. The more recent introduction of steam trawlers—making use of beam or otter trawls—is the latest great advance in the use of appliances to save man-power and lighten labor. Such methods are beyond the means of individual fishermen and react towards the throwing of fishing into the hands of wealthy companies. In proportion to the number of men employed, the catch is usually great, and the liberated fishermen may be employed in handling, curing, canning, packing or shipping. This system would tend towards the reduction in number of able seamen and the limitation of fishing vessels to a somewhat small number of rather large steamers—both of which, while economical so far as the fishing

industry is concerned, would be unsatisfactory in crises such as the present, when trained seamen and large steamers might be required by the admiralty. But as steam trawlers are a comparatively new innovation in Canadian waters they have not changed to any great extent the previous methods of fishing. Outside of the trap-fishing, the setting of trawl from dories is still the effective method. The long-line trawl, set from a steamer, makes use of the same principle of ground-line with swords and baited hooks.

Another advance has been with regard to bait. When we recall the long waits that used to occur (and still do in many places), where fishing schooners lay in port for weeks at a time and the fishermen made the rounds of the herring and salmon weirs every morning looking for bait (herring, mackerel, squid), we are in a position to appreciate the use of cold storage and refrigerator plants in the laying up of bait at times when it is plentiful for the purpose of ready supply during periods of scarcity.

After procuring the fish the next problems are those of immediate transport to supply the inland demand for fresh fish and the immediate preservation or curing of the surplus for use at home in non-fishing seasons and for the trade abroad. Hitherto transport has been very inefficient both in action and in mode. Few fishing grounds are near the terminus of a railway, and the fish have first to be shipped by boat and re-loaded onto railway cars. As both the catching of fish and the sailing of boats are subject to the weather, there are unavoidable delays and misconnections. Fish can not be caught by schedule to suit the time-tables of steamboats and railway trains or to accommodate last minute hurry-up orders. In warm weather ice and refrigerator cars are necessary and there should be cold storage or refrigeration plants at both the fishing port and the delivery port. All these requirements are easily mentioned, but are expensive to construct and operate, and the fish handler, railway manager, or other, who puts his money into them, must be able to see a tolerably sure prospect. The saving of the surplus fish of a big catch after filling all orders, and the ability to fill orders and hold customers during slack fishing periods, as well as the ability to preserve orders that have through delay missed the market, will soon go a great distance towards paying the extra cost of the plant.

At the port of delivery there arises the question of effective distribution through the wholesaler and the retailer to the consuming public. Carting and exposing for sale as well as frequent handling tend to deterioration of the fish both as a presentable and a wholesome food.

The consumer, with his long-contracted habit of buying meat and eggs, is somewhat doubtful about risking new substitutes. The fish must be fresh and attractive and so must their surroundings. The last link in the chain of the fishing industry is the most important, for upon it depend all the others. If there is no demand from consumers there can be no distribution, no transport, no fishing. To create an increased demand from the consuming public it devolves upon all concerned to do their parts in bringing before the purchasing customer an article that is presentable, attractive, palatable, nutritious, and cheaper than those with which it has to compete. The fish merchant who puts his prices only a few cents below the meats per pound is too greedy and is injuring the business.

To adjust a regular and effective chain of opera-

tions between the fisherman and the consumer, insuring a constant stream of supply to a demand, the food controller has something to do; and so long as he exercises an impartial authority to accomplish this end he is performing a necessary work towards a worthy object. It may not come within his sphere of action to reduce the prices of food, but with the accomplishment of the before-mentioned machinery there should be some results in this also. It must be understood that fishermen (much less fish handlers and fish merchants) are not producers—except that they bring into commerce a food that might otherwise go lost. The fisherman, like the hunter, the lumberman, and the miner, takes freely what nature has provided without his assistance. The farmer is a producer, for he devotes labor and expense in the origination of his produce. In clearing the land, ploughing, seeding, fertilizing, and in breeding, feeding, and managing stock, he is subject to an initial expense, labor, and lapse of time, for which fishing has no equivalent. Only the harvesting and succeeding processes correspond with the expenses of craft, gear, tackle and work of the fisherman. Both in the expense of obtaining and in the nutritive value—pound for pound—fish must be lower in price than meats, eggs and cheese. This gives fish an advantage which, along with their lighter and more digestible food qualities, contributing to healthiness without overstocking and clogging or poisoning of the system, should bring them into much greater use than hitherto in this country.

In the numbers of varieties and differences of texture and flavor, and in the rotation of the catch in different months, there are presented opportunities for choice and change to suit the tastes of everybody. While cod, haddock, halibut, and salmon may be obtained fresh throughout most of the year, herring, mack-

erel, trout, whitefish, bass, pike, dory, smelt and many others come in their seasons.

The various methods of capture also supply variety in that the troll, the gill net, and the weir take for the most part surface feeders like salmon, mackerel and herring, while the line and steam trawls take especially ground fish or ground feeders, such as cod, haddock, halibut, flounder, etc. Winter fishing through holes cut in the ice of lakes and rivers gives access to fresh water fish (dories, etc.) to alternate with salt water fish from the ocean. Texture and flavor are contributed to fishes not only by the differences of salt and fresh waters, but especially by the differences of the animal and plant food-matter upon which the fishes themselves subsist. It must be mentioned also that both in the sea and in inland waters fishes secure and transform for the use of man food that would not otherwise be available, while the food-supplying farm stock make use of much that could be employed in other ways.

The chances are that the more or less emergency supply of meats during the war will so far reduce the live stock of the country that there will be a shortage for some years afterwards. The increase of the use of fish, lobsters, oysters, etc., in the meantime will, without doubt, set habits that will remain to the advantage of the fishing industry.

After the more immediate and urgent problems are attended to, there is a long-sighted policy necessary for the replenishment of the more or less depleted waters and the restitution of the catch. This is where production comes in. To be producers the fishermen and wholesale shippers would need to do something towards restoring to the waters some equivalent for what they extract from them. Fish culturists and hatcheries are producers in the proper sense of the term.

J. S.

Office of the Food Controller, Ottawa

September 14th, 1917.

To Lady Hendrie, the Members of the Women's Auxiliary of the Organization of Resources Committee and their co-workers throughout Ontario:—

Great Britain and her European Allies look to Canada for food. The King has notified the Canadian Government that "Increased supplies are absolutely essential to the defeat of the enemy's devices and to a speedy and successful termination of the war."

Lord Rhondda, the British Food Controller, has told the Dominion that Great Britain looks to "The resources of Canada and to the indomitable energy of Canadians for an answer that will shatter Germany's threat of starvation."

There is a world famine of wheat and a world shortage of beef and bacon. These are the commodities most required for overseas. It is to ensure supplies of these foods and other non-perishable and easily storable commodities that each housewife is being asked to sign the Food Pledge. Canada has abundance of other foodstuffs. By reducing domestic consumption of wheat, beef and bacon and by using substitutes the housewives of the Dominion can give vital war service. They will give it once they realize the ne-

cessity. And all that is asked at present is that they do not use beef and bacon on two days a week or at more than one meal on any other day, that they reduce their consumption of wheat bread by one-quarter and that they use perishable and non-exportable products to the greatest possible extent as substitutes for the staple foods required for export. The appeal to the housewives is contained in the one word substitute. When they realize the great need of the fighting forces and our Allies they will also save every ounce of food possible in order to release more for export. To do this means the complete conservation of our food supplies and the elimination of waste.

To yourself, to the members of your Committee and to your co-workers I wish to express my great appreciation of the services you are giving in circulating the Food Service Pledges by a house-to-house canvass and thus bringing home directly to the people the imperative need for substituting other foods for those required for export. Your task is an arduous one, but I am confident that the housewives of Ontario will respond splendidly to your war appeal.

Very truly yours,

(Signed) W. J. HANNA,

Food Controller.

Canada's Fisheries as a Source of Food Supply

J. STAFFORD, M.A., Ph.D.

II.

Outline of Structure as a Guide to the Study of Fishes



IN a previous article the importance of taking an inventory of our food-fishes was pointed out, and a brief review of our chief commercial species was followed by some statistics of their value for the preceding year.

It was seen that, although confined to those fishes of greatest economic worth to the country, the number of **species** is considerable. It is difficult to speak or write of so many different kinds and distinguish them clearly by means of **common names** that refer to separate species without including different species. The same common name is sometimes applied to several kinds, and one kind is often known by different names in adjoining localities. As near as I can recall, the black bass bears about fifty different local names in this country. When fishermen began to operate



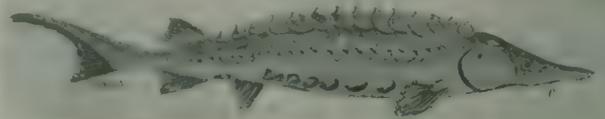
1. Dogfish.

on the Pacific Coast they called several different kinds of fish by the name "cod," and distinguished them by some qualifying terms such as grey, black, blue, red, etc., some of which so-called cods not even belonging to the cod family. In order to speak in a business-like way about our fishes it becomes necessary to refer to each species by a definite name, reserved for it alone. This can not be expected without some kind of understanding between those who need to talk much about fish, or between different parts of the country, or different countries:

When English people first came to this country they spoke of our fish by the names they were familiar with in the old land, even if the fish were not quite the same. The common names in France were applied independently of those in England, and the same may be said of other countries. Any fish that occurs in several countries is known by a different name in each.

With the increase of knowledge and interchange of thought between European nations there grew up a method of international communication by means of the Latin language, and when, later, there developed

a more scientific method of naming fish, **Latin names**, or sometimes Greek words changed into a Latin form, were employed. The name of the salmon in Latin is "Salmo." As there were several different kinds of fish bearing a close resemblance to the salmon, these had to be distinguished by descriptive terms. In the Latin language it was customary to place the adjective after the noun to which it referred, consequently the



2. Sturgeon.

complete designation for "brook trout" would be "Salmo fontinalis." The first to introduce this double name system (binomial nomenclature) was Linnaeus (1707-1778, called Linne after 1762), professor of botany at the University of Upsala in Sweden, the first published editions of whose work, "Systema Naturae," contained only the vernacular or common names. In the 10th edition (1758) the method was first applied to animals. The 12th edition (1766) was the last brought out by Linnaeus, but a 13th edition was published (1788) by Gmelin, professor in the University of Goettingen. The name of the species is followed by the name of the author who first applied it.

In relegating the naming to a single language in this way, a language taught in all countries, a great advantage was gained because, for one thing, if the same name were applied more than once it would soon be discovered and a different name would be substituted for all cases except the first to receive it. Another convenience is the fact that in whatever country a man lives, and whatever language he talks, writes, or



3. Herring.

reads, there is one name for each fish that he can understand, no matter how many others there may be of more or less inappropriate application.



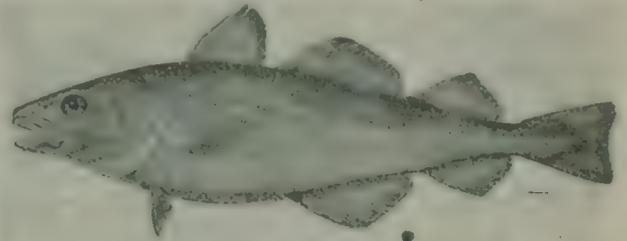
FISHERMEN, fish-handlers and consumers are sufficiently familiar with at least the superficial appearances of the commonest commercial fishes to know that each kind possesses characteristic features of a very constant, yet not altogether unvarying nature. The salmon, the cod (Fig. 7), and the halibut (Fig. 8), are as uniformly distinct from one another as are the domestic animals, the dog, the cat, and the horse; yet the more we

examine and study them, the more it is impressed upon us that, along with their constantly distinguishing features, there are others of a more variable nature. It is exactly these two opposing tendencies—the one repeating certain salient features, the other varying certain less outstanding characters—that bring about the similarities and differences which enable us to recognize the individuals of one species and distinguish

Colour originates under the influence of light and requires light to bring it into evidence. It is liable to vary in shade and intensity with the brightness of the locality, the clearness of the water, the character of the food, the age of the fish, the approach of the breeding season, even the mood of the fish. Many species rival birds and butterflies in bright colours and conspicuous designs. While some (such as the



4. Catfish.



7. Cod.

them from the members of another.

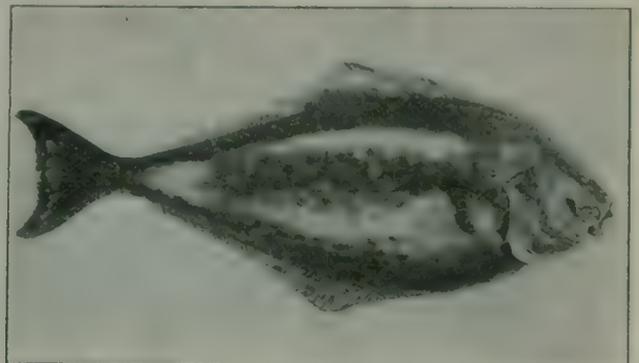
But resemblances and differences are not all superficial, and the more deeply we examine into the structure of fishes the more points of comparison and contrast there are exposed. It would be difficult, if not impossible, to distinguish such numbers of species by purely external characters, and especially as some of these are the least constant, such as size and colour. The carrying of the comparison to deeper parts is of

brook trout and the mackerel) may be recognized at sight by their colour-markings, in others (salmon, catfish (Fig. 4), pikes (Fig. 6), flounders) colour can not be depended on in distinguishing the different species in a genus.

Shape may change somewhat with growth and age, but is tolerably constant in fishes after they have passed their larval stages. A few, such as the eels



5. Eel.



8 Halibut.

the same nature as its application to the surface, except that it is less convenient, requiring the opening up of the fish, and perhaps a certain amount of dissection.

With some kinds of fish it is an easy matter to recognize the species at sight, such as the mackerel or the halibut, but with many it is not at all easy or certain to judge from appearances, especially where young individuals of a large species may be mixed with older ones of a small species. The young shad is

(Fig. 5), and the flat fishes, are very different when young and when full-grown. The common shape is fusiform or spindle-shape. The broadest part of the body is generally nearer the anterior than the posterior end, and, while the fore part may be cylindrical or flattened from side to side (compressed) or from



6. Pike.



9. Black Bass.

not always to be immediately distinguished from the gaspereau; similar sizes of different species of salmon or of whitefish require close scrutiny for recognition.

There is little that is hard and fast in the use of descriptive terms — nearly everything is relative. Words referring to size, such as large, medium, small, vary with their application. A large smelt is a small fish compared with even a medium-sized salmon, and the latter is small in comparison to a sword-fish.

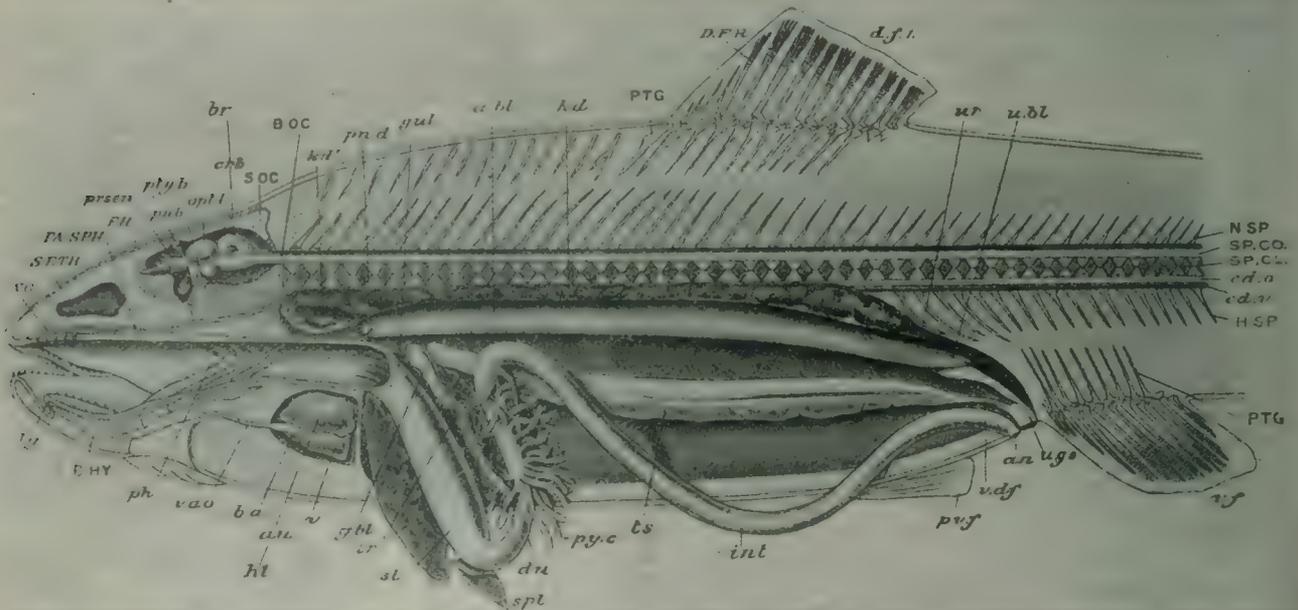
above downwards (depressed, the hind part is usually narrower than deep, facilitating the lateral movements of the tail.

Fins are very characteristic organs of fishes. They are outstanding, flattened parts, supported by skeletal rays, and capable of vibrating movements, useful in swimming, steering, or balancing. The great propelling fin is the one at the hind end of the body, the caudal fin (cauda meaning tail). It is frequently half-moon shaped and equally disposed (homocercal) above and below the axis of the vertebral column, but in the **dogfish** (Fig. 1) and **sturgeon** (Fig. 2) the upper and lower parts are unequal (heterocercal). There are two pairs of fins that are mated, left and right, on each side of the body, the anterior pair being called pectoral or breast fins, and the posterior pelvic or abdominal fins. These correspond with the paired limbs (fore and hind legs) of the higher classes of vertebrated animals. In fishes they are not lengthened or jointed, and are more like paddles than legs. All other fins are unpaired, and are not lateral, but median in position. There may be one above (dorsal) and one below (ventral or anal), as in the sturgeon,



ALL the fins that occur in the different species may be derived from a primitive type, that begins above the head or anterior end and runs in the median plane backwards around the tail and then forwards on the ventral surface to the anus, where it divides and passes along the ventro-lateral edges of the body to near the head again. In nearly all fishes some parts of this original fin have ceased to develop, leaving the variable number of dorsal or ventral median fins, but never more than two pairs of lateral paired fins.

Fishes are good swimmers, and to this end everything contributes. The shape of the body is adapted to meet and split the resistance of the water. The smooth surface and the set of the fins and of the scales are of a nature to reduce friction. The anterior end, preceding in locomotion, comes first in contact with external objects, and has been specialized to receive information, being modified into a head with the chief organs of special senses, feeling, tasting, smelling, seeing and hearing. Through gravitation and contact with the bottom, the ventral surface has become different from the dorsal, and the left and



10. Medium View of Right Half of Salmon.

herring (Fig. 3), **sucker**, **pike**, **chub**; or there may be two above (first or anterior, and second or posterior dorsal), and one below as in the **salmon**, **catfish**, **dory**, **perch**; or there may be three above (first or anterior, second or middle, third or posterior), and two below (anal and ventral), as in the **cod** (Fig. 7), **haddock** and others. In the eel the dorsal, caudal and ventral are continuous as one fin, and the pelvic fins are absent. In the salmon and catfish the posterior dorsal fin has no skeletal rays (adipose). In the **bass** (Fig. 9), the dorsal fin is partly separated into two, the anterior portion being supported by stiff rays, while the posterior part has soft rays. In many fishes the anterior rays of some of the fins are modified into bony spines, useful for defensive purposes. In **cods**, **basses**, **sun-fishes**, **perches** and **dories** the pectoral fins are raised up along the sides from the ventral surface, and the pelvic fins are moved forwards along the ventral surface until they may be below (thoracic) or actually anterior (jugular) to the pectoral fins.

right sides have been equally balanced.

Rapidity of movement, guided by highly developed sense organs, enables fishes to pursue and capture many smaller animals, which, in some cases along with plants, serve them as food. Competition for food brings them into strife with one another, against which they are protected by scales, bony plates, spines or teeth.

The **skin** is in some fish soft and slippery, but is in many tough and leathery, thickened, strengthened and defended by cycloid or ctenoid scales or enamelled plates. The **teeth** inside the mouth are only specially enlarged and modified skin-teeth, with which, in the sharks, they are continuous over the margins of the lips. They receive a solid basis of support in the skeleton of the jaws, and are turned to new uses in procuring, biting, and masticating the food.

Underneath the skin is the flesh of the body, consisting of the **muscles** that bring about the movements of the fins, jaws, gills and other parts.

Under the skin and flesh is the **skeleton**, which supports the soft parts, and gives attachment and means of operation of the muscles. The skeleton consists of skull and vertebral column, jaws, gill arches and supports for the fins. In sharks and sturgeons the skeleton is not bone but cartilage, which is softer than bone, but still strong and firm. In salmons there is a good deal of cartilage and the bones are not so dense and solid as in the great masses of the higher groups, where nearly all of the skeleton is bone. In the young it is always cartilage and only later comes to be partly or completely turned to bone. The cartilage ossifies from certain centres outwards, making bones that are separated from one another by bands of cartilage, the latter becoming reduced until they are mere lines (sutures), or completely disappearing.

The **skull** is pre-formed as cartilage, the cartilaginous skull (chondro-cranium), surrounding and protecting the brain, as well as protecting the nasal, optic and auditory organs. There are openings (foramina) left through the walls of the cranium for passage of nerves and blood vessels, and, when bones arise, they are formed with reference to the requirements of the brain, sense-organs, nerves, muscles, etc. There are unpaired bones in the median line, above and below, and paired bones, left and right, and most of them are constant throughout numerous species of the bony fishes, but some are variable.

The **vertebral column** consists of a number of somewhat cylindrical bones (vertebrae), placed end to end, and extending through the body to the tail. Besides supporting and strengthening the body, and giving insertion to the muscles, and other parts, this portion of the skeleton protects the spinal cord, as the cranium does the brain.

 **THE brain and spinal cord** (Fig. 10, br, co), form the central nervous system. From the brain arise ten pairs of cranial nerves, that pass through foramina to the organs of sense, muscles or skin; and from the spinal cord a pair of nerves for each vertebra, supplying muscles and other parts of the trunk. A branch of the tenth cranial nerve runs back along each side of the body, and is protected by specially modified scales forming the **lateral line**.

The **mouth** in sharks (Fig. 1), skates, and sturgeons is transverse, on the under side of the snout; in other fish it is terminal. There is no protrusible tongue, but a fleshy mass in the floor of the mouth is often called the tongue.

The back part of the mouth, more properly the **pharynx** (Fig. 10, ph.), opens by a row of **gill-slits**, generally five, on each side of the unconstricted neck-region. Water is taken in by the mouth and passed out by the gill-slits, flowing over the **gills** on its way. In sharks and sturgeons, the most anterior of the gill-slits is small, and a little removed from the rest, and is called the spiracle. In sturgeons and bony fishes the gill-slits are not freely exposed, as in the sharks, but are covered by a backwardly growing flap (**operculum**), from the cheek, leaving only one external opening on each side.

Food is passed through the mouth and pharynx into the **oesophagus** (Fig. 10, gul.), leading to the **stomach** and the **intestine**, and the undigested portions are extruded at the **anus**, on the ventral surface in front of the anal fin. The food is operated upon by secretions from the inner surfaces of the digestive canal, and from the **pyloric caeca**, which are finger-like processes from the intestine, after it leaves the stomach.

Digested (i.e., dissolved) portions of the food are absorbed into the blood-capillaries, which abundantly supply the inner walls of the stomach and intestine, and make their way to the liver and to the heart, and eventually to other parts of the animal.

The **blood vessels** form a closed circulatory system, of which the **heart** is the thickest and most muscular part. It is situated in the region of the throat and acts much as a force pump in driving the blood forward and upwards through the gills to the chief distributing vessel (**aorta**), which runs backwards underneath the vertebral column to the tail, and giving off branches on its way to the fins, liver, stomach, intestine and other organs. All these vessels branch into smaller and smaller vessels until the smallest, or what are called capillaries, are reached. The latter are very numerous, and are distributed throughout all parts of every organ to which blood is supplied. In these organs, by union of the capillaries again, fewer but larger vessels are formed, and these unite and re-unite into the largest that bring blood back to the heart. Counting the heart the centre, there are the outgoing vessels or **arteries**, then the **capillaries**, and finally the returning vessels or **veins**. The blood does not pass outside of these vessels, but, while in the capillaries, whose walls are extremely thin, there can be an interchange of the contents of the blood with the contents of the bodies surrounding them. Oxygen especially penetrates through the thin walls of the capillaries into the tissues around them, and carbon dioxide especially passes from the tissues into the blood. After the blood has circulated around the body and back to the heart, it is laden with carbon dioxide, and is somewhat blue in colour. On the way from the heart it passes through a capillary system in the rows of tender, red gill-filaments, where the carbon dioxide can be given out to the respiratory current of water passing over the gills and oxygen taken up in its place. Blood rich in oxygen is red in colour. There are other substances besides oxygen and carbon-dioxide in the blood; generally speaking we may say that it carries **nourishment** to the tissues, and takes away **waste** from them. The nourishment is supplied by the food eaten and passed into the intestine for digestion and absorption into the blood; the waste is got rid of through the gills and kidneys, and to some extent by the skin, liver and other organs.

The **kidneys** are situated below the vertebral column, one on each side, in close contact and sometimes more or less united. From each springs a duct, the ureter, but the two ducts often unite to form a urinary bladder, which opens to the outside immediately behind the anus.

 The **reproductive organs**, ovaries in the female, testis in the male, are situated below the kidneys. There should be one on each side, but they are often united, and each has a duct to carry off the product (eggs or sperm), to the outside, alongside those from the kidneys, with which they often unite.

An **air-bladder** is generally to be found in all the higher groups of fishes, situated between vertebral column, and intestine. It is what is called the "sound" by fishermen, and corresponds with the lungs of air-breathing animals. In a great number of fishes it is connected with the oesophagus by a narrow duct, through which air can pass to and from it.

Surrounding the chief viscera (stomach, intestine, liver, etc.), is a **body-cavity** (coelom), and around the heart a smaller space, the **pericardial cavity**.

The sense of touch is broadly distributed over the surface of the body, but is especially sensitive about the snout, where in catfishes there are projecting, movable feelers.

Taste and smell are closely associated in the mouth and nose and on the latter the external nostrils may be noted. Sight is relegated to well-developed eyes. Hearing is accomplished by a pair of internal ears enclosed beside the brain in the back part of the skull.

Description of Figures.

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| Fig. 1.—Dogfish. | Fig. 2.—Sturgeon. |
| Fig. 3.—Herring. | Fig. 4.—Catfish. |
| Fig. 5.—Eel. | Fig. 6.—Pike. |
| Fig. 7.—Cod. | Fig. 8.—Halibut. |
| Fig. 9.—Black Bass. | |
| Fig. 10.—Median view of right half of a salmon. | |
| Ph.—Pharynx (with 5 gill slits.) | |
| Gul.—Gullet (oesophagus.) | |
| St.—Stomach. | Du.—Duodenum. |
| Py C.—Pyloric Caeca. | |
| Int.—Intestine. | An.—Anus. |
| Lr.—Liver. | G. bl.—Gall bladder. |
| Kd.—Kidney. | Ur.—Ureter. |
| Ts.—Testis. | V. Df.—Vasdeferens. |
| U. G. O.—Urino-genital opening. | |
| Ht.—Heart (ventricle and auricle). | |
| V. A.o.—Ventral aorta. | |
| Cd. A.—Caudal artery (continuous with dorsal aorta.) | |
| Br.—Brain. | Sp. Co.—Spinal Cord. |
| Sp. Cl.—Spinal Column. | |

FAILURE OF THE SOCKEYE RUN.

August 23rd, 1917.

The Editor, Canadian Fisherman, Montreal.

Dear Sir:—I want to bring to your notice the very serious situation resulting from the failure of the Fraser River Salmon run this season. It means that the Fraser River is practically wiped out as a salmon producer. The total Sockeye pack from fish caught by some two thousand, four hundred fishing boats is, in this the supposedly "Big Year," only about one-tenth of what it should be, and is divided among some thirty-two canneries, while one could do the work. Many canneries have remained entirely closed. Were the river producing as of old, the market value of output this season would promptly have reached \$10,000,000 to \$12,000,000.

Does the public realize what a loss this means to the whole community, not only on operation alone, but in the scrapping of the plants, which is bound to follow? Our company owned originally half the number of Fraser River Canneries. We never expect to operate on the Fraser River again unless drastic action is taken towards restocking the river.

Experts state emphatically that with determined action and co-operation with the United States, the river can be brought back to its former productivity.

We have a Royal Fisheries Commission now here. The Fishery Department at Ottawa has been urged by canners, backed by associations of business men of the city, to permit the Commission to investigate conditions on the Fraser River, with a view to making recommendations for restocking. The importance of the matter seems to be of infinitely greater national interest than any other, coming under the scope of the Commission. The Dominion Fisheries Department

has so far refused to permit the investigation.

I write this in the hope that through your columns, public opinion may be sufficiently aroused, so that the authorities may be persuaded to seize what appears to be the opportune time for making an investigation of such vast interest to British Columbia and to the Dominion as a whole. I am,

Yours truly, (Sgd.) H. O. BELL-IRVING.

F. E. BURKE.

Francis E. Burke, general manager of the Wallace Fisheries, Limited, is one of the younger generation of packers on this coast, but he leads in knowledge, ability and outlook.

He came to his present activities after exceptional training. He is an honor graduate of West Point and served through the Cuban campaign with distinction, retiring to the reserves with the rank of Major. His upstanding figure marks him as the military man, while his direct, though courteous manner of doing business, suggests a school where things were done. For several years he was identified with the Swifts of Chicago, in an executive capacity and gained first-hand knowledge of the organization of large and efficient corporations.

He is young, ambitious, industrious, alert and able, with an unusual capacity for sustained application. He has done much to energize the functions of the associated canners, and is alive to all progressive tendencies in the industry. He makes an admirable team-mate for the president of the company, Mr. Peter Wallace, his father-in-law, whose long experience and matured judgment are happily supplemented by his enthusiasm and driving force.

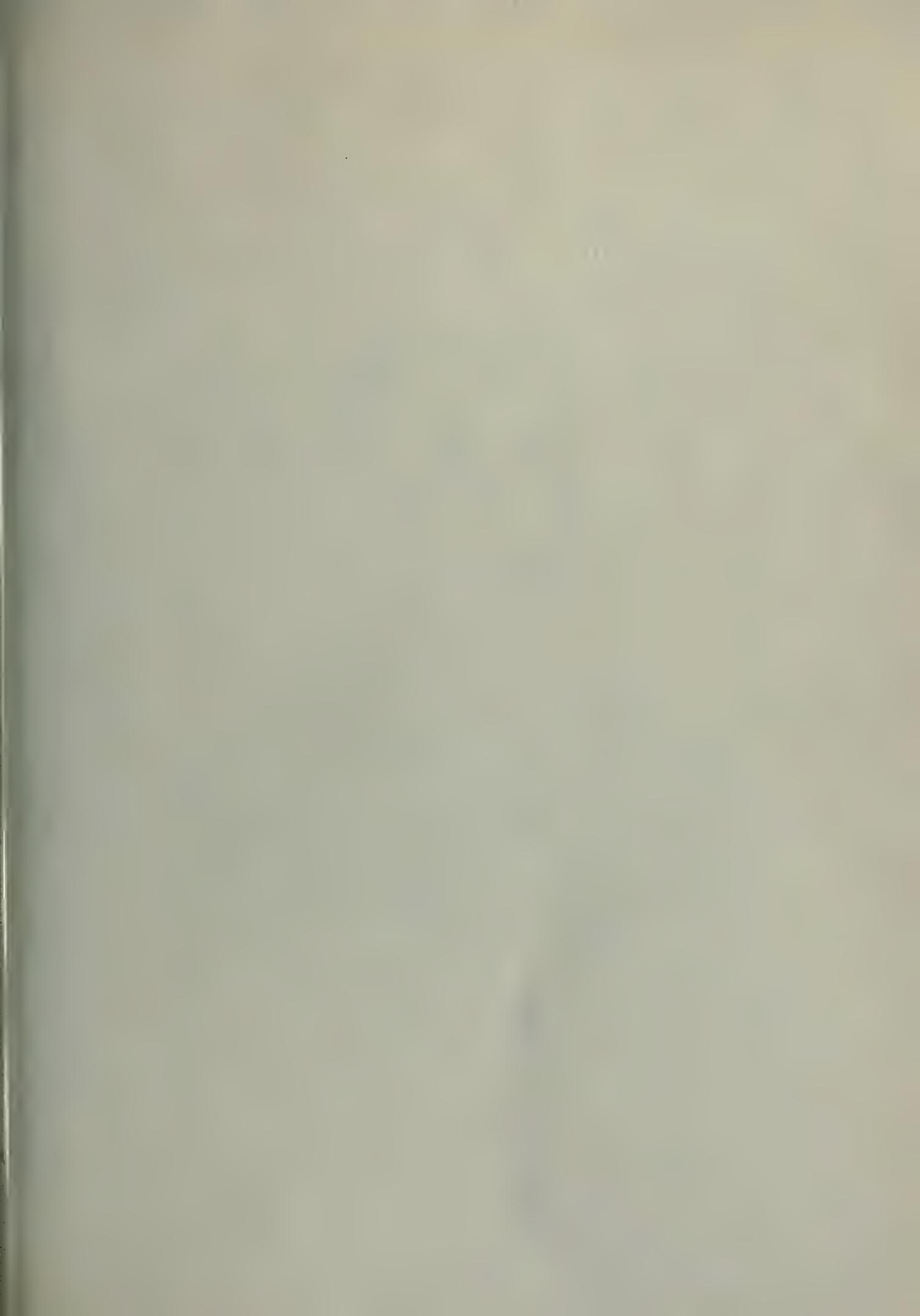
Close observers see in Mr. Burke an outstanding figure in the fishing industry of British Columbia. His wide acquaintance among men who are doing things, both east and west, and his perception of business on a large scale, as well as his undoubted abilities, are an earnest of a promising future.

FRANCIS MILLERD.

Francis Millerd, vice-president of the Gosse-Millerd Packing Company, is a young Irishman who came to British Columbia via South Africa, after risking his life fighting for Britain. There also he was on intimate terms with the financial and commercial life of Johannesburg, meriting the observation that he is a thorough business man.

Throughout his career as a cannery man he has been associated with Capt. Richard E. Gosse, and these two, together with the invaluable aid of the Captain's sons, have built up a notable aggregation of canneries and fishing establishments. In no small measure, the expansive progress of the company has been due to the imagination of this young Irishman and to his clear-cut vision. His energy is huge and he takes on problems that would make the less courageous falter. His worth is marked by his success which has been unflinching. The future has something big for this son of "Ould Erin."

It is a fair prophecy that a decade from now, F. E. Burke and F. Millerd will occupy the prominence in the British Columbia salmon canning industry now so adequately taken by W. H. Barker and H. O. Bell-irving; and that is a prominence worthy of the ambition of any young man. But, in time, youth will be served.





FRANCIS MILLERD,
Director, Vancouver Branch Canadian Fisheries Association



F. E. BURKE,
Vice-Chairman, Vancouver Branch Canadian Fisheries Association



The Battle for the Fishes

II.

How the Battle was Conducted for Restoration

By the HON. W. E. MEEHAN,

Former Fish Commissioner of the Commonwealth of Pennsylvania—Superintendent of the Fairmount Park, Philadelphia, Public Aquarium.—Author of *Fish Culture in Ponds and Other Inland Waters*, etc.



AS in nearly all great movements, the beginning for the restoration of the waters with fish life was sporadic and scarcely organized, excepting perhaps temporarily. Efforts to prevent the use of over destructive devices may be traced back to shortly after the Revolutionary War. The Legislature of the then newly organized Commonwealth of Pennsylvania was induced to enact a law to forbid the use of fish baskets, and about 1830 a law to regulate the kinds of nets and sizes of mesh for the catching of shad from the Delaware River, also to declare a close season for shad fishing.

Unfortunately either those who brought about the anti-fish basket law thought they had then done their full duty, or the act was so loosely drawn as to be unenforceable, for little or no attention was paid to it, and fish baskets flourished as before, and the Delaware River fish laws were completely ignored, excepting where the interests of the shore and the gill net fishermen clashed. In such instances, however, the preliminaries were usually an appeal to personal and bloody encounters rather than the law.

Those physical clashes were productive, however, of one great benefit. The legal rights of the riparian owners having been established, the gillers and the shore fishermen turned their attention to heading off industrial establishments that were showing a disposition to erect dams across the river to the threatened destruction of the shad fisheries. The matter had been prominently before the legislatures of Pennsylvania, New York and New Jersey many times before and joint Commissions created that had uniformly pronounced against the projects, but it was not until the fishermen took a hand that the legislatures of the three States specifically prohibited the erection of any complete dams, in any part of the Delaware River, excepting one of low height near the headwaters. That was probably the first big step for the conservation of fish taken in the United States.

Other States early enacted as loosely drawn and ineffective laws as Pennsylvania, but none of them to prohibit or regulate the size of dams for many years, or to do anything that would interfere in the lightest degree with the unrestricted operations of mill and mining industries. Even the highest State courts gave open and sweeping support to the latter's wholesale destruction of fish life by pollution. About fifty years ago, when citizens took legal steps to prevent the flowing of mine water, strongly impregnated with

sulphuric acid, into the waters of such streams as the Susquehanna, the highest court in Pennsylvania dismissed the suit of the plaintiffs in a decree in which it was said in effect that the big coal mining interests were of more importance than those of the people who lived along the polluted water courses, and that when water could be made to naturally run up hill, the pollution might be stopped. Years later that more than doubtful doctrine of public policy was disowned by the same tribunal, but that was when public opinion had become mightier than selfish interests, and had stringent boiler tight conservation laws, with State Department heads having almost Czar-like powers to enforce them. These are the Departments of Health and Fisheries.



NOT only were the efforts first made to cause a halt on the destruction of fish life sporadic and weak throughout the country, but efforts in behalf of the conservation of other natural resources were also. The growth and spirit of these isolated and unorganized individual conservationists were dishearteningly slow. In time, however, there were formed local fish protective associations, mostly for the protection of what are termed game fish; forestry associations; farmers' associations; commercial fishermen's associations, and health associations.

The farmers speedily banded themselves into a powerful nation-wide body, but the others for many years remained local organizations, and with little influence outside of their own locality. But, one after another they began combining until now there are potent national bodies covering all forms of conservation of resources.

During much of the period when these different interests were organizing and growing, each confined itself to the subject it was particularly interested in. The forestry associations worked entirely for the rehabilitation of wooded areas, the anglers for the preservation of game and food fishes, the pure water advocates for the conservation and purification of the water supply, and the health organizations for water purification and other sanitary movements for the improvement of public health.

Each worked for and secured for their interests State recognition by the establishment of Departments or Commissions, and for some National recognition of their importance by the creation of Bureaus. The fishery interests were among those securing both State and National administrative bodies.

It was aggravatingly long before each interest realized that the interests of all were closely interwoven, and that a union of all was necessary for complete success. The period when an alliance of all was made is well within the memory of the middle aged. When this was accomplished a big step was taken in conservation. The combined bodies of forestry, fisheries, water, game and health made a mighty force that is sweeping away reckless waste destruction, and the

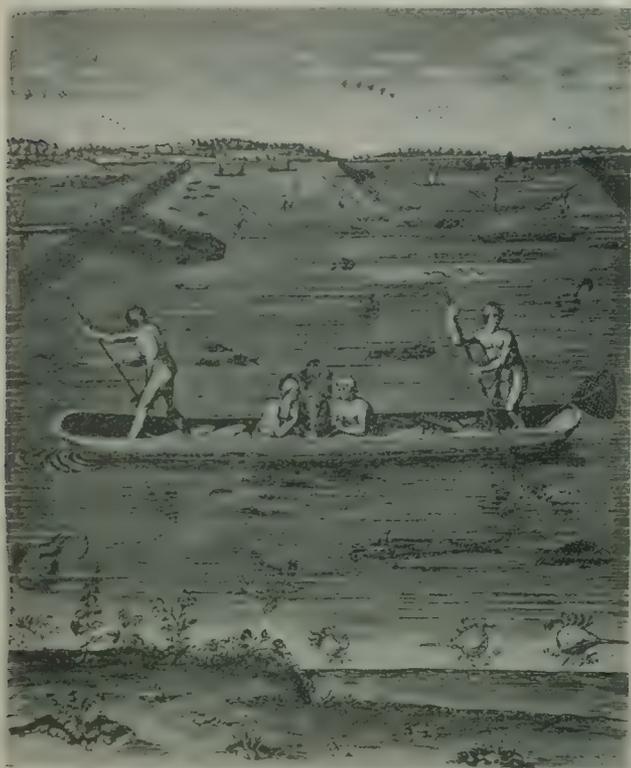
fish life, fish food or aquatic plants can lawfully be "run, flowed, washed or allowed to be run, washed or flowed or emptied into any waters within the Commonwealth." That is in the Fish Code. Under the laws framed for public health no city, town or borough sewage may be emptied into any river or stream without first being put through a process of purification.

It is an easy matter for the Commissioner of Fisheries and the Commissioner of Health to prevent any refuse from new establishments or any new sewage from being emptied into Pennsylvania streams, and no owners of plants or no new sewage systems established within the last twenty years have discharged refuse into an open stream in the State. The problem for the two officials to solve is to get rid of that which existed before the enactment of the laws and the creation of the two departments.

As Pennsylvania as well as other States in the past, not only did not forbid individuals and corporations to use the public waterways as open sewers, but actually killed legislation proposing it, there was admittedly an equity with the owners that made immediate and drastic enforcement of the new laws on long established plants savor of oppression, and also in some cases impossible.



IT takes time for small centres of population to design, raise money and put into service sewage disposal plants, and for huge cities like Philadelphia it is a gigantic and staggering task. For some owners of industrial establishments an immediate enforcement would either be an impossibility or cause financial ruin, or the closing of the plants. But the work of purification is going



Early Indian Methods of Fishing.

evils caused by selfish corporate and individual interests. Forestry reserves, both national and state, have been established and are being increased; the areas holding the headwaters added to and protected; establishments for the hatching of fish have been located by the United States Government and the States, and billions of young fish planted in the waters every year.

Effective laws for the protection of all the conservation interests have been enacted by States, and to some extent by the National Congress reviewing the work of the last twenty-five years, the progress made has been almost marvellous. The least progress has been made in abolishing water pollution, manifestly the very foundation of the work of maintaining public health and of restoring the fresh water fishes. The purification of the waters has been and is yet being bitterly contested by cities, towns and boroughs. The manufacturing interests profess themselves as not opposed to the purification aims, but excepting in a few sections and in some individual cases, have not ceased polluting the waters.

Pennsylvania has undoubtedly the best framed laws against pollution, and the heads of the Departments of Fisheries and of Health, in whose hands the enforcement of these laws are given almost autocratic powers; and Pennsylvania has probably accomplished more in this direction than any other State. Under its statutes no substance of any kind deleterious to



Early Indian Methods of Cooking Fish.

forward, and the time is relatively not far distant when every stream, large and small, in Pennsylvania, will be running in primal purity.

Every corporate city, town and borough in Pennsylvania has been served with formal notice by the Department of Health to have sewage disposal plans prepared and submitted within a specified time to the Commissioner of Health. Some have done so and have disposal plants built and in operation. Nearly all, if not all the owners of industrial establishments in the State have been notified by one or the other of the Departments to install purification apparatus. Many have complied, others are installing, others are experimenting to find the most effective as well as the cheapest apparatus. Some are doing nothing, except defying the State and these one by one are being haled before the petty courts and mulcted in heavy fines for their recalcitrancy.

New York and some of the other older States are doing good work towards removing water pollution. Most of the newer States forbid pollution in their fundamental law; in some sections scarcely anything is being done, but these are few, and steadily becoming less.

Some years before the movement for the purification of the waters became a great and potential one, another for the restoration of fish life by transplanting and artificial propagation was inaugurated. A knowledge of the latter had been brought to this country from France and tested with success. Something over four hundred years before, a scholarly priest in central Europe discovered that the eggs of the trout were fertilized after they had been extruded by the female, and that the eggs could be expelled from the female by the pressure of the fingers, and fertilized by the milt of the male taken in the same manner. This great discovery apparently did not get beyond the walls of the monastery for many years, and was consequently forgotten. About the middle of the seventeenth century, Count Jacoby, a German nobleman, either learned of the priest's works or, as a result of his own initiative, as he claimed at any rate, announced the practicability of artificially taking, fertilizing and hatching trout eggs, and invented a crude incubator device. The world regarded Count Jacoby's published paper, and his experiments as an interesting scientific discovery, but of no practical value. Hence as in the case of the priest, his work was also speedily forgotten.

About 1845 two Breton fishermen, Gehin and Remy, who were hardly likely to know anything about either Count Jacoby or the priest, by actual observation of trout in the act of spawning, rediscovered the fact of external impregnation of the ova, and by experiment learned that both the eggs and the milt could be expressed. They also invented a hatching apparatus, and after they had produced young, notified the French Government. The latter took cognizance of the tremendous value of the discovery, and, Gehin having died in the meantime, appointed Remy a Commissioner to teach the new art of fish culture.



AMONG Remy's pupils was an American, who, on his return to the United States, taught a friend, a doctor living in Sandusky, Ohio. He experimented successfully with lake trout. Through him several men in New York and Pennsylvania, among them Seth Green, Frank Clark, William Ainsworth and Thaddeus Norris, established trout culture plants as a commercial venture.

Later Seth Green experimented successfully with the artificial propagation of other fishes, notably shad, and by the time the United States Fish Commission was created by Act of Congress the so-called artificial fish culture was an established and practical fact.

Professor Baird, one of the foremost ichthyologists of his day, was the first Commissioner under the National Act. Many States, as the outcome of a national convention held in New England in the middle 60's, created Fish Commissions, and some authorized the establishments of fish hatcheries. Among these were New York, Pennsylvania, Michigan, Massachusetts, Rhode Island, and Wisconsin, States that in a few years were performing almost, and in some respects, quite as brilliant work in fish culture as the national Government. California and several other States whose Fish Commissions were established some years after those named have also placed themselves among the foremost in fish culture.

The strides made by the National Government and the States in fish culture in the half century since it was first introduced has been little less than marvelous. As a whole, the United States has left Europe far behind both in investigation and practical work. Fish culture has passed entirely from the experimental stage, and is virtually an exact science.

Doubtless the urgent need for something of the kind was the impelling force that spurred the mental activities to extending and raising the art of fish culture to the highest point of scientific and practical efficiency. The public has just awakened to results of the devastation of the streams that it had been permitting or overlooking, and was beginning to demand that something be done to restore the fish. The public had also begun to awaken to another stupendous and startling fact, namely, that even though the waters be restored to their primitive purity and drastic protective laws enacted and enforced, the natural increase of fish life could not keep pace with an increasing demand for fish from a rapidly growing population.



Juniata River, Pa., once a great shad stream. The industry has been destroyed by dams.

Consequently the discovery of Gehin and Remy came at the opportune moment. Improvements on the methods of incubating the eggs and the care of the trout when hatched were rapidly made. But there were other fish, the eggs of which either could not be handled in the same manner as those of the trout after fertilization or in limited numbers only. To care for these floating boxes were invented by Seth Green, and then, the triumph of fish cultural work on a vast scale, the hatching jar was invented.



WHILE experimenting and putting to practical use the results of fertilizing and hatching fish eggs, the interesting discovery was made that there was a group of fishes from which the eggs could not be taken by expression the same as from trout, shad and most other species. Foremost among these was the black bass, one of the three or four greatest American fresh water game fishes known.

Experts, and by this time there were many of them in the country, tried in every thinkable way to bring about the extrusion of the eggs and milt by finger pressure, but in vain. They even waited until the female was in the act of expelling the eggs naturally, but a few dribbling eggs was the best result. Also

it may be mentioned incidentally that after a female so experimented with was returned to the water, she was herself unable to resume the function of spawning naturally.

Inability to strip a black bass was the more perplexing when it was found there was little or no difficulty found in taking the eggs by finger pressure from some other members of the family, notably the common sunfish. Finding themselves baffled, fish culturists had recourse to the ancient European, Chinese and Japanese method of natural propagation in ponds and this, after many failures, they brought to success, and now pond culture holds nearly as important a place in fish propagation as the jar and hatching trough.

From fishes some indefatigable investigators turned their attention to the propagation of other forms of aquatic life of great economic value for food. Foremost among these were the hatching of lobsters and shell fish. The United States Government and the States of Massachusetts and Rhode Island were in friendly rivalry to solve the problem of lobster culture first. The two States won the honor. Oyster culture



Fish house, tugs, and net reels, Erie, Pa.

was solved by University biological laboratories, and the United States Bureau of Fisheries, after many heartbreaking failures, discovered that fresh water pearl and other mussels could be hatched by lodging the spawn in the gills of certain species of fishes. Pennsylvania experimented with the propagation of frogs, and progressed far enough to indicate that it was working in the right direction, and that under certain circumstances it could be conducted successfully and avoid the fate of the experimenter, who found that after he was well under way he met failure because, as he put it, "the big frogs ate the little frogs, and the little frogs ate the polywogs."

From the small beginning of hatching trout, by delving in the different fields of aquatic life, fish culturists in the United States have built a new and mighty industrial enterprise. It is mightier now than was dreamed of at the outset, and the benefits to mankind are already manifest and increasing. They are upbuilding a food product as valuable and as essential as meat and grain. They are establishing new and valuable commercial enterprises in products manufactured from the shells of fresh and sea water shell fish and the skins of fishes and aquatic animals and reptiles. They are giving new life to the sponge industry. But they are not through. They are constantly finding new fields to develop that have an important connection with the maintenance and increase of fish

and other aquatic life.

For example, when the knowledge of the breeding of fish was fairly advanced, it was recognized that the mere hatching and planting of fish was not all that was necessary to bring about invariable increase in the waters, even when they are reasonably pure. To thrive they must have food. Many of the waters had become depleted of plankton, small fish and other aquatic life, on which fish live. So fish foods and aquatic plants suitable for plankton life are being studied together with local water conditions.

In this work the Governments, and particularly the biological departments of colleges and great universities are engaged. Yes, more, the manual training schools and the higher schools of the public educational system of the more advanced cities have biological laboratories with specially trained teachers, in which the subject of aquatic life is given prominent attention. Indeed, the whole fishery question, both fresh and sea water, is considered of such vital importance that certain features of it, notably the economic value, are taught in the higher grades of the elementary public schools.



WHILE investigating and doing practical work in other fields of aquatic life, improvements in methods and manipulation in fish culture were made until the incubation of the eggs and the care of the young became almost an exact science. Under normal conditions, given the number of eggs, the culturist could tell with almost mathematical precision the percentage that would be hatched and in every case the number was far in excess of



Five tons of fish taken by one tug in one day, Erie, Pa.

what would have been produced in natural propagation. In some cases a statement of the excess would seem to the layman unbelievable.

The excess varies naturally with different types of fishes. It is smallest with those that build nests and greatest with those that do not, but scatter them and leave them to be free food for spawn eating creatures. Some interesting figures have been presented on this subject. It is perhaps impossible to figure accurately on how many eggs of a non-nest-building fish are

hatched or how many live reach maturity; but from careful observation it is possible to make an estimate. According to that estimate, generally agreed to be the maximum, not more than two per cent. of the eggs are fertilized and hatched, and not more than two per cent. of the young live to reach breeding age.

A moment's thought, with even only a rudimentary knowledge of fish life, must convince us that this is a liberal and not an under estimate—that half that percentage would be nearer a fact. Take a shad for example. The average number of eggs yielded by a female is 30,000. Many have 50,000 and more. A hatch of two per cent. of 30,000 would be 600. A like percentage of the young to reach maturity would be 12; or, if it be allowed that both parents died on spawning or shortly after, an addition to the stock of shad of eight for the pair.

If only 1,000 shad ascended a river for the first

the ends of the roes, and hatch from 75 to 80 per cent. at least of such species as the white fish and lake herring, and pike perch and blue pike, and would feel aggrieved if he achieved less than 85 per cent. from shad and 90 to 95 per cent. from yellow perch. He has therefore manifestly outclassed Nature.

He does not expect more than two per cent. of the fish he plants to reach maturity, or any more proportionately than the wild fish after hatching, for when the fish are only a few days old he puts them in the lap of Nature and her negligent care. But he gives her more to care for than she would have had without his having played the part of accoucher and nurse. From the 30,000 shad eggs he will hatch at least 24,000 young fish. If, after planting, two per cent. reach maturity, there will be 480 fish from the eggs of one female, or forty times the liberal estimate from natural propagation.



Trout hatchery, Corry, Pa.

time to spawn, there would appear three years afterwards from 8,000 to 10,000, and three years after that at least 75,000. After that the increase would be staggering in numbers, and soon over-populate the waters. This figuring, of course, does not take man's needs into consideration, for Nature did not when she created fish life, and provided for its maintenance. It must be conceded therefore, that two per cent. is a liberal estimate both for hatching and growth in the open waters.

A fish culturist would be ashamed of such a small percentage of hatching. By his methods, under normal conditions, he will fertilize about all the eggs taken from a female, excepting the few undeveloped at



AN effort was made in Pennsylvania to ascertain the percentage of loss of young nest building fishes from cannibalism among themselves in as nearly as possible natural environments. The young of ten black bass were placed in June, as soon as they had been deserted by the parents, in a hatchery pond of sufficient area to sustain them six months. They were fed daily, and as far as possible protected from reptiles and predatory birds and mammals. Early in October the fish, averaging from five to eight inches, were removed and counted. There were found to be less than 11,000.

The following spring the experiment was repeated with the same number of young, but they were placed

in a pond about five times larger than the year before. The pond was plentifully supplied with aquatic grasses and water lilies. Instead of removing the fish in October they were allowed to remain until May. On removing them there were found only 41 fish. The remainder, or over 23,000, had been devoured. The few that remained had attained a length of nearly a foot.

Experience with mature black bass in hatchery ponds in Pennsylvania was that about one half disappeared yearly, not including those that died from natural causes, and the assumption was that notwithstanding liberal feeding, the missing ones had found lodgment in the stomachs of their more fortunate companions.

At present there are at least 200 fish hatching plants operated throughout the year by the United States Government and the States, and at least that many more operated during the season for the propagation

is more than \$40,000, and it is not the leading State in this business.

Doubts have been expressed in some quarters whether the results of artificial propagation equal the cost. But it would seem that the results, so patent to all, should remove all doubt. When they are examined the findings are emphatic in their finality. In nearly every case where a particular fish has been propagated on a huge scale there has been shown a marked increase in the number of that fish. Per contra, almost without exception, fish that are not propagated are diminishing in numbers, and some, notably the sturgeon, show indications of early extinction.

Lake Erie is a conspicuous example of the huge benefits from artificial propagation. As an illustration. Some years ago, white fish had become so scarce that Pennsylvania, whose fishery business is second of the States on that lake, did not think it worth while to make a separate item of white fish when compiling



Interior of a trout hatchery. Three tiers of troughs. Capacity, 5,000,000 fry.

of some particular species of fish. In all these there are hatched and planted annually between 6,000,000,000 and 7,000,000,000 in public waters. Besides these there are throughout the country a number of sporting clubs that maintain plants for the hatching of trout for planting in their own preserves. In addition there are at least a score of establishments operated by individuals and partnerships for the sale of trout and trout eggs for profit, and these keep the markets supplied, for under the laws of nearly all the States, wild trout may not be sold. There are further a few plants where black bass are reared for sale.

The rearing of trout for the food market is one of the several valuable industries that have been created through perfecting the artificial propagation of fish. There are no data at hand concerning the value of the industry in the United States, but in Pennsylvania the annual business in brook trout for food purposes

the values of the various species, but lumped them among mixed fishes. After several years of heavy stocking by the National Government, Ohio and Pennsylvania, white fish became again abundant, and at the present time, Pennsylvania white fish industry ranks third in weight among the fishes, and second in value.

Pennsylvania's frontage on Lake Erie is only 45 miles, yet in that distance and to the Canadian line, since the partial restoration of the fishing industry, nearly fifty large tugs operate daily. These boats have in daily use over 400 miles of gill nets, with another 400 miles drying on the reels on the shores in the City of Erie. Five houses handle the fish caught, and it is said that one-tenth of the population of the City of Erie receives employment in some manner from the fishing industry.

Unused Canadian Sea Foods

By A. BROOKER KLUGH.



AT this time, when the matter of the food supply has become of such paramount importance, it behooves us to take far more careful stock of our natural food resources than we have been in the habit of doing in the past. We in Canada undoubtedly share with the inhabitants of the United States the distinction of being the most wasteful nations on the face of the earth. With our vast resources and our prosperity we have never needed to be economical, and we have picked and chosen among our food-products until our leavings and our wastage would have maintained a population as large as that of Canada. Some there are, it is true, the writer among the number, who have been pointing out for some years the need of a more efficient method of using our food resources, but it is not until the present stringency arose that this need has become apparent to the people as a whole.

needed to induce people to try this most nutritious food. Better systems of refrigeration and better shipping facilities now, however, allow the inland population to obtain sea fish in a condition which quite closely approximates that of the freshly-caught product. There is still some room for improvement in this respect, and it seems to me that it might be very much worth while to try the experiment of salting marine fish as soon as cleaned very slightly, not heavily bringing them, and then shipping in refrigerator cars.

The matter of the utilization of sea-foods at present unused has a two-fold value,—it provides a new source of food, and it lessens the strain upon those species which are now used commercially, many of which are beginning to show the effects of over-fishing.

One of our unused sea-foods is the Red Cod, a very fine food fish which is not a true cod, but a species of Sebastodes. These fish are caught in immense numbers on the trawls when fishing for halibut, and are at present thrown back into the water, and die be-



"Red Cod"—good fish and not wanted—sent adrift from a fishing vessel on the Pacific Coast of Canada.

The full utilization of our food resources falls under two heads,—Firstly: the discovery and bringing into common use of foods not hitherto used, and, Secondly: the proper handling of all food material so that no waste occurs. With this latter phase of the subject I do not propose to deal here, except to say that when we are dealing with the products of the sea it is of very vital importance that they should be so handled as to become available to as large a proportion of the population as possible. We have made considerable improvement in the past few years in this respect, and sea fish can now be obtained at inland points, which does not taste so much like wet blotting paper as that which used to be offered for sale. When one remembers the unpalatable condition in which our splendid marine fishes arrived on the inland markets one does not wonder that the demand has not been heavy and that even more than the slogan "Eat more fish" is

cause they are unable to sink. This inability to sink is due to the fact that the gasses in their swim-bladders are very much compressed by the pressure of the water at the depths at which they live, but when brought to the surface these gasses expand and render them lighter than water. Thus they float until picked up by the gulls. The Red Cod is a fish of fine flavour, with firm flesh and keeps well, so that it would readily stand transportation, and it is little short of criminal that we should waste tons of them annually. It is not far from the truth that for every pound of halibut which reaches the market a pound of Red Cod or other edible fish is wasted.



THE Black Cod, a species of Anoplopoma, is another good food fish which is caught in great numbers on the halibut trawls. In fact at some settings it sometimes forms the bulk of the catch. Yet it is but rarely brought to market,

and is regarded by the halibut fishermen as a nuisance.

A much-despised fish which is often caught in large numbers on the trawls set in shallow water on the Atlantic coast is the Mother-of-eels. This is really one of the most excellent of fishes, having firm white flesh of very fine flavour. To its high quality I can personally attest, and while I have eaten, while fresh and in prime condition, all our best-known food fishes, such as halibut, Atlantic salmon, different species of Pacific salmon, mackerel, haddock, cod, smelt and herring, I am bound to state that Mother-of-eels is the equal of any of them, and superior to some of them.

There are a few outstanding examples which occur to me of excellent fishes which are wasted, but I have not the slightest doubt that there are many other species which would prove very good as food if given a fair trial.

To create a market for these unused fish a great publicity campaign is necessary. The population at large must be educated away from silly prejudices against all except a comparatively few fishes. The fault at present does not lie with the fisherman; he will naturally bring in the fish for which the demand exists. But he will be able to do his part by supplying, at first in limited quantities, some of these species which the public are urged to try. The two factors must go hand in hand. There is no use asking the public to try a fish which they cannot obtain, and it is also futile to ask the fisherman to bring in quantities of fish for which no market exists. And now, at this time when a good deal of publicity is being given to the use of fish, is the time to introduce these species to the public.

Another sea-food which is at present wasted in Canada is roe. Fish roe, that is "hard roe," the eggs still contained in the ovaries of the fish, is now rejected with the entrails. Yet it is a most nutritious food, and when well salted is not only of excellent flavour, but keeps indefinitely. This would be purely a by-product of the various fishing industries, and as such would be a clear gain. As far as I know, no fish "pastes" are put up in Canada, and we have had to depend for our supply of these upon importations from England. These importations have now ceased, or practically ceased, and it seems to me that the time is opportune to place on the market a paste made of fish roe, a paste similar to the "Potted Cod's Roe," which was put up by a well-known British firm. This is only a minor point in comparison with some of our unused sea-food problems, but nevertheless is one worthy of consideration.

Still another of our unutilized sea-foods is the Abalone. This shell-fish is common along the whole outer coast of British Columbia, and at the present time is almost entirely neglected. The Abalone is an ally of the oyster and scallop, but has only one valve to the shell. This shell is from four to six inches in length, and completely covers the upper surface of the body like an inverted saucer. The shell is red on the upper surface and has a series of breathing holes which allow the water to pass over the gills of the animal within. It is found on rocky coasts and attaches itself to the rocks by means of its large foot. Since the foot is composed largely of muscle and also has a large muscle attached to it the main mass of the animal consists of muscle and it is consequently very nutritious as food much more so than the oyster, in which most of the body is softer and more watery. This

muscle of the Abalone is of very fine texture and flavour, and it is now being canned in California, where a species different from, but closely allied to our northern species, is found. Our species has been canned at Bella Bella, B.C., but seems to have been placed on the market in very small quantities.

The large Horse Mussel of our Atlantic Coast, is another species which never seems to have been used commercially. At some points they are very common, and tests which I have made of them proved them to be of good flavour, equal or perhaps superior to oysters. We have an abundance of shell-fish on both coasts, many of which, I am convinced, would prove of value as food if given a fair trial.

CAPTAIN GOSSE.



THE story of the fishing industry in B. C., when it comes to be written, will have a chapter devoted to the activities of Captain Richard E. Gosse, President of the Gosse-Millerd Packing Co., with canneries on the Fraser River, at Bella Bella, and on the Skeena River.

For thirty years he has been identified with the fishing and canning industry of B.C., and even today at 65 years of age, he works a full day with a vigor and capacity that would overtax a younger man.



Captain Gosse, President (left), R. Johnston, of Inverness Cannery (right).

In particular he is a firm believer in the possibility of building up an independent class of fishermen on this coast, who may find occupation in the fishing, in the canneries, in the cold storage, in the salteries, and in the smoke-houses of the fishing industry, which adjuncts he hopes to see established wherever good locations are available, in order that constant employment the year round may be provided for them.

He is carrying on experiments in this direction at his cannery and cold storage at Bella Bella, and has demonstrated the feasibility of his ideas.

He is a man cast in a herculean mould, standing six feet and tipping the scales at 280 pounds. He earned his title of Captain on the sealing floes off Labrador, where he skippered his own vessels for years.

The Labrador disaster of 1885 hit him as well as hundreds of other Newfoundlanders, and he came out to British Columbia when canning salmon was in its infancy. He first went into the construction business, and personally superintended and built on the Fraser River and Puget Sound, and other points in B.C., 14

The story of the building of the Star cannery is one of the epics of the Fraser River. On the day it was finished it burned to the ground. But between June 19th and July 9th, it was re-built in exact replica even to the three coats of white paint, to the utter astonishment of everybody on the Fraser River. James Robertson, of Robertson & Hackett, said it could not be done. Everybody laughed at the thought that a cannery with a capacity of 40,000 cases could be put up in three weeks, for those were the days of crude saw-milling and hap-hazard transportation. But the Captain fooled them all, and made his reputation for driving capacity and efficiency besides. Twenty-five of the fifty foot joists for the cannery loft took only one day, from the time they were cut down as trees, trimmed as logs, sawn into proper lengths and sizes and fitted and morticed into the building. This was an unheard of thing, and would stand some beating even to-day.

Not only as a builder, but also as the manager of canneries for others, Captain Gosse was a success, and



Gosse-Millerd Cannery, East Bella-Bella, B.C.

salmon canneries that won him the championship among cannery builders, a title that he still carries with the runner-up a long way behind.

Later he associated himself with the late J. H. Todd as manager of the Richmond Cannery on the Fraser River, and when the founder of J. H. Todd and Sons passed away, he retained his position under his son, Charles Todd, of Victoria, for a number of years, and left him only to embark as a cannery owner for himself, in which venture he has been successful.

In a recent conversation he recalled that it is 22 years ago this year since he built the Star Cannery on the Fraser River for the late and lamented Mike Costello, the picturesque pioneer of Vancouver.

A few weeks ago the Captain inspected this very cannery, which he himself had built, but which his firm now owns. He found the building in the best possible shape, and was impressed with the romantic fact that the cannery he built for another man is now his own.

when he went into the cannery business on his own it was not to be marvelled at that he was equally successful. He bought the Bella Bella Cannery in the face of coast-wise opinion that it would not pay, that the fish were not to be got, and that the past was against it. But the Captain proved that his opinion was right, though it ran contra to the general opinion. Heartened by his success in an independent way, the Captain continued to back his own judgment, which was re-enforced by his energetic sons and Francis Millerd, an experienced canneryman and business executive. Out of this grew the Gosse-Millerd Packing Co., which bought the Vancouver Cannery on the Fraser, perhaps one of the largest and best equipped canneries in B. C., and also the Star Cannery. The Fraser River interests are cared for by Bob Gosse, eldest son of the Captain, and Mr. Millerd, the general manager of the firm. To encourage his son Dick and his son-in-law, J. F. Strang, and to further back his own faith, the Captain built last year a cannery at

Sunnyside, on the Skeena River, with all the old time speed and vigor shown thirty years ago, and succeeded in a race against time in putting up a fair pack. Now the Gosse-Millerd Packing Co. may be said to be established, and with some of the keenest minds among the younger cannerymen to draw on for inspiration and action, the future of this company may be said to be assured.

sibility in a large fishing enterprise is a great part of its success.

The Captain comes from stalwart British stock. He was born at Spaniard's Bay, Newfoundland, an historic spot closely associated with the beginnings of the extension of the British Empire. The name of Gosse has been a household word in the Island Colony for generations, and by correspondence the Captain re-



Gosse-Millerd Cannery, Skeena River, BC.

At 65 years of age Captain Gosse may well be proud of what he has accomplished since he came to B.C. in 1887. Particularly may he be congratulated on his sons and the men he has chosen to aid him in the directions of his enterprises. This company, like some others that may be named, is propelled by young men and marks a distinctive tendency in the fishing industry in this province. The Captain's capacity is shown in no other particular more clearly than in his genius in selecting the right men with which to surround himself. The proper division of labor and respon-

sibility in increasing the production of fish. He expects to visit this fall for the first time since he left. He is one of the landmarks of the B.C. canning industry, and is entitled to a holiday after the good work he has done in increasing the production of fish.

When he goes East he will go as a missionary to the Newfoundlanders, and when he returns it would not be surprising if he brought many families of fishermen with him to establish them at his various fishing locations in keeping with his ambition to see an independent class of fishermen in this coast.

JOHN WALLACE.



JOHN Wallace, who up to this year, when he sold out to the Western Packers, Limited, ran the Butedale Cannery on Wark Island, is one of the real old-timers in the fishing industry on the Pacific Coast. In partnership with his brother, Peter Wallace, now president of the Wallace Fisheries, Ltd., twenty years ago he shipped the first frozen steelhead salmon to Aberdeen, Scotland, and for years afterwards continued his shipping.

He believes that the otter-trawl, catching cheaper grades of fish, such as flounders, soles, ling cod, red cod, whiting and turbot, will soon revolutionize deep sea fishing in northern B. C. waters. These cheaper fish are excellent as food, and all that is needed is the building up of a market for them among the consumers of Canada.

He recalls that half a dozen years ago he bought the takes of the otter trawler Kingsway, then owned by The Standard Fisheries, and by curing the fish as well as freezing them, and shipping many of them to China, he was able to make it pay. With conditions greatly changed to the advantage of the marketing of these fish, he thinks the time is opportune to estab-

lish the trawling industry on a permanent basis.

To this end he considers that the assistance now given to the shipment of halibut should be transferred to the shipment of trawl-caught fish. This would not affect the halibut market, as it is an established one that can afford to pay a little more for its raw product. But any assistance given the cheaper fish market would stimulate production to the advantage of the Canadian consumer.

The fact that food fishes in quantity equal to the quantity brought to port are destroyed in halibut fishing every year, suggests that something be done not only by the fishermen and cold storage companies, but also by the Government to prevent this waste of valuable food product. Expert knowledge of market conditions and transportation problems is needed to establish a market for fish which are now practically unknown to consumers. Pioneer work in this direction is necessarily costly and unremunerative at first, though doubtless the results in time would be profitable. Encouragement by the Government seems to be the need of the moment, and it is not unlikely that the Fisheries Commission now in B. C. will recommend such a move.

ADMINISTRATION OF FISHERIES IN NORWAY.

By COLIN MCKAY.



NORWAY, being a famous fishing country, a brief description of its system of administering its fisheries may be of interest.

As other countries, Norway has not arrived at a stage of sufficient recognition of the fishing industry to grant it a special Minister. Since 1900 the Minister of Commerce has been the official head of the Fisheries Administration; the practical direction is vested in a bureau with offices at Bergen. This bureau disposes of a budget of \$125,000 per annum at the present time.

Associated with this bureau in an advisory capacity is what is called the Fisheries Council, composed of 16 representatives elected by the districts interested in fishing. This council assembles at Bergen at least once a year usually for a week in the autumn. It considers the budget prepared by the General Director of Fisheries, and discusses any question relating to the catching, curing and marketing of fish, which may be brought before it. In practice the administration takes more the form of a commercial enterprise than a ministerial function; though the Minister of Commerce is constitutionally responsible for all decisions taken.

Immediately under the General Director there are two advisors—one concerned with legal matters and the other with technical affairs. These are assisted by a secretary and four assistants. The present General Director is Johan Hjort, formerly chief biologist of the scientific service, a man famous throughout the scientific world. He is the somewhat rare combination—a distinguished savant, with a genius for organization and directing scientific researches towards practical ends. Many important developments have been directly due to his initiative and persistence.

Three inspectors, with offices at Bergen, exercise general supervision over the fishing on all the coasts. They are men of technical knowledge, who frequently represent Norway on International Commissions, and at expositions. Among their functions is the granting of applications from fishermen for loans from the Credit Maritime—a state fund.

The Administration maintains two foreign agents, who reside at Hull and Hamburg. These agents furnish information necessary for the improvement and extension of the Norwegian markets in England and Germany. Their reports are published in a fortnightly journal, along with extracts from reports of Consuls in all parts of the world.

This journal, the "Fiskets Gang," also publishes articles on the results of scientific research work concerning the prosecution of the fisheries and the curing and conservation of the product.



MAINTAINING close relations with the central bureau are numerous societies, composed of fishermen, vessel owners, wholesalers, retailers. Although of a private character, many of them receive subsidies from the state. They have interested themselves in fishing problems generally, established museums, founded fishing schools, organized courses in the preparation of fish. In 1913 their subsidies amounted to \$12,500.

In addition, the administration bears the expense of experiments in new methods of transporting fresh fish and in the preparation of fish destined for foreign markets. A considerable sum is also paid to curers and fishermen, voyaging to foreign lands, with the object of increasing their professional knowledge.

The Administration maintains a steamer called the "Michael Sars," which is well appointed for scientific and oceanographic research work. A large laboratory is maintained at Bergen, and to this an aquarium is attached. One section of the laboratory specializes in the study of the conservation and curing of fish and fish products.

The Administration conducts a fisheries protection service, costing about \$50,000 a year—or more than a third of the total budget. It polices the territorial waters against foreign poachers, and sees that the native fishermen respect the regulations. An armed vessel protects the territorial waters, and to enforce the local regulations temporary staffs are appointed, according to the fishing season, to work under the direction of the Commissioners of Police, who receive indemnities for their services.

In connection with the herring fishery, the Administration employs 16 inspectors at the principal stations. They see that the herring is properly packed, mark the barrels according to the grade of their contents, and also stamp them with the date on which the fish was caught. The inspection is very careful, and by consequence Norwegian herring have an excellent reputation.

The distinctive features of the Norwegian system of administration are the centralization of authority and direction, combined with close relations with representatives of local interests, the attention given to scientific research, and the facility with which it lends itself to the promotion of new enterprises, and the popularization of new methods of fishing, curing, and even cooking. That the Administration has contributed largely to the development of the fisheries there can be no doubt. Royal Commissions appointed to report on the reorganization of the fisheries administrations of England and Scotland have made recommendations that indicate they considered the Norwegian system a model one.

(Mr. Colin McKay's name was unintentionally dropped from the article "On Oyster Culture," in the last number of the Canadian Fisherman.—Ed.)

TYPHOID FROM GERMAN FISH.

The marked decline in typhoid cases in London since supplies of undersized plaice and dabs from the mouth of the Elbe have been unavailable owing to the war is discussed by Dr. Hamer, the L.C.C. Medical Officer of Health, in his report for 1916. Last year only 461 cases were notified, compared with 789 in 1914 and 607 in 1915. Dr. Hamer recalls how in 1910 and 1911 the "nursery grounds" on the Danish and German coasts near the mouth of the Elbe came under suspicion, and remarks that in 1915 typhoid was at a low ebb in London, that the autumnal rise was again absent, and that a similar experience was reported from Hull, Grimsby and Midland towns. In 1916 the changed behaviour of the disease was again observed, and investigation made it clear that typhoid reached a high level in London in the years when there was a maximum use of the Elbe area, that a decline followed upon a gradual disuse of the area, and that its discouragement as a future source of supply to this country was justified. Perhaps some fervent patriot will declare that the Germans sent us typhoid of malice prepense.—The Fish Trades Gazette.

Burbot and Sablefish are Really of "Codfish Aristocracy"

Dr. H. F. Moore, Deputy U. S. Commissioner of Fisheries: Describes Former as Fresh Water Cousin of the Cod — Black Cod of Pacific now has new Cognomen

Back in Days of Chivalry Burbot was Esteemed a Great Luxury — Was Little Known in United States Until Bureau of Fisheries Popularized it Sablefish a Commercial Food



A FAMOUS Italian naturalist of the sixteenth century relates that a certain countess carried her fondness for the burbot so far that she expended most of her revenue in its purchase. The lady's income is not stated, but if there be American housewives ambitious to live like countesses, they now have the opportunity without plunging into bankruptcy, for the burbot is coming on the markets at a price which will place it within the reach of modest means. That there are additional and better reasons for using it is shown by the testimony of other authorities, one of whom says that in continental Europe it "has long been esteemed a great luxury; * * * its flesh is white and delicate, while its liver is its most delicious morsel."

In our own country it is almost unknown except to fishermen, and by them it is but little regarded because, heretofore, it has not been readily convertible into cash. Somebody years ago, in an attempt at wit called it "lawyer," because, as explained by a Lake Erie fisherman, "it preys on its fellows and is no good itself." The author of the quip and his successors have paid the penalty, so often following an ill-natured epigram, and have unwittingly lost a source of revenue, while the public has been deterred from using a needed food supply. The fish is also variously called eelpout, eeling, ling cusk and a score of names, most of which properly belong to other species, but its good old English name, burbot, which is rarely used in the United States, outside of books and a few restricted localities in the East, has the sanction of propriety and ancient usage.

The burbot has the distinction of being the only fresh-water member of the cod family, all of its relatives living in the sea. Its habitat circles the earth, two almost indistinguishable species being found, one each, in the lakes and larger streams of the northern parts of the two hemispheres. In North America it occurs from the Arctic Circle, and perhaps beyond it, to the Ohio and Missouri Rivers, being particularly abundant in the Great Lakes and the larger waters of New England, New York, Canada and Alaska.

It is said to spawn in the winter and early spring and like most of its family is exceedingly prolific, estimates of the number of eggs ranging from 160,000 in a medium-sized fish to 670,000 in a large one. Its voracity is notorious. By day it hides in the holes and crannies of the bottom or in the deeper waters, but at night it goes forth to prey on other fishes, crayfishes, and, at least in early life, on aquatic insects and fish eggs. Its highly distensible stomach is as elastic as its appetite and it takes a heavy toll of its neighbors, the particular trait which has brought it into disfavor with the fishermen who brook no rivalry in their calling.



IN shape the burbot is rather elongate, but with age it has a tendency to lose its slender figure and become "pot-bellied." In life it is beautifully marbled with dark green, or greenish black, and yellow, but the colors quickly fade after death. The consumer, however, will have but little concern with the physical appearance of the fish, for usually it will be placed on the market skinned, dressed, and decapitated, and what he buys will be all edible, with the exception of a small portion of backbone. With no transportation charges to be paid on waste parts, and its low initial cost, the fish should be as low-priced as it is good.

The meat of the burbot resembles, generally, that of the cod and haddock and it may be cooked like those fishes, with due consideration to its smaller size. If frozen, it should be purchased while still congealed and thawed in cold water immediately before using.

Recipes.

(Recipe No. 1 was contributed by Mrs. Albert Sidney Burleson; Nos. 2 and 7 by Mrs. William C. Redfield; Nos. 3 and 13, Lake Erie fishermen's recipes; Nos. 4, 5, 6, 8, 9, 10, 11 and 12 adopted from New English Fish Exchange recipes.)

1. Burbot mousse. — Steam the fish until tender, about 30 minutes; remove bones and press meat through a colander. Prepare a white sauce as follows: Into a saucepan put one tablespoonful butter, one tablespoonful flour, and one saltspoonful salt. When hot, add gradually one cupful of milk, cook until smooth, about 10 minutes, stirring constantly.

To two cupfuls of the prepared fish add the sauce, one small onion minced, one tablespoonful minced parsley, one tablespoonful melted butter, and the beaten whites of two eggs. Mix all together thoroughly and put in a mould. Put in a cool place for three or four hours. Turn onto a platter and serve cold with egg sauce.

2. Burbot hash.—Flake one pound of cold, cooked fish, add one pint of boiled potatoes in small pieces, mix with one teaspoonful of butter, and season with salt and pepper. Place in a buttered frying pan and stir until thoroughly heated, then leave long enough to brown on the bottom. Turn out on a platter, brown side up.

3. Fried burbot.—Remove the backbones from four pounds of burbot and cut the fish into suitable pieces for serving. Salt and pepper both sides, dip in egg and roll in cracker dust or bread crumbs. Fry on both sides to a golden brown. If the fish are large, they are better if the pieces be first parboiled.

4. Boiled burbot.—Boil three pounds of fish and serve with egg sauce made as follows:

Thicken one pint of milk with corn starch or flour, add a lump of butter the size of a walnut, one egg, salt, and pepper. Boil and stir briskly until flakes of egg yolk come to the top.

5. Burbot and spaghetti.—Boil about one pound of fish for ten minutes in salt water, drain, cool, and flake it. Prepare two cupfuls of boiled spaghetti. Mix two tablespoonfuls of butter, three tablespoonfuls of flour, two cups of milk, salt, and pepper, and boil until thick. Place a layer of spaghetti in a baking dish, then a layer of fish and cover with the sauce and a few slices of hard-boiled egg. Spread bread crumbs over this, moisten them with a little melted butter, and bake until brown.

6. Burbot with tomato sauce.—Prepare the fish as in the preceding recipe. Mix one-half can of tomatoes, one chopped onion, one-half tablespoonful of salt, one-quarter tablespoonful of pepper, and one clove. Allow this to simmer for ten minutes and strain through a sieve or colander. Mix one tablespoonful of butter and one tablespoonful of flour, slowly add the tomato sauce, stir until smooth, and simmer for five minutes. Fill a baking dish with alternate layers of fish and tomato sauce, and cover with a cup of bread crumbs moistened with three tablespoonfuls of melted butter. Brown in a hot oven.

7. Scalloped burbot.—Boil the fish one-half hour, remove the bones, and break in fine flakes. Rub to a smooth paste, over the fire, a piece of butter the size of an egg and one large spoonful of flour; add slowly one pint of milk until it makes a rich cream, stirring over the fire until thoroughly cooked. Add the fish, and season with salt, pepper, finely chopped parsley, a little chopped onion, Worcester sauce, etc., as desired. Put the mixture in a baking dish with bits of butter and cracker crumbs, and set in an oven to brown. Or the creamed fish may be served on hot toast.

8. Scalloped burbot.—Place two cupfuls of skinned fish cut into small pieces in a baking dish. Dredge over it one-third cup of flour, add one-half teaspoonful of salt, pepper and two tablespoonfuls of butter. Cover with milk, and bake for 30 to 40 minutes.

9. Burbot pudding.—Finely flake one pound of cold cooked fish, add four medium-sized potatoes, mashed, a piece of butter the size of a walnut, and one-half cup of milk, mixing the ingredients thoroughly. Place in a pudding dish and cook for one hour in an oven at moderate temperature.

10. Burbot rarebit.—Mix in a pan or chafing dish a teaspoonful of melted butter, a few drops of onion juice, one teaspoonful of salt, and a very little paprika. As the dish warms, add gradually one cup of milk, three-fourths of a cup of chopped cheese, and one cupful of cold finely flaked fish. To the thickening mixture add one beaten egg and one tablespoonful of lemon juice. Serve very hot on thin toast.

11. Burbot omelette.—Beat four eggs slightly and add a pinch of salt, one tablespoonful of flour, and three-fourths pound of cold, cooked fish. Place in a very hot, well-buttered frying pan, cover tightly, and cook until brown.

12. Burbot chowder.—Cut the meat from the bones of four pounds of skinned fish. Cover the bones and the head with cold water and boil for one-half hour. Fry until tender two small sliced onions and four thin slices of fat salt pork. Skim out the pork and onions and add the strained bone liquor and one quart of sliced raw potato. Cook for 10 minutes and add the fish, one tablespoonful of salt, and one-half tea-

spoonful of white pepper. When the potatoes have become tender, add one quart of hot milk, thickened with two ounces of butter and flour mixed together. Serve with crackers.

13. Burbot in sour.—Cut five pounds of burbot into pieces about 1½ inches long, without removing backbone. Steam for one-half hour and pack the pieces in an earthen jar. Take three pints of vinegar, one teaspoonful sugar, one-half teaspoonful of salt, one heaping teaspoonful of whole cloves, pepper and allspice, a sliced onion, and boil for 10 minutes. Pour over the fish and let stand until cold.

Dr. H. F. Moore is also author of Economic Circular No. 23, "The Sablefish, alias Black Cod."

To gain entrance to the best society a new fish, like a new neighbor, must be vouched for and properly introduced. Cod, mackerel, salmon, and a few other members of old and respected fish families of Europe, which came to the shore of America even before the Pilgrim Fathers, were at once recognized and accepted by the Mayflower immigrants and their successors, and there was established from among them a veritable "codfish aristocracy" of the markets. From time to time other fish have been added to the elite, but their number is still far short of the "four hundred," which probably could be included if our available aquatic food supplies were fully utilized.

Within a few years, however, the democracy of high prices has upset the old exclusiveness and has given to previously unknown or obscure fishes an opportunity to be pushed to the fore and to demonstrate that they are entitled to regard, at least equal to that accorded to those of longer standing in the community. The tilefish has established an assured position, and the grayfish is living down the reputation which it acquired as a pirate and is acquiring respectability as a fish whose acquaintance is worth cultivating.

The Bureau of Fisheries now presents the sablefish, which, for no reason of its own making, has lived heretofore under the alias "black cod." It is not a cod, and is not related to the members of that family by lineage, structure, or edible qualities. When it was discovered on the Alaska coast in 1811 the only name which it bore was the barbarous one used by the Indians, and the early white settlers and explorers, with the unconvictionality common in new communities, gave it a nickname based on superficial appearances. So long as the fish was practically unutilized the misnomer was of little moment, but now that it is entering into commerce it becomes deceptive and not only runs the risk of being banned under the pure food laws, but is actually misleading to the consumer, who may buy it under the impression that in its edible qualities it resembles the cod.



THE cod is dry-meated, while the sablefish is one of the richest and fattest of American fishes and is to be cooked differently. Its flesh is firm, white, and flaky, with a full, rich flavor, while the fats are almost gelatinous in their consistency. A high authority on dietetics in the Department of Home Economics of the University of Washington says that it "is excellent from an economic standpoint, as there is little waste, being almost free from bone and requiring very little time for cooking. It is suitable for the humblest home on account of its price and for the millionaire's table from its fineness of texture and delicious flavor."

Until now its excellence has been known to but a few persons on the Pacific coast, but the time has come when, on account of its edible qualities and low

price, it should be made known to all. It is found in the deep water off the coast from San Francisco to Alaska, and is particularly abundant from Oregon northward. It has been caught more or less freely by the halibut fishermen for many years, but has been regarded as a nuisance rather than at its true worth, because, with the characteristic American heedlessness of the value of natural resources, it has been neglected by the consumer and there has been no market for it. Millions of pounds have been returned to the sea annually, while the people who should have been using it have been clamoring for investigations into the reasons for the high cost of living. Here is one reason which requires no legislation for its correction.

The sablefish as caught averages about 15 pounds in weight, although it grows much larger. On account of its firm texture it "ships" well and is therefore available fresh far from its home in the Pacific, and frozen (just as good) as far east as New York and New England. To obtain the frozen fish at its best the housewife should buy it still "in the frost" and thaw it in cold water immediately before using.

"Barbecued" sablefish is one of the most delicious of sea foods. The fish is kippered or lightly pickled and smoked and in that condition, if kept cool and dry, will keep perfectly for ten or twelve days. As the frozen fish may be thawed and then barbecued this product should soon be available everywhere. The fish is also excellent salted, and as it does not rust, although fat, there should be a broad market for it in that state to the mutual advantage of the fisherman and the consumer.

The culinary experts whose recipes follow advise that the fish should not be allowed to stand unduly long in water, and that it be handled carefully in cooking, as the flaky character of the cooked flesh causes it to break apart readily.

All fish meals should include green vegetables, and this is particularly important with rich, fat species like the sablefish. Miss Rausch suggests the following examples of inexpensive fish dinners:

(1) Boiled sablefish, boiled potatoes, parsley sauce, spinach, tomato salad, baked apples, coffee.

(2) Fried sablefish, tomato sauce, escalloped potatoes, cold slaw, apple pudding, coffee.

(3) Baked sablefish, stewed tomatoes, celery, lettuce salad, cranberry pudding, coffee.

FRESH FISH FOR CENTRAL CANADA.

Refrigerator Car Service to be provided from Pacific and Atlantic.

OTTAWA, August 3.

The first step toward the practical consummation of plans upon which the food controller of Canada and the special fish commission have been working during the past few weeks are indicated in an announcement made last night. It is intended to provide a refrigerator car service from both Atlantic and Pacific coastal points to facilitate distribution in Central Canada of the finest fish food.

The first car, as a test under this plan, left the Atlantic coast on Saturday, August 4, loaded with fresh Atlantic sea food. It arrived in Toronto on Monday morning, August 6.

This is the first time that Atlantic sea food has been expressed right through on the refrigerator carload lot plan as far west as Toronto.

Arrangements from the Pacific coast to points in Western Canada will be made later.

FISHING VESSELS SHOULD GET BAIT.

Supply was ample but deep sea fishermen at St. Mary's Bay were refused it.

DIGBY, August 6.

In these days when every available means ought to be put forth to increase the production of our food supplies, it is not a pleasing matter to record the difficulty our fishermen are laboring under, by being restricted in that all-important necessity—bait.

The Government makes every effort to ascertain the amount of bait caught in the various weirs round the shores, and daily reports are telegraphed to the different centres giving the number of barrels returned from the weirs.

The weir fishermen are licensed by the Government to build weirs and catch herring and small fish, and though there does not appear to be any law compelling the sale of their catches primarily to fishing vessels for bait, yet it is an unwritten law, and for the most part acted upon.

Recently, cases have come under notice where this has been very flagrantly ignored; and last week in St. Mary's Bay a fishing vessel was twice refused bait, when about twenty-five and eighteen barrels respectively had been caught. The reason assigned for not selling to the fishermen was that the catch was sold to the sardine vessel. To sell for sardines is perfectly legitimate when there is an abundance of bait, and the fishermen are supplied; but it seems a wrong policy to prevent the fishermen from following their avocations for lack of bait, when it is there at hand.

The first consideration in these days of conserving production and increasing it, ought certainly to be the needs of our own men. The weir fishermen have a monopoly of bait fishing; and the vessels that go out to the banks and brave the dangers of the deep, to bring in their catches of fish so much in need, ought never to be held up for bait unless there is none available.

Now that the steam trawler has been taken off the Nova Scotia fishing ground to increase the supply of fish to be taken into the markets across the Bay, every possible boat that can go to the fishing grounds should do so; and all the help that can be afforded in providing them with the essentials should be given. Weir fishermen should willingly co-operate with their deep-sea brethren, instead of putting insuperable obstacles in the way.

Bait is the one thing absolutely necessary, and certainly the claims of the fishermen are to be advanced before sardine buyers. Something ought to be done to put this matter right at once—Halifax Chronicle.

CANADIAN TRAWLER TRIUMPH ARRIVES WITH HOLD LOADED.

Is first steamer of the Dominion in Portland.

With 160,000 pounds of mixed fish in her hold, the Canadian beam trawler Triumph, the first steam fisherman flying the flag of the Dominion to ever come to this port, arrived here recently, and tied up at Commercial Wharf. Later in the day the Triumph went to the Burnham & Morrill Company plant at East Deering to land part of the big fare of fish.

In the last four trips the Triumph has brought into port a total of 700,000 pounds of mixed fish, and previous to the trip completed here to-day, she has been going into Halifax, N.S., with her fares.—Portland Evening Express and Advertiser.

THE EVANS AUTOMATIC FISH HOOK.

 IN observing the large percentage of loss sustained by reason of the present inefficient methods used in trolling for salmon and other kinds of fish, the inventor, Mr. J. S. Evans, while employed by one of the large fishing companies operating along the coast of British Columbia, became impressed with the urgent need for a more efficient device to replace the ordinary hooks in general use; it being conceded from general observation that fully fifty per cent. of the fish caught on the ordinary hooks are lost before they can be landed on account of the hooks tearing loose from the fish in its struggles, and in such event, the fish die from the effects of being so wounded.

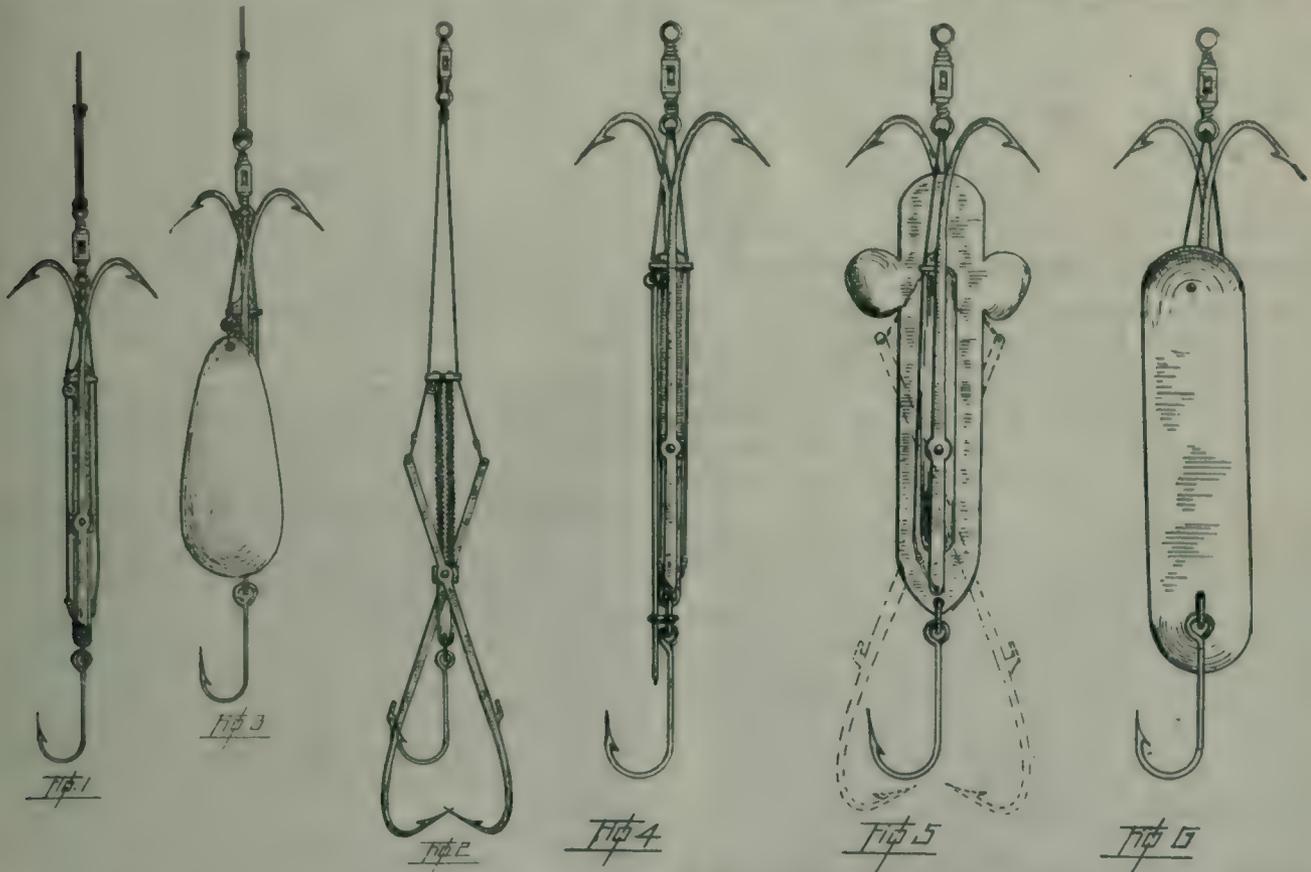
Believing that some kind of device could be created

spent in perfecting same, was for increasing the earning capacity of the thousands of men engaged in the commercial fishing industry.

The average price paid fishermen on the Pacific Coast for salmon caught by trolling has been five cents per pound up to the past two years, and this season as high as eleven cents is being paid. On the basis of five cents should a fisherman save but four fish of twenty-five pound weight in a day's fishing it would increase the value of his catch \$5, and from personal observations made, as high as \$25 per day additional can be made by substituting this hook for the ordinary hook in use.

To the scores of practical fishermen who have seen this hook, the unanimous opinion is, that it will meet their requirements in every way.

The only criticism or doubt expressed as to the



that would fill the long felt need for a better fish hook, the inventor spent over four years working and experimenting with various devices and feels that the problem has now been fully solved in the Evans Automatic Fish Hook, which has been covered by patents issued jointly to himself and A. L. Snow, in Canada, Newfoundland, United States and Great Britain.

The proportion and shape of every member of the combination has been determined by careful study and observation, while trying out the practical working of same in catching various kinds and sizes of fish.

The illustrations were made from the working drawings by which the models have been made.

Many kinds of artificial baits can be used on this device in addition to those shown and described here.

Various sizes of the different types would be in demand, ranging from smaller to several sizes larger than the cuts shown here.

The principle object of this invention and time

merits of the hooks was by one single man, and that was, that the automatic hooks might fail to operate in certain unusual conditions (which have so far failed to materialize in any practical demonstration made), but grant that such might occur one still has the fish hooked according to the best means now in vogue, that is, impaled on the bait hook.

Another important point is that these hooks will do away with the gaffing of fish in landing which detracts from the value of the fish.

As to the use of these hooks in the inland lakes and rivers, they can be manufactured in sizes to fit the requirements for those who fish for pleasure.

The inventive genius as applied to fishing devices the past half century has been along the line of more attractive devices to lure the fish, with no appreciable effort toward securing the fish after having been so lured, which the inventor feels has been successfully accomplished in the Evans Automatic Fish Hook.

BABY LOBSTERS FROM NOVA SCOTIA PLANTED.

The export of undersized lobsters from Nova Scotia to Boston is turned to good account by the Massachusetts officials who are planting them as future breed serial along the shore. The Wardens collect those "baby" lobsters from the receipts of the dealers, who are not held responsible for the contraband, and put them on board the Gloucester boat which dumps them, at stated intervals, during each outward trip. In this way many thousands of immature lobsters are liberated in New England waters every week; and as there can be no doubt about their flourishing the same as in their former habitat, the Massachusetts commission are working a good scheme for the local fishery at the expense of the provincial shippers, who are strangely short-sighted in this instance. An appeal has been made to the commission of conservation, Ottawa, for some steps to prevent the shipments of such shorts. The whole trouble arises from the fact that there is no size limit for lobsters in Nova Scotia. —Fishing Gazette.

FRENCH BUY FISH AT NEWFOUNDLAND.

French fishing operators are visiting the south coast of Newfoundland to purchase stocks of cod for shipment to France and French colonies. This is due to the cessation of fishing activities in the French islands of St. Pierre and Miquelon, lying off the southern end of this island, because practically the whole male population is either fighting in France or invalided home.

The number of French vessels which formerly came to the Grand Banks to catch cod has been reduced from several hundred to less than a hundred this year.

Several French and Spanish vessels have been chartered by Newfoundland dealers to take cargoes of fish to European markets. This is the first year in a generation that Spanish ships have engaged in this trade.

SOCKEYE PACK IS VERY SMALL.

Estimate of 130,000 Cases is Made, But Even That is Considered too Optimistic.

The extent to which the sockeye run this year has been a failure is indicated by the fact that an estimate of the sockeye pack of the Fraser River, emanating from Vancouver, places the total at 130,000 cases, as compared with a pack of 719,000 cases in the last "big year," 1913. Even that estimate is considered too optimistic by Mr. Martin Monk, vice-president of the Glenrose Cannery. In view of the fact that this is the first serious failure in a big run year, within the memory of man, many people interested in the industry feel that some effort should be made to find means of replenishing the supply, and a movement is on foot in Vancouver to have the Dominion Fishery Commission now on the coast turn their attention to this important question. It has been before them in a general way, but only incidental to the enquiry they were specifically commissioned to make.

STRAITS PEOPLE DOING WELL WITH SEALS.

Trawl Fishing Good—Ethie Returns From North.

The SS. Ethie, Capt. J. Goobie, reached Curling recently from a regular trip north as far as Battle Hr. The ship brought report that there is good sign of codfish along the Newfoundland side of the Straits Belle Isle, particularly in the vicinity of Current Island, and both bankers and shoremen are doing well; the latter, however, are somewhat hampered through the scarcity of bait. Fishermen are now setting their traps and will have all out by the end of the present week. No salmon yet reported along the coast. Lobster packers are finding lobsters both scarce and small. Seals have been numerous in the Straits and the people on the Labrador side with nets and frames have done well. This is a source of great relief to them, as they were worried as to how to secure skins for boots owing to the high prices in the St. John's market. There are a good many icebergs in the Straits, but no field ice. The Ethie experienced gales of wind and dense fog during Friday Saturday and Sunday.

LOBSTERS.

Dealers here are giving \$19.00 per case for 1 lb. Flats, 48 to a case. By the new export regulation only half of the catch can be shipped to England, the same law as applies to Canada. This will keep the price from going over \$20.00, as we shall have the States and Canada to take the balance. The catch particularly on the West and South-West coasts is much better than last year.

YARMOUTH LOBSTER CATCH AND EXPORTS.

During the season of 1916-17, there were 44,101 hundredweight of lobsters, valued at \$537,300, caught in the Yarmouth district. Of this total 14,085 cases were canned and 18,201 hundredweight were shipped in shells to the United States and other parts of Canada. The average price was \$12.18 per hundredweight. During the 1915-16 season, the catch was 60,754 hundredweight, which was valued at \$614,946. The average price during that season was \$10.12 per hundredweight.

In spite of the fact that lobsters were scarce, the past season was fairly successful, owing to the good price brought by live lobsters.

The prospects for next season are not bright, owing to the likelihood of the British embargo being continued and the scarcity of tin for canning the lobsters. —U. S. Consul John J. C. Watson, Yarmouth, N.S.

SALT.

The salt situation was somewhat relieved by the commandeering by the Tonnage Committee of 10,000 hhds. held here in merchants' stores and distributing it where wanted worse. Hons. J. C. Crosbie, A. E. Hickman, and W. F. Coaker have herein done a good piece of work. The SS. — is due Monday with 600 tons, and two sailing vessels will also arrive with cargoes within the next few days. As the trap fishery is now about over, the ill effects of the scarcity will not be experienced to any serious degree.



Canadian Oysters

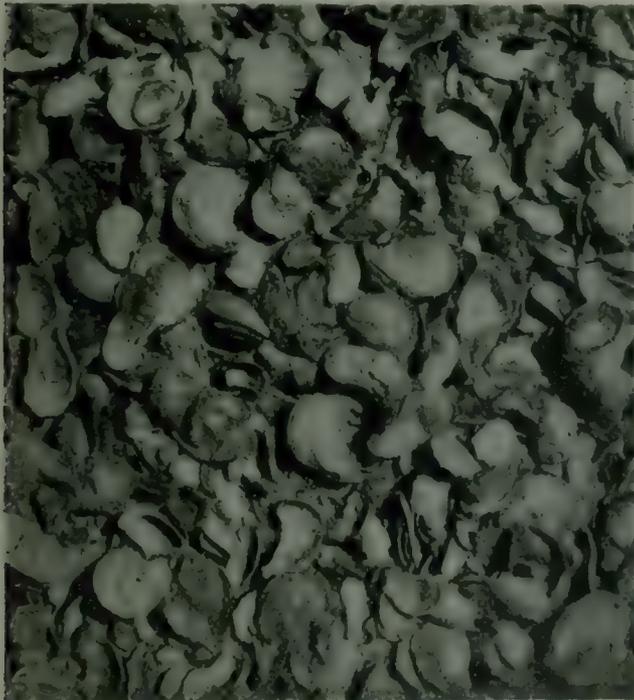
J. STAFFORD, M.A., Ph.D., Montreal.

III.

Conditions of Existence

The article for July gave an account of our two species of oysters in their adult life—their organization and activities. The article for August dealt with the mode of origin of individuals. Both cover in a brief manner the life-history of the oyster. An adult oyster spawn eggs, which develop and grow through more highly organized stages until they are themselves adult and deposit their eggs. This is the cycle of events generation after generation.

animals living in the same waters. We are forced to recognize the fact that there is another aspect to the life of the oyster besides what belongs strictly to itself, its origin, organization, activities, feeding, growth, breeding. This other aspect has reference to the external world, the surroundings, environment, natural conditions of existence. We walk over an oyster bed at low tide and find great numbers of empty shells. We dredge up oysters from a deep-water bed and we pick out a few living individuals from a great mass of dead shells. We cannot find anything like the numbers of spat in the spring that we judged were present the autumn before. Of the myriads of eggs spawned into a bay in summer we have to search to find a few representative spat in autumn. Clearly



1. Portion of an Atlantic oyster bed.

An Atlantic oyster may produce 16,000,000 eggs or more in a single season. If all the eggs of all the oysters were to develop regularly, as easily and directly as it can be stated, they would soon fill solid all the bays in which they occur. It is evident that such a condition could never be reached—the developing oysters would begin to smother and to starve one another long before the sea-water came to be excluded from the bays. Not only is this true for the oyster, but a similar condition exists for many other



2. A native oyster bed in B. C.

there are causes at work to reduce the numbers at all times of the year—causes that are not resident in the oyster itself, but exist outside of and react upon it—causes that are not only fatal to adults, but operative throughout the whole life from egg to full-grown oyster. No wonder that every female has to spawn millions of eggs each summer to keep fairly constant the relatively small number of living oysters in a bay.

In order to grasp the significance of the action of external forces upon living oysters there are open to us two methods of procedure—we can study the natural conditions under which oysters pursue successful lives, or we can experiment upon oysters by introducing artificial conditions.

In studying natural conditions we can compare an oyster-producing bay with a non-oyster-producing bay in order to determine what are the favourable conditions present in the former and absent in the latter; we can compare an oyster area in a bay with an oysterless area in the same bay; we can transplant oysters to an oysterless bay or to an oysterless area of an oyster bay and examine them from time to time to note their growth, state of health, etc.

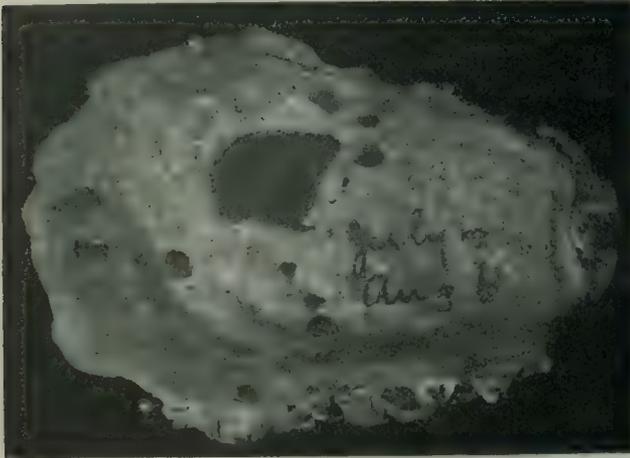
Richmond Bay, P.E.I., is the best known oyster bay on the Atlantic coast of Canada. From it originate the well-known Malpeque and Curtain Island oysters. Passamaquoddy Bay, N.B., has no oysters. The first is located on the north-eastern side of Prince Edward Island, and is an extension of the great Gulf of St. Lawrence, from which it is guarded by a series of

most effective difference is in the temperature. The enormous volume of cold water from the deep Bay of Fundy, mixing with the remaining deep water after the draining of the surface water by the falling tide, serves to keep the temperature of Passamaquoddy Bay at a low average. In Richmond Bay the relatively small exchange of warmed for only partially cooled water and the great extent of exposed beach and heated sand over which it flows serve to maintain a higher average temperature.

Geographically, Passamaquoddy Bay lies to the south of Richmond Bay and nearer to the great oyster regions of the United States. If we go to the north and select Gaspé Bay there is a closer parallel with Passamaquoddy Bay. Oysters were at one time to be found at Percé, near the entrance to Gaspé Bay, and they persisted until a still later date at places on the coast of Maine not far from Passamaquoddy Bay.

In their northern limits they have retreated to Carquette in the Bay of Chaleur, and have an interrupted occurrence down the east coast of New Brunswick, and continuing onto Nova Scotia, all around Prince Edward Island, in the Bras d'Or Lakes of Cape Breton, and sparingly on the southern coast of Nova Scotia to near Halifax. Passing over the great Gulf of Maine (including the Bay of Fundy), they begin again at Cape Cod and continue in all suitable places to the Gulf of Mexico.

On the Pacific coast the native oyster is distributed sparingly from the region of Bella Bella southward,



3. Western spat one month old on an oyster shell.

sand-dunes that restrict the entrance. The second has much the same relation to the Bay of Fundy, from which it is protected by a string of islands between which the tide finds passage-ways. The two bays are also sufficiently alike in size and shape to fit into the comparison. But here the similarity ends and the contrast begins.



TO be impressed by the difference it is necessary to see the two bays at both high and low tide. At Malpeque the rise and fall of the water is in the neighbourhood of five feet; at St. Andrew's it is about 28 feet. At both places the water may fall off great distances from parts of the shore, but at Malpeque this is due to the very slight and gradual slant of the ocean bed, whereas at St. Andrew's it is due rather to the great fall in depth of the water, for the beaches dip more abruptly into the sea. The rocks, the boulders, the sand, the mud, the colour of the beach, the clothing of seaweeds, the abundance and variety of the animals are different. In Richmond Bay a comparatively small volume of water is exchanged by the rise and fall of the tides, and there are scarcely any strong currents. In Passamaquoddy Bay an enormous volume of water is carried away or brought up in the short period of six hours, developing strong tidal currents that remove soil from one place and deposit depths of black mud at another.

The water itself is subject to differences of specific gravity and of temperature. The incoming tide-water is saltier than the outgoing, but the amount of difference depends especially upon the fresh-water contributions from the rivers entering the bays. The

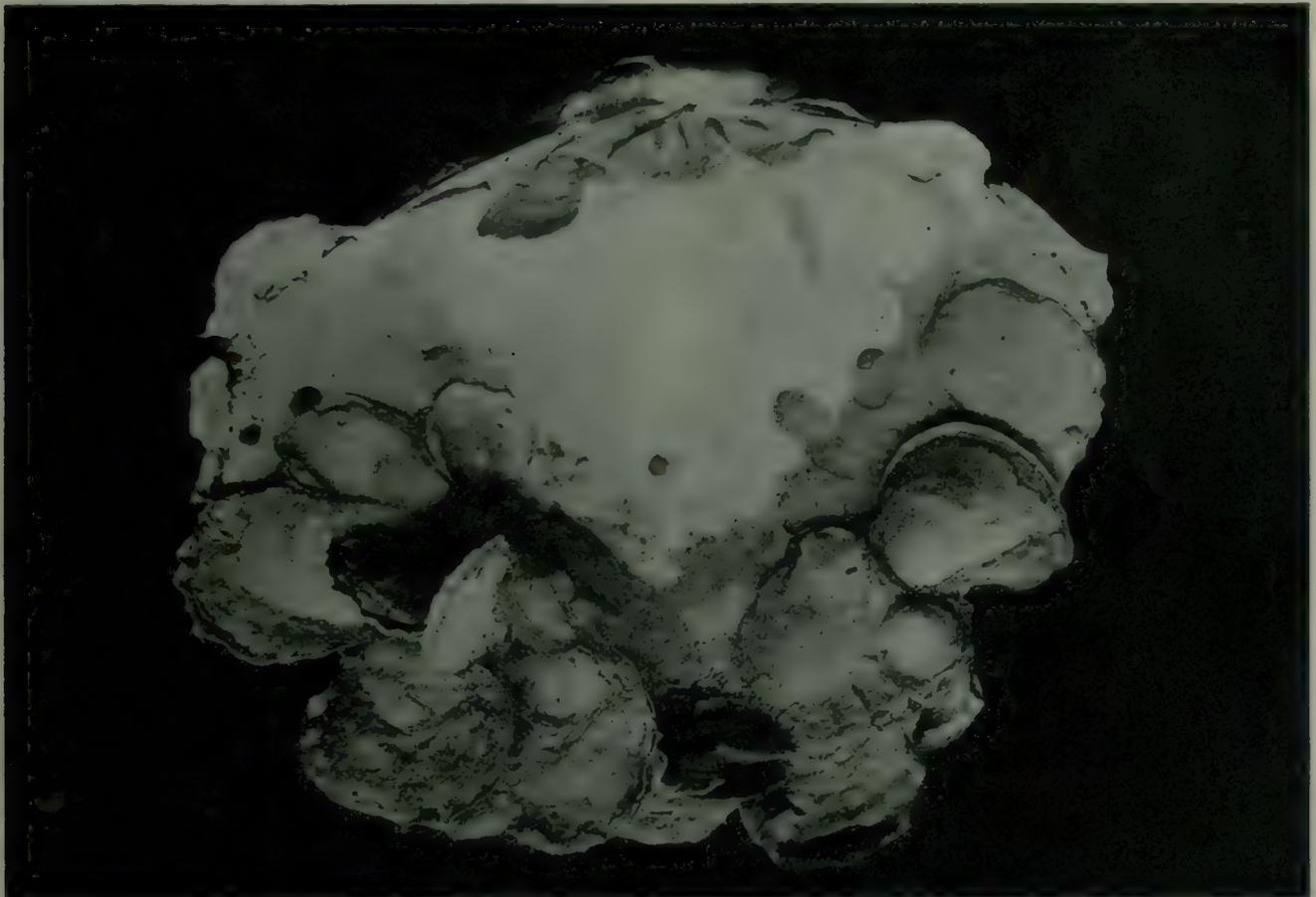


4. Spat of two months on an oyster shell.

becoming more abundant in the Gulf of Georgia and even on the western side of Vancouver Island. From these it continues into Puget Sound and along the coasts of Washington, Oregon, and California. It is not difficult to select parallel comparisons to those on the eastern side of the continent.

The distribution in a bay depends largely upon the depth and nature of the bottom, the protection against cold and rough seas, the disposal of beaches and flats, the entrance of rivers and the position of channels, the movements of sand and mud, the temperature of the water and the presence or absence of rocks, stones, shells and other hard and smooth objects upon which spat can become fixed. In Richmond Bay, P.E.I., the great sand-areas just inside from Bill-Hook and George Islands are devoid of oysters. Exposed beaches, while they may show an oyster now and again, and at spots (such as Ram Island Point), a good many, do not form the great productive areas. The latter are below low-tide, on beds of old oyster-shells that have accumulated through untold periods (Fig. 1). Some of these beds cover great areas and

manner as river systems do for larger areas of country. The substratum is not loose sand or soft mud, but of a more solid and permanent character, sufficiently firm to walk on, although sand and mud have taken part in its formation. At such places the dead shells of clams, mussels, cockles, whelks, and the like, as well as the shells of dead and living oysters, offer points of fixation for oyster larvae (Figs. 3, 4, 5). They do not form continuous beds of shells cemented together like the great submerged beds of the Atlantic coast. There are no deep-water beds on the Pacific. On parts of flats the oysters may be somewhat aggregated but free—the original small, thin, soft shells to which they were attached having crumbled away. For the most part the oysters on natural beds are much scattered.



5. Spat of largest size for the first year on a clam shell.

several feet in depth of dead shells, infiltrated with sand and mud or other deposits of the time when they were forming. The living oysters are on the surface of such beds, mostly attached to the next layer below. The best beds are 8 to 20 feet below the surface of the water, and methods of fishing—as by tongs—bring up relatively few living oysters mixed with a greater amount of dead shells. Such are the Curtain Island beds.

In Boundary Bay, B.C., the sandy and gravelly beaches to the east of the main channel and the great sand and mud flats to the north and north-west of the channel of the Serpentine River are bare of oysters. The naturally occurring oysters are to be found at and just above low-tide limits, about the mouths and following up along the edges of sloughs (Fig. 2), that cut through the exposed flats in much the same



AN analysis of the facts of natural distribution points to certain primary essentials in the environment of the oyster:—

That oysters do not live on the land, in the air, in fresh-water ponds and rivers, but do in the sea, proves that they need the **salt water** of the ocean. That oysters do not live floating on or in the water or on shifting sand or non-supporting mud, shows that they should have a somewhat hard **substratum**.

That oysters grow better near sea-weeds and black mud (largely the product of organic decay) than on clear gravel and sand beaches, calls attention to the necessity of **food**.

That oysters do not occur in polar seas, but do in temperate and warmer zones, points to the requirement of **heat** or warmth.

The deductions from the observations of natural oc-

currences can be verified and carried to details by experiments. If oysters are planted on sandy spots they are likely to get drifted over and smothered. If they are put on soft mud they are in a favourable place for obtaining food, but are liable to settle down into the mud and become smothered. They can not dig their way out like a cockle, or live buried and still communicate with the clear water above by means of siphons like a clam. The fixation of an oyster larva is a means of protection against such accidents after the loss of its locomotory organs (velum and foot). To be successful, transplanted oysters have to be put down on bottoms and in bays closely resembling the best naturally occurring oyster areas. They may be thickly disposed (Fig. 6), looking very much like beds of transplanted eastern oysters (Fig. 7.)

Experiments on adult oysters show that when left exposed to the air, or when placed in river, pond, well

practicable for our purposes. Their small size and the exposed position of their swimming organs permit instant action of the water, and make observation easy. Youthful and spat oysters are more like the adult and unsatisfactory. Embryos and eggs are too quiescent to be of great value for such experiments.

Two things were made use of—the larvae and the rain-water. Two sets of observations can be recorded—the one referring to the larvae themselves as judged by their behaviour, the other referring to the rain-water as a medium. The first supplements our knowledge of the activities of the oyster, the second contributes to our knowledge of its environment.

Withdrawing most of the rain-water by means of a pipette and transferring sea-water to the watch-glass results, in a few minutes, in the larvae again being restored to activity. If they are left longer time in rain-water, it takes longer to restore them in sea-



6. Western oysters re-planted in B. C.



7. Eastern oysters transplanted in B. C.

or rain water, or buried in sand or mud, they will not live long. If the weather is cool they may live about a month, otherwise they may die in somewhat shorter time. Adult oysters are resistant. In experimenting we cannot wait so long for results. Younger stages are more delicate and less protected. They serve our purposes better. For many experiments the larvae of the British Columbia oyster are all that can be desired, and are easily obtained in the proper season.

Experiment: Some large active larvae from the branchial cavity of *Ostrea columbiensis* are transferred to a watch-glass of rain water.

Result: The larvae cease swimming on the instant and remain quiet as if dead.

The larvae give much quicker and more decided results than the adult, and as a consequence are more

water. If exposed to rain-water for fifteen minutes, few or none can be revived. All forms of fresh-water: rain, pond, river, spring, well and distilled waters act similarly.

Larvae (and younger and older stages) are liable to exposure at times to fresh water from rain, rivers, drainage, melting snow of the mountains, glaciers, etc. One hears and reads of river oysters. This is due to a failure to grasp the real conditions or a loose and unscientific mode of expression. We have no river oysters. There are oysters living in estuaries, which are salt water arms of the sea—not fresh water. In some districts it is customary to speak of tidal currents, between the mainland and islands or between two islands, as rivers, where they have nothing to do with rivers.



FRESH water is death-dealing to oysters; sea-water is life-sustaining. But sea water may be somewhat diluted with fresh water and still remain life-sustaining. That is what happens at the mouths of rivers and in most bays.

The rising tide generally forces sea water up the channels leading to rivers and the river water flows over its surface. The water is fresher on the surface and saltier on the bottom. Sea water from a distance off shore, out of the influence of rivers, has a specific gravity of 1.025 (or thereabouts), the S. G. of fresh water being 1.000. As the tide falls in a bay the layer of fresher water on top is lowered along the beaches and over the flats, washing and scouring the surface. This, for one thing, prevents many sea animals from living in these places. Animals, like the oyster, that have become habituated to a varying salinity, may prefer it, but there is a limit to their ability to withstand both decrease and increase of salinity. Experiments show that the degree of S. G. giving best results is just above the medium between sea and fresh water, i.e., about 1.013. It must be noted that there is a difference between salinity and specific gravity—the latter may be due to other substances in solution besides salt (common salt). A solution of salt of S. G. 1.025 is not life-sustaining to the oyster. The writer has made up artificial sea waters from distilled water and pure salts, in kinds and quantities as they occur in sea water, that are just as good as, if not better than, natural sea water.

Another necessary constituent of sea water, from the standpoint of the oyster, is air. Stagnant sea water is much inferior to aerated sea water as a life-sustaining medium.

Sperm, as shown by experiments, are more sensitive to changes of media than larvae, and may be used to test the effects in a similar way.

Fertilization is the most exacting of all the methods of testing and comparing media. Fertilization can be effected in artificially compounded sea water.

Temperature is the most important purely physical attribute of the sea water in which oysters live. If larvae are placed in sea water in a test-tube and stood in a hole bored in a block of ice kept in a cool place, and examined from time to time, it will be found that as the temperature falls to near the freezing point the larvae become inactive. Ice may be frozen around them and they may be thawed out and swim about again. But after a certain prolongation of the freezing they are permanently injured or killed outright. They can not be frozen through and again restored to continued active life.

A study of temperature with reference to fertilization and development throws a great deal of light on the breeding of oysters. At 2° C. fertilization is not effective. If kept at this temperature for a time and then brought into a warmer one, a few may begin to develop, but are liable to soon go to pieces. If kept a longer time at 2° before exposure to moderate warmth, none will develop. At 10°C, they do not develop, but when warmed to 15°C they begin. If kept at 10° for 24 hours before being warmed, a few will begin to develop, but will soon disintegrate. At 25°C development is rapid, but few cases are regular and free from abnormalities. Forced development does not contribute to regular and healthy growth. At 15°C it takes 5 hours to reach the 2 to 3 celled stage—at 25°C it takes only 2 hours.



IT now becomes clear why breeding takes place in spring and summer, and why rate of development and growth vary at different places and different times. At Crescent Bay, B.C., the temperature of the sea water for 1916 gave the following readings:

March 15, 1916	6°C
April 1	8.5
April 15	11.5
May 1	14.5
May 15	15
June 1	17
June 15	20
July 1	19
July 15	20
Aug. 1	22
Aug. 15	20
Sept. 1	19
Sept. 15	17

The distribution of eggs is similar to that of the oysters spawning them. Similarly with embryos. The distribution of larvae is at first the same, but, as larvae are free-swimming, they may, while in suspension, be carried to other areas by the drift of the tide or by tidal currents. When full-grown larvae begin to set and become spat, the chances are that they will find the most suitable conditions in the same regions as their parents, and that most of those which go adrift into other less favourable places will be lost.

THE FISH OF LILLABELLE LAKE

Two years ago Lillabelle Lake was well stocked with goodly fish which furnished the angler with very satisfactory returns for a few hours' fishing. It was a source of pleasure to numbers of Cochranites who appreciated the results from a few hours spent with rod and line.

Then the greedy law-breaker with his nets appeared on the scene, and fish in large quantities were sold in town and country. But this was not all! The supply was much greater than the demand, consequently the surplus had to be disposed of, which was accomplished by the simple process of bagging them up in old sacks and dumping in the adjacent creeks: there they were left to rot and befoul the water which settlers use in many instances. Eight large sacks of decomposing fish it is said were discovered a year ago in one creek.

Several times settlers notified the Department and a man was sent to put a stop to these depredations, but as the game goes merrily on, it is presumed the profit is worth the small risk. Nets are still in evidence, and it would seem there is still some profit in it, but the unfortunate angler may fish with all the fervor of the renowned "Sir Isaac" and be equipped with the outfit of the complete angler but his efforts will be in vain. "The Hun has done his work."

H. W. P.

DRAGS BIG FISH FOUR MILES.

Arkansas City, Ark., Aug. 11. — Unable to pull a 75-pound catfish from the Arkansas River dam. Bloomer Aleln, an Arkansas City fisherman, chained the fish and dragged it through the river to this city, a distance of four miles. When he reached the city several men assisted him in pulling the fish out of the water,

Fisheries Administration in England

C. McKAY.



THE Fisheries Administration of England presents the virtues, and defects, inherent in the whole scheme of English public life. The English are a peculiar and perhaps a chosen people. No nation possesses a greater fund of scientific knowledge and technical skill; yet few people are so unscientific in their attitude to questions of public interest. Old Customs die hard in England; individualism, though outlawed by modern conditions, remains the keynote of the Englishman's character. To a certain extent England is still a collection of feudal principalities; a nation of parishes. Local self-government is nearly as much of a fetish as it was in the days of the Saxon, when the folk-meet settled all public affairs. English as she is spoken in this country is a continual source of amazement to the Canadian from the backwoods. I don't know how many dialects were spoken around the tower of Babel, but there's a lot in this land.

Thus it is, perhaps, that England, while it has for years, had a well organized central administration of fisheries, has permitted local organization — legally subordinate to the central power—to control the fisheries and adopt rules and regulations not always compatible with the general interest. England and Wales have for Fishery Administration purposes been divided into 11 districts. Each district frames and enforces its own regulations. True, the central administration has the power to reject or revise these regulations; but naturally, England being constituted as it is, the central administration has rarely exercised its authority. Naturally, too, the district adopted regulations which it considered to be in its own interest, without worrying as to what might be the interests of the fishing industry as a whole or the nation in general. This was proper enough when the district catch found its market near at hand. But the steam trawler and railway enterprise have created a revolution; the Grimsby fishing industry is no longer only interested in Grimsby and neighboring towns—it is interested in the market possibilities of the nation as a whole. The Grimsby dealer may find himself up against ancient regulations that prohibit or render unprofitable the sale of his fish in districts where the consumer would be glad to have them at a reasonable price. At the same time these districts may have a super-abundance of certain kinds of fish which the Grimsby district would offer a market for at reasonable prices. This may be a crude statement of the situation. All the same there is abundant testimony to the contention that the absence of uniformity in district regulations operates to the disadvantage of the fishing industry as a whole, and to the consumer, too.

That a modification of the system of administrative control, adapting it to the revolution in the fishing industry, was necessary has been recognized in England for some time. A year or so before the war a Royal commission appointed to investigate the fisheries question made some recommendations on this subject. It recommended that the Central Fisheries ad-

ministration, instead of being a subordinate department of the Ministry of Agriculture should, owing to the importance of the interests committed to its charge, be placed on the same status as the Department of Agriculture, and have its chief raised to the rank of a permanent secretary. It was recommended also that the central administration should exercise its authority with a view to promoting greater uniformity in the regulations, and to be careful before sanctioning local variations that such variations were not shortsighted and incompatible with the general interest.

With a view to making the principle of centralized control more readily operative the Commission advised that the number of fishing districts in England and Wales be reduced to four or five, and that each district should have at its head a resident inspector, directly responsible to the central body, and in close touch with the local fishing interests and fishermen. It also suggested that the district committees, exercising in practice legislative function, should be reconstituted as advisory commissions, their members to serve without pay. They were to confer with the district inspector, discuss questions of technical and commercial interest, and generally review the work of the district.



AMONG other things, the Royal Commission recommended that the administration should be able to take action to prevent the extinction of threatened fisheries; that it secure more control of the development of oyster parks, and set in motion measures to prevent their contamination; that it continue on an increased scale the scientific studies on the practice of fishing and preparation of the product for the market; that it collect and disseminate among the fishermen information concerning the fisheries; that it organize a more extensive programme of technical education for fishermen; that it undertake a propaganda among the fishermen to educate them to the advantage of the principle of co-operation in connection with loans and the sale of fish; that it develop and improve its system of statistics; that it take measures to secure the establishment of a fund to improve existing fishing ports and construct new ones; that its budget be made a complete charge against the public treasury, instead of a partial charge against local bodies; that it publish the results obtained by the installation of motors in fishing boats with a view to encouraging this practice, and when possible to make loans to co-operative societies of fishermen to permit the purchase of motors.

The Fisheries Administration maintains a number of vessels and a considerable personnel for hydrographic and scientific research work. The direction of this work is subject to the supervision of a consultative committee composed of eminent scientists who meet frequently to consider reports. The Administration also makes grants to scientific bodies engaged on local investigation and experiment in connection with the fisheries. In addition it takes its share in the work the International Council at Copenhagen is doing in respect to the exploration of the North Sea and adjacent waters.

PRINCE EDWARD ISLAND FISHING.

CHARLOTTETOWN, P.E.I.



ABOUT 50 per cent. of the lobster packers on the Island are taking advantage of the extension of the season for one month, Aug. 11th to Sept. 10th, and about forty per cent. of the traps are out.

The regular season for the greater part of the Island opened on April 25th, and closed June 25th, but in a small section extending from Cape Traverse to West Cape on Northumberland Strait the season opened May 24th, and closed August 10th. As the extension applies to the whole Province, the fishermen in the latter section, simply kept on fishing, and every factory is in operation. On the north side of the Island, however, from New London to East Point, all are closed with few exceptions. From Souris to Murray Harbor almost all have re-opened, and along the rest of the coast west of New London about half.

All the factories at Rustico, one of the most important fishing centres of the Island are closed, and the fishermen are engaged in catching cod, which pays them better at this time of the year.

There is a difference of opinion as to the effect which the extension will have upon the lobster industry as a whole.

This Spring the total catch from the Island was about sixty per cent. of that of the previous season, and was about 36,000 cases. One argument used in favor of the extension was the shortage in the catch. If the second season will bring up the whole season's catch to a normal one of an average season, it is claimed that no injury will result.

A number of packers say that as this is the first time fall fishing is being tried they will wait until the season closes, before they express themselves regarding the advantages and the disadvantages of the extension.

A leading packer in Tignish says that he does not anticipate a large pack in that section, the general opinion being that the fish will be caught up in a week. At the time of writing fair catches are being handled, but it will be very strange if these can be continued. In any case, he says, the extension is bound to injure the Spring's fishing. Some packers contend that the extension should not have been granted, because it establishes a bad precedent and the strictest adherence to the regular season is essential to the conservation of the lobster. Others use the argument that the lobsters are now closer in shore, and as the weather in September is liable to be stormy, considerable damage to gear may occur. No one holds the view, however, that the catch this fall is likely to be such as to seriously affect prices.

Shortage of herring, which is most commonly used for bait, is a factor to be reckoned with in the fall fishing, but codfish heads are being used as a substitute with good results.

Codfishing is carried on to a considerable extent in some sections, especially in Rustico, Souris and other points. The Gorton-Pew Company of Gloucester, Mass., have established a branch business in Souris, and the indications are that other large firms from the United States may follow their example. Canning cod is being carried on, a new factory for that purpose having been opened at Morrell by R. N. Cox & Company. A new departure with respect to the fish industry this fall was the starting of a motor truck

service between Rustico and Hunter River Station. This will be of much advantage to the fresh fish trade.

Once the car ferry commences running, and the gauge of the Prince Edward Island Railway is standardized, the fresh fish industry should receive a great stimulus, because shipments can be sent through in cold storage from any point on the Island to any point on the mainland railways without rehandling or breaking bulk.—MACDONALD.

PRINCE RUPERT NOTES.

While there has been general lamentation on the part of those connected with the salmon fishing industry on the Pacific Coast over the falling off of the sockeye salmon, reasons for hope and congratulations have appeared as far as the Skeena spawning outlook is concerned. Never since the spawning grounds have been patrolled has there been as good a supply of sockeye in the upper waters of the river as there is this year.

Stewart Norris, the Fishery overseer, has returned from the headwaters of the river where he inspected everything connected with the stocking of the lakes and streams. To his knowledge, for over ten years there has not been as many fish reach the upper waters as this year. The reports of those who were acquainted with the conditions before that, is that this is a most favorable year as compared with those since fishery began in the river. It is safe to say that the present outlook is the best as far as the stocking of the spawning grounds is concerned for the past twelve or fifteen years.

Under the four year cycle which constitutes the life of the salmon there is therefore a splendid outlook for the year 1921 as far as sockeye are concerned in the Skeena. The season's results in this respect will therefore afford excellent scope for the study of conditions on the part of those who are connected with the fishing industry so as to ascertain what were the contributing causes for this large stocking of the headwaters. In this way some rules may be devised that will assist in future in the keeping up of the stock of fish.

Another feature connected with the conditions found on the spawning grounds is the fact that the fish that have arrived as far as the waters of Babine Lake are in good condition physically. They have made a good run to the grounds and are not completely exhausted.

It is held as likely that the early run of sockeye got safely past the fishing areas at the mouth of the river. This was due in no small measure to the fact that there was not nearly as much net fishing for spring salmon as in former years. Trolling has become the accepted method of taking the springs, leaving the gill net fishing practically until the sockeye season is legally opened. While spring salmon nets would not take the sockeye, yet it is more than likely that the fishing operations in the river may have the effect of diverting the sockeye from their run up the river until a later period when they are more ripe and therefore do not stand the long run as well, reaching the beds in an exhausted condition.

The season as far as the Skeena River is drawing to a close. Some of the canneries had closed up before the end of August and others were to follow shortly, as soon as the cans on hand were filled. With

a poor season on the Fraser and elsewhere there has been a constant shipping of cans from these canneries that have had a very short run and a light pack. For this reason there has been a rather long extended season on the Skeena for canneries that are owned by corporations that have them on the Fraser as well.

The pack of sockeye has not been a large one on the Skeena this season. It will just about reach the same figures as last year—about 61,000 cases. This is about half what a normal pack of this variety should be for this river.

But while there has been a short supply of sockeye, the run of humpbacks has been very large. There has been no difficulty in filling all the surplus cans with these cheaper fish. There is now a good run of cohoes which are regarded as a most valuable fish. These are selling to the canners and the dealers at fifty cents each on the trolling grounds.

It will thus be seen that the pack of the Skeena will be a full one, although the sockeye, the most valuable fish that is obtained, has not been as good a run as it should be.

MANITOBA NOTES.

The season for fishing whitefish on Lake Winnipeg closed 15th August, and the total quantity allowed under the Department of Fisheries regulations is reported as having been taken this season. The fishermen have had a very successful season and they are all making active preparations for the fall fishery, which opens in a few weeks. The demand for Lake Winnipeg whitefish, acknowledged by the most critical to be the finest whitefish in the world, increases, and with the added demand for fish of all varieties, it is expected that this delicacy will be found in all the principal markets of the continent before very long. The regulation by the Food Controller is being observed throughout the principal parts of the province, and the fuller introduction of fish into the menu of all the leading cafes, clubs and hotels in Winnipeg is already noticeable.

The Town Council and Board of Trade of Selkirk, have forwarded a resolution to Col. Geo. H. Bradbury, the member for that district in the Federal House, protesting against the removal of the fish hatchery from Selkirk. It is contended that the Selkirk Hatchery has served a useful purpose and naturally the business interests of the fish town of Selkirk object to the removal of the hatchery.

The fishing station of the Northern Fish Company, Ltd., at Black River, was burned down some time ago and about \$2,000 worth of fish totally destroyed. The entire plant was destroyed, and the fishing operations there somewhat handicapped until the different outfits were removed to another station. However, the contractors are busy erecting a new plant in order to have everything in order when the season opens next year.

The many friends of Mr. W. J. Guest, the pioneer fish merchant of this province will regret to learn that he has been confined to the General Hospital for some time, suffering from a serious case of blood poisoning in his right hand. He has had a bad time with the hand, but at time of writing is making progress and is looked for around the warehouse in the near future.

Fishing for the fall season has commenced on Lake Winnipegosis, but it is impossible to say just how this will turn out as the first catch is only due—judging by the demand for nets it would seem as if the slogan of the fishermen for 1917-1918 will be "Produce More Fish."—More power to the men at the nets.

BRANDRAM-HENDERSON, Limited MARINE PAINTS

Recognizing the great future of the shipbuilding industry in Canada, Brandram-Henderson, Ltd., manufacturers of Paints and Varnishes, have organized a new department in their business, known as the "Marine Specialty Branch."

One of the earliest efforts of Brandram-Henderson, Ltd., was in the manufacture of paints, compositions, enamels and varnishes, especially suited for marine work. "Anchor" Marine Paints were among their



Jas. G. Lorriman.

first products, and the sales of their products in all parts of the Dominion will now be directed by the new department.

James G. Lorriman has been appointed manager of the Marine Specialty Branch, with headquarters at Montreal. Mr. Lorriman was, for four years, sales and advertising manager of the Metal Shingle and Siding Co., Preston, Ont., and was connected with their Montreal and Toronto offices, for nine years. He has been manager of "Hardware and Metal" for the past six years:

This new department marks another stage in the growth of Brandram-Henderson, Ltd., who, originally covering the Maritime Provinces only, are now represented by factories or warehouses, in nearly all important Canadian cities.

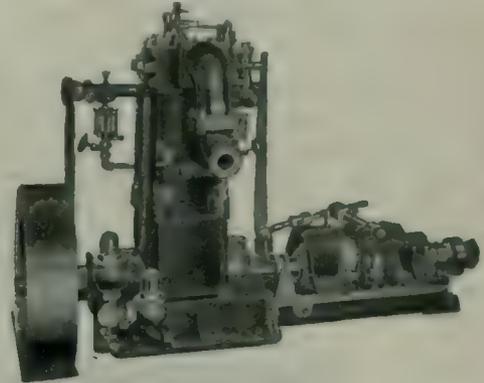
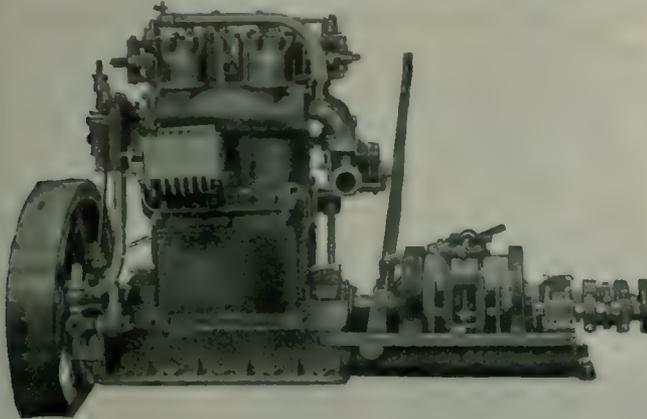
THE MANUFACTURERS OF THE "FRISCO STANDARD."

Many good things have come out of the West and especially is this true in the gas engine field. The heavy duty gas engine for commercial service originated on the Pacific Coast, and has been developed on that coast to a greater degree than anywhere else in America or the world. Probably no other motor manufactured is so well-known for work boat service as the "Frisco Standard" engine made by the Standard Gas Engine Co., of San Francisco and Oakland, Cal.

The Standard factory is a first class fully equipped modern plant of very large capacity, splendidly situated in an ideal manufacturing centre on the Oakland side of the San Francisco Bay, having both rail and water transportation facilities.

Drafting room, pattern shop, foundry and machine shop, engineering, construction, testing, painting and shipping departments are all very carefully organized and thoroughly systematized, being the direct result of modern efficiency methods.

A shipyard and boat building establishment, oper-



Special attention of the readers of this magazine is called to their advertising announcements and to the remarkable claims that they make for the service and reliability of this engine.

The history of the growth of the Standard Gas Engine Co. is an interesting one, and the popularity to which this engine has attained in recent years is equally remarkable.

The Standard Gas Engine Company commenced business as a co-partnership under the title of the Standard Machine Works in San Francisco, in 1899 and

ating in connection, has deep water frontage, private dock and ways.

Frisco Standard Marine and Stationary engines are built in sizes ranging from 4 up to 275 horse-power. Marine cargo hoists are built up to 16 horse-power. Direct connected electric units are built up to 10 horse-power.

The Frisco Standard engine in design and construction is a development—the result of the application of years of experience to a fixed idea. Its neatness of design, coupled with its simplicity of construction,



in June, 1901, just two years later the business was incorporated as the Standard Gas Engine Company, since which time it has enjoyed a very rapid growth.

The officers of the company are: President, G. W. Emmons; Vice-President, W. L. Hughson; Secretary, J. H. Clayton.

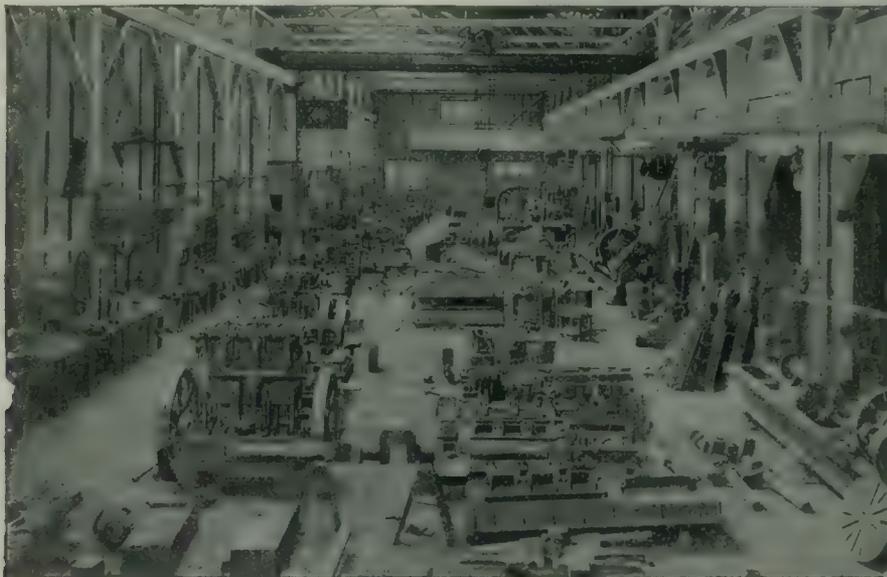
its durability, resulting in low cost of maintenance, its never failing dependability, and its remarkable fuel economy, combine in one engine, points of desirability attained in no other.

Many special features of merit are claimed for Frisco Standard engines over other makes which, in many

instances are original, as, for instance, the massive construction necessary for normal propeller speeds and diameters; the over-head cam or timing shaft with valve in the head reducing the number of moving parts to the minimum while giving positive action, greatly economizes fuel and increases the power. All reciprocating parts, wrist pins and crank pins are protected by forced lubrication insuring long and continuous service and minimum wear.

Reserve gears recently developed for the Frisco Standard Marine engines will give the same speed ahead or astern, and will not cause any thrust or stress on the propeller, crank or crankshaft when in operation at full power.

The Frisco Standard engines, propellers, propeller shafts, bearings, and water circulating parts are especially adapted to marine service on the Pacific Coast. All engines are designed for slow speed in R.P.M. which allows for a formidable wheel that will stand great abuse in the ice and along shores where landings are made in the open roadsteads; and on rock shores where lighter and higher speed propellers are not practicable.



The heavy correct base construction, the long, carefully made bearings, the large crankshafts, the long connecting rods of steam engine type construction, the long pistons, and many other features, all prove, without question, that the Frisco Standard demonstrates in the highest possible degree, a true combination of theory and practice.

The Frisco Standard engine has been exhibited in competition only three times: At the California State Fair it took first prize as the best marine engine; at the Alaska-Yukon Exposition at Seattle it took first prize as the best marine engine; and at the Panama Pacific International Exposition at San Francisco it took the Grand Prize as the best marine engine.

In connection with the winning of the Grand Prize at the Panama Pacific International Exposition it is interesting to note that the international Jury of Experts, drawn from all four corners of the earth, held that the Panama Pacific International Exposition, being a World's Fair, its exhibits must be measured by World Standards. Accordingly, in arriving at their decision, they took into consideration every

known engine, no matter in what country built, and irrespective of whether exhibited or not.

Therefore, by the winning of the Grand Prize, the Frisco Standard Engine stands adjudged as the world's best, in the highest court ever convened to pass on the relative merits of all engines.

In many isolated districts of the World Frisco Standard engines are the **only** means of communication, and the service they perform is as unusual as it is indispensable. For instance:

Mail is delivered by contract with the postal authorities, over regular routes, by Frisco Standard propelled mail boats.

Marriages and christenings are conducted, and religious services held on board Frisco Standard propelled missionary vessels, which regularly ply prescribed waterways, for this purpose.

Wireless service, government and private, on both land and sea, is maintained by the use of Frisco Standard Engines.

Life boats on ocean liners are regularly equipped with Frisco Standard Engines. (The passengers and crew of the SS. "Aeon," wrecked on July 18th, 1908,

on Christmas Island—a desert island in mid-Pacific Ocean—were saved alone by means of a Frisco Standard motor-equipped life boat, which a volunteer crew navigated close to 200 miles on the Pacific Ocean to obtain succor).

Marine hospitals (motor boats so equipped), are propelled by Frisco Standard Engines.

Floating grocery stores and butcher shops propelled by Frisco Standard Engines are quite common.

Universities are even using Frisco Standard Engines as demonstrators, in their mechanical engineering courses.

"Somewhere in France" Frisco Standard Stationary Engines (similar to our marine type, but without the reverse gear) are to-day doing their bit for the Allies, operating trench digging machines.

More Frisco Standard Engines are used in the world's fishing fleets than any two other engines combined.

More Frisco Standard Engines are used in passenger service, than any other.

More Frisco Standard Engines are used in freight

service (both coastwise and inter-ocean) than any other.

More Frisco Standard Engines are used in tow-boat service than any other.

The Frisco Standard Engine has been universally adopted for use in all departments by the United States, as well as the following foreign governments:

The Dominion Government of Canada.

The New Zealand Government.

The Australian Government.

The French Government.

The Fijian Government.

The Mexican Government.

The British Government.

Frisco Standard Engines have a steady call in the following foreign countries: Peru, Chile, Nicaragua, Samoan Islands, Society Islands, Greece, Columbia, Argentine Republic, Mexico, Panama, Guatemala, Siberia, China, Australia, New Zealand, Canada, Fiji Islands, and Japan. The most remarkable feature of the foreign business enjoyed by the Standard Gas Engine Company is the fact that we have never sent out a travelling salesman or representative soliciting this business, it has all come to them, being the result of their established world-wide reputation.

Frisco Standard Engines successfully operate on gasoline, benzine, kerosene, alcohol, solar oil, "tops" and gas oil. The fact that they use the low grade oils

with no perceptible loss in power and efficiency while performing with the same reliability as when burning gasoline or benzine, has greatly added to their usefulness.

Frisco Standard Literature of Immense Technical and Educational Value.

The Standard Gas Engine Company have just issued the "Frisco Standard Book of Boats," illustrating vessels equipped with the Frisco Standard Engines. This book is the most comprehensive and interesting piece of literature that was ever published. It contains over 200 illustrations and shows 184 boats of every kind and description equipped with motors made by this company. It illustrates a variety of types and range of service and territory which includes almost every kind of work or pleasure boat in use in any of the waters of the world.

We suggest that readers of Canadian Fisherman send for this book before the supply is exhausted, mentioning that they are readers of this journal.

It has an immense technical and educational value to any one who is looking for any kind of a boat as it summarizes the requirements and shows and describes the models that experience has proven to be best suited to all kinds of conditions and service, and no present or prospective owner of a commercial motor boat can afford to be without it.

NEW FISH DISPLAY CASES

With the increasing demand for fresh fish to take the place of, and conserve, our meat supply, the retail dealer is finding that one of the outstanding obstacles in the past in the way of increased sales was the unattractive manner in which fish are displayed, and he is now hastening to improve his store with proper receptacles and cases.

The firm of John Hillock & Co., Limited, of Toronto, manufacturers of the well-known line of "Arctic" refrigerators, have decided to place this line on the market, along with a full line of their different sizes and styles of "Arctic" fish cases, so that the needs of every class of fish dealer can be supplied promptly. The Canadian Fisherman is always desirous of intro-



With a view to inducing the retailers, in their own interests, as well as in the interests of their customers, to use an attractive, and also highly efficient method of displaying their fish, the Fisheries Department of Canada decided to prepare a complete plan and specification of an attractive and comparatively inexpensive refrigerator case, or silent salesman.

ducing to its readers lines which will improve the fishing industry in general, and to that end is illustrating here both the "Government" fish case, and one of the other designs manufactured by this firm.

The "Government" case is 2½ feet wide, 5 feet long and 10 inches deep inside, and is lined with sheet zinc, with a one inch dead air space between it and

the sides of the case. The bottom of the lining is sloped to a trap drain installed in the lowest corner, which will carry off all water from the melting ice, etc. The top of the case, which has a slope of 4 inches downwards towards the front, in order to make the display of fish more easily seen, is made in two sashes $1\frac{3}{8}$ inches thick. The sashes are fitted with two thicknesses of ordinary sheet glass, having $\frac{1}{2}$ inch dead air space between the sheets. The second case illustrated is 54 inches x 24 inches x 15 inches. Legs 18 inches high. It is made of best American plain oak, with extra lining of tongued and grooved sheeting and waterproof paper; lined with heavy galvanized iron. The partition is removable. It has a slatted rack to protect the bottom, allowing the water to drain off. Plate glass is used in the sash.

John Hillock & Co., Limited, has prepared specially for fish dealers a fully illustrated folder on their different size fish display cases, which they will be glad to send upon request. Wholesale dealers are also invited to write for prices on quantity lots.

St. Andrews, N.B., Sept. 10th, 1917.

"Canadian Fisherman," Montreal, P.Q.,

Dear Sir:—While reading with considerable interest the very lucid and informative paper on the "Atlantic Biological Station," in your issue of August last, I noticed one statement which with your permission I desire to amplify.

On page 307, your correspondent writes. . . "The sardines after they have been sealed in the tin are subjected to 129 degrees centigrade of heat for an hour and a half in order to kill all the micro-organisms contained." The temperature quoted is adopted in certain canning factories, but the more usual method in vogue is the bathing of the cans in boiling water, the time of exposure varying in the different factories from one and a half hours to two hours. As to the most desirable temperature and time of exposure to be advocated, my work is not as yet sufficiently complete for a definite statement to be made.

I am quite sure that you will welcome this slight amplification, for the further statement on page 307 that "Apparently the bacteria that cause the swelling are immune to this treatment," must necessarily be read with due regard to the various temperatures adopted by the respective canners. Further, so many factors are involved, that for the present this latter statement should be accepted in a qualitative and tentative sense. I am,

Yours faithfully, WILFRID SADLER.

September 5, 1917.

"The Canadian Fisherman," Montreal, Canada.

Dear Sir:—An article on the sardine industry which appears in the August issue of your magazine has been called to my attention. The article is interesting and instructive, but inaccurate in one detail, and I feel that in justice to the Booth Fisheries Co., of Canada, Ltd., you will be glad to correct the statement, which appears at the head of the second column on page 314, which would lead your readers to believe that they cannot purchase a Canadian packed can of Sardines and receive first-class quality.

We have been operating a plant at Chamecook for the past two years, which produces a quality second to none put up anywhere in the world. Each lot of fish is the product of Canadian fisheries, caught in Canadian weirs and brought to the factory in Cana-

dian boats, and then packed under the most careful processing and sanitary methods, in the largest and most cleanly sardine factory in the world, which is located in St. Andrews, N.B., and built and equipped with Canadian materials.

Contrary to the inference in your article, under our brands the customer may secure a package that is not boiled or steamed, but carefully fried according to the best French methods, packed in the purest grade of olive oil, and the finished product is offered to the customer, not in an unattractive container, but in hand-cleaned cans wrapped in oil-proof parchment paper, and the whole surmounted by a most attractive label.

Despite these war times when the Canadian consumer is unable to procure the imported article there is no reason for any Canadians to deprive themselves of the delicacy of a strictly fancy sardine; and for your information, our brands are securing prices on a parity with any first-class imported article, except that the customer saves the duty when he buys the home product.

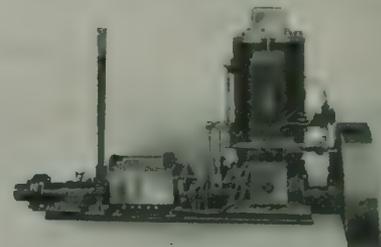
We are gratified to say that each tin is stamped with the word "Canada," as we are proud to demonstrate to the Canadian public that the article can be and is produced as well at home as in any other foreign producing centre.

I would be very much pleased to hear from you, and trust that you will see your way clear to correct any erroneous impression which may have been left in the minds of your readers by the article in your August issue.

Yours very truly,

Booth Fisheries Co., of Canada, Ltd.,
H. B. GRADY, General Superintendent.

"JACOBSON" OIL ENGINE Special Fisherman's Engine 5 to 200 H.P.



Use Crude or Fuel Oil

Investigate the "Jacobson" Engine if you want reliable power with the lowest fuel expense and freedom from troubles. It gives the economy of the full Diesel type with simplicity and lowered first cost of the Semi-Diesel.

Hot Head Ignition. The simplicity of the cylinder head gives better scavenging than hot bulb ignition and prevents carbon. No spark plugs, wiring or batteries.

Fuel Injection Pumps. Special design of spray nozzle makes clogging impossible. No carbureter.

Sizes 5 to 600 H.P.

JACOBSON GAS ENGINE CO.
SARATOGA SPRINGS, N.Y., U.S.A.



For All We Have and Are---

To-night—under the wide canopy of Heaven, trenched in a line from the North Sea of Switzerland, pacing decks of ships, peering into darkness, that holds perils such as God's omnipotence never formed, millions of men are braving death for us.

Not one among whom but holds some woman dear (even though she be only the Dream Woman of his finer moments).

And with thoughts of "her" comes that other thought of the German Michael loosed upon the earth.

Do you wonder why our men fight hard?

Think, then, of what a privilege it is for us women to help send sufficient of the right kinds of food for the bodies of such great souls.

Think of this and then ask yourself whether you will forbear to substitute other foods for the white bread, beef and bacon you and your family now consume; and, in addition, prevent the waste of a single ounce of food in your home.

Your service of sacrifice is so small. The result will be so great—you surely cannot refuse.

Serve Our Heroes---Sign and Live Up to Your Food Service Pledge

Women's Auxiliary, Organization of Resources Committee, in Cooperation with The Hon. W. J. Hanna, Food Controller.

The Dominion Fisheries Commission Vancouver



THE Dominion Fisheries Commission has spent two months in British Columbia gathering evidence of conditions and has departed for Ottawa to digest the facts and make findings.

The whole case from every angle has been fully presented, and it is remarkable that no one is saying that he did not have a chance to register his complaint. This is due to the tactful patience of Chairman Evans who prolonged the sessions of the commission so that all who desired to be heard might have their say.

No commissioners in the memory of British Columbia worked harder, endured more and travelled farther in less time than the members of this commission. They took their comfort in their hands when they went north to visit the canneries in one of the fisheries patrol boats. They were shut off from organized civilization and all the comforts of home for weeks at a time. They were buffeted with the seas and burnt brown by the clearest sun in all Canada while being frequently stung by the stingiest mosquitoes of the species, all with good cheer in the performance of their duty. And after it all, they reappeared again in Vancouver, pictures of fitness and still going strong as optimists, with never a spot taken off their sense of humor.

It was an admirable commission, particularly as to its personnel, though in the opinion of all interested in the fisheries its scope was too limited. W. Sanford Evans made an ideal head of the commission, from the start insuring the approving confidence of the public by clearly enunciating the purpose of the commission and inviting evidence from all and sundry. Early in

the investigation he made it plain that it was evidence and not argument that was desired, and he thus shut off the interminable pleadings of counsel who were ready to air their eloquence. Firsthand evidence was welcomed at all times, but third party protestations were frowned upon. Such a course was highly popular.

While the deepsea fisheries did not come within the purview of the commission, yet evidence was taken regarding them as it is hardly possible to get a northern B. C. fisherman to talk fishing without hearing facts relative to halibut and cod fishing. In this line of inquiry, commissioner Fred T. James rendered invaluable service as he is an authority on the distribution of sea fishes, being interested both on the Atlantic and the Pacific. The astounding fact was adduced that as much edible fish is destroyed in B. C. as is brought to port. The fish destroyed are black cod or sable fish, red cod, ling cod and grey cod. As 20,000,000 lbs. of deepsea fish are marketed yearly in B. C., it follows that a like quantity is destroyed. The commissioners were gravely interested in the problem presented and promised to do all they could to create a market for the fish now destroyed. The high price of halibut, reaching at time to 22 cents a pound, as compared with black cod at 2½ cents a pound, is the reason that halibut is brought to port and black cod caught on the halibut lines is thrown overboard.

W. A. Found, Superintendent of Fisheries, whose presence with the commission throughout its tour was of great help, is greatly exercised by this waste of food fishes, and it is expected that immediate action to

Service and Satisfaction



Is what you give your customers when you equip your store with



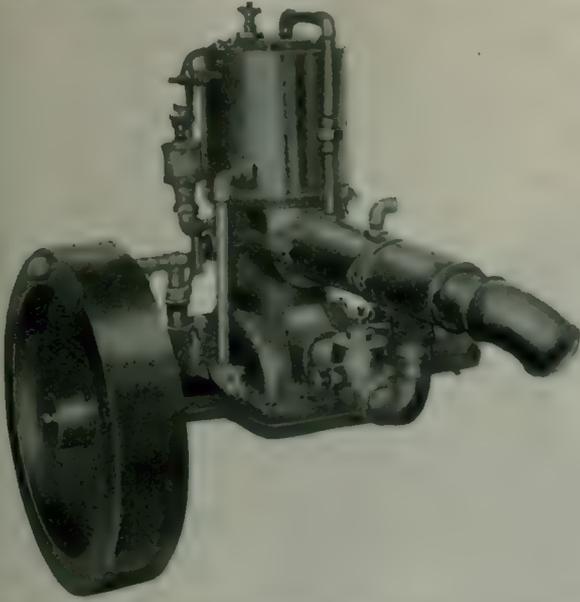
FISH CASES

With the daily increase in fish consumption your sales will increase if you install a proper method of handling and display.

We manufacture different varieties of fish cases. Write for our illustrated folder.

JOHN HILLOCK & CO., 154 George St., TORONTO

An Exceptional Opportunity for Fishermen



A few new 6 to 7 h.p. slow speed Marine Engines, made by the Canada Gas Power Launions, suitable for small fishing boats. These are the last remaining of a Bankrupt Stock, and are offered at low prices for quick turnover. Large stock of repair parts always available.

Don't miss this opportunity to secure a high grade engine at a Bargain Price.

Write Marine Sales Dept. to-day.

The A. R. Williams Machinery Co., Limited
TORONTO - CANADA

Columbian
ROW BOAT MOTOR

Saves Time and Labor

FOR five years the Columbian Row-Boat Motor has been giving SATISFACTION to thousands of fishermen, whose engines must be RELIABLE, STURDY, SIMPLE and ECONOMICAL. Although this motor contains every modern improvement, we are still selling it at **\$60** (\$10 extra for high tension waterproof magneto built in fly-wheel).



With the aid of this highly efficient motor, Fishermen not only save themselves much heavy toil, but are able to go farther in less time, and so increase their fares to a large extent.

We can supply complete equipments of two and four cycle marine engines up to 300 H.P.

Tell us your needs to-day, and we will be pleased to send you a catalogue. Address:—

CULLEN MOTOR COMPANY
112 W. Lake St., CHICAGO, ILL.

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remedy this condition will be effected either through the Department of Marine and Fisheries or through the agency when created by the food controller, the Hon. W. J. Hanna.

H. B. Thomson, British Columbia's representative on the commission, besides bringing one of the keenest business brains on the coast to bear upon the evidence submitted, acted also as guide to the commission for he knows British Columbia like a book in all its conditions. As with all such commission's evidence was given at times with restraint. It required a man like H. B. Thomson, fully acclimatized and knowing the B. C. spirit to fathom what was merely indicated by the witnesses. When the findings of the commissioners come to be written, the shrewd judgment and thorough understanding of Mr. Thomson will be made evident.



SO FAR as Vancouver was concerned the commission dealt with the question of the advisability of permitting the export of raw salmon other than Sockeye for canning purposes. This matter affects the Fraser River and the west coast of Vancouver Island. The fishermen in the Fraser testified that if a fair price were given for pinks and chums they would prefer to sell to the Canadian canners rather than to the United States; but they feared that if United States competition were barred that the price the Canadian canners would pay would not adequately recompense the fishermen. They admitted, however, that the price paid by the fresh fish companies approximated to the price paid by the U. S. buyers. The canners on their part said they were prepared to buy all the pinks and chums the fishermen could catch and considered that in the interest of the maintenance of the canning industry they should be given a preference over the U. S. canners, whose peculiar environment enabled them to offer higher prices for B. C. cheaper salmon than they carried. The canners declared they were prepared to pay a just price for pinks and chums, and would agree to can all the fish caught. The difficulty is over the definition of a "fair price."

On September 6 the canners were paying 20 cents a piece for pinks and 25 cents apiece for chums on the Fraser River, and the fishermen were catching 150 pinks to the boat, which produced \$30 a boat. At these prices with the fish running as they are the fishermen are satisfied and this satisfaction is not yet disturbed by the presence of United States buyers in Canadian waters who may offer slightly higher prices, because the run of pinks on Puget Sound is giving the U. S. canners all the fish they can handle. But when the U. S. buyers come to Canadian waters, after the Puget Sound run falls off, the fishermen may prefer to sell to them than to the Canadian canners. So a fair price so far as the fishermen are concerned is a shifting price and really dissolves itself into the best price that can be got through U. S. competition.

The situation calls for a price fixer. There is a price for pinks and chums that would be fair to the fishermen, the canners and the canning public. That price should be ascertained and fixed by government authority, if it is desired that a long established industry should be protected against unusual and unfair competition from U. S. industries. That appears simple but there is ever present a clash of public interest and public opinion when matters touching the fisheries of the Fraser River are discussed, for these fisheries are viewed in B. C. very much as the Intercolonial Rail-

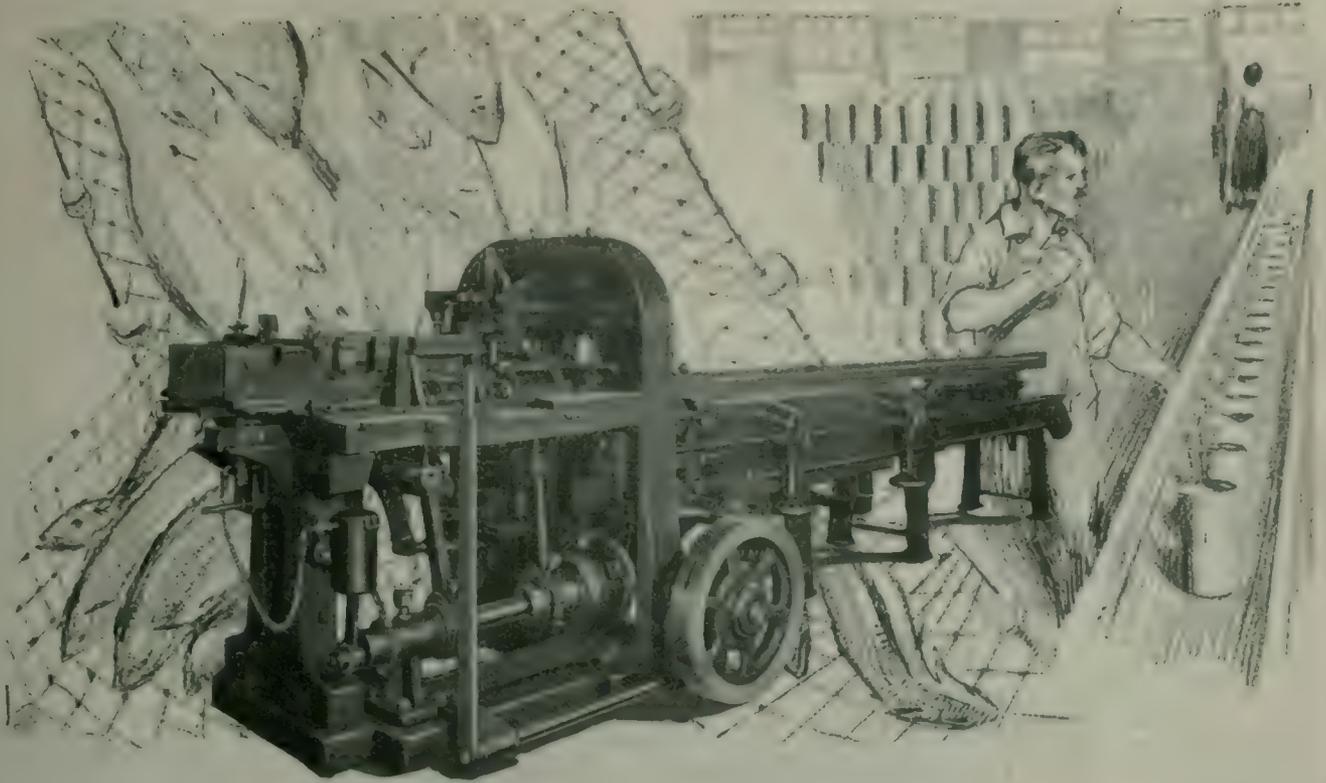
way is viewed in the Maritime Provinces; they are looked upon as the property of the people of B. C., whereas as a matter of fact, they are the property of all the people of Canada. Holding the larger view one may regulate prices in the interest of all Canadians; but holding the narrower view, one must deal with the question from the local aspect of it. In war time it may be desirable to see that all the people of Canada pay only a fair price for foodstuffs.

The fisheries problems in British Columbia are a tangled net. There are no hopes that the commissioners may find a speedy and successful course out of all their difficulties.

HALIBUT ARRIVALS AT PACIFIC COAST PORTS FOR THE MONTH OF JULY, 1917.

At Prince Rupert, B.C.:

- July 1. Corona, U. S., 12,000, Booth Fisheries Company.
- July 1. Stranger, U. S., 15,000, Booth Fisheries Company.
- July 1. Yakutat, U. S., 50,000, Booth Fisheries Company.
- July 1. Tahoma, U.S., 24,000, Atlin Fisheries, Limited.
- July 1. Soya, 5,000, Atlin Fisheries, Limited.
- July 1. Margalice, 9,000, Atlin Fisheries, Limited.
- July 1. Nornen, 15,000, Atlin Fisheries, Limited.
- July 1. Haysport 1, 25,000, Atlin Fisheries, Limited.
- July 2. Andrew Kelly, 120,000, The C. F. & C. S. Co., Ltd.
- July 2. James Carruthers, 25,000, The C. F. & C. S. Co., Ltd.
- July 2. Viking, U. S., 10,000, The C. F. & C. S. Co., Ltd.
- July 2. Onahl, U. S., 18,000, The C. F. & C. S. Co., Ltd.
- July 2. Nellie, U. S., 5,000, The C. F. & C. S. Co., Ltd.
- July 2, Core, U. S., 5,000, The C. F. & C. S. Co., Ltd.
- July 2. D. C. F. 1, 9,000 Atlin Fisheries, Limited.
- July 2, Aurora, U. S., 9,000, Royal Fish Co.
- July 2, Director, U. S., 14,000, Royal Fish Co.
- July 3, Starr, U. S., 15,000, Pacific Fisheries Company.
- July 3, Kitwinmar, 7,000, Pacific Fisheries Company.
- July 3, Roald Amunsden, U. S., 30,000, Booth Fisheries Company.
- July 3. Alten, U. S., 60,000, The C. F. & C. S. Co., Ltd.
- July 4, Chief Skugaid, 50,000, The C. F. & C. S. Co., Ltd.
- July 4, La Paloma, U. S., 22,000, The C. F. & C. S. Co., Ltd.
- July 5, Elfin, U. S., 8,000, The C. F. & C. S. Co., Ltd.
- July 5, G. Theckla, U. S., 5,000, The C. F. & C. S. Co., Ltd.
- July 6, Chief Zibassa, 18,000, The C. F. & C. S. Co., Ltd.
- July 6, Rose Spit, 7,000, The C. F. & C. S. Co., Ltd.
- July 8, Royal F, 6,000, Atlin Fisheries, Limited.
- July 8, Joe Baker, 9,000, The C. F. & C. S. Co., Ltd.
- July 9, Agnes B, 5,000, The C. F. & C. S. Co., Ltd.
- July 9, Mayflower, U. S., 9,000, The C. F. & C. S. Co., Ltd.
- July 10, North Cape, U. S., 10,000, Royal Fish Company.
- July 10, Selma, U. S., 11,000, Royal Fish Company.
- July 10, Hecate, 6,000, The C. F. & C. S. Co., Ltd.
- July 10, Mayflower, 10,000, The C. F. & C. S. Co., Ltd.



“CANS!---MORE CANS!”

When the run of fish is good that is the cry. If the pack is to be successful and profitable the machines that meet emergencies must be dependable.

The supply of cans must meet the incoming rush of fish smoothly — always ahead, no stoppage for repairs, no failure on the part of any of them to perform its share.

“Bliss” Automatic Can-Making Machinery is used in every part of the world where cans are required—is the development of nearly sixty years—can be depended upon.

“BLISS” AUTOMATIC LOCK-AND-LAP SEAM BODY-MAKER No. 22-N is the machine illustrated above. Shown with automatic suction blank feed and roll solder attachment. Production speed upwards of 150 per minute.

Write for Catalogue Section No. 18-A



1857

E. W. BLISS COMPANY

Main Office and Works; BROOKLYN, N.Y., U.S.A.

CHICAGO OFFICE
Peopl.'s Gas Bldg.

DETROIT OFFICE
Dime Bank Bldg.

CLEVELAND OFFICE
Union Bank Bldg.



1917

LONDON, S.E., ENGLAND, Pockock Street, Blackfriars Road PARIS, FRANCE, 100 Boulevard Victor-Hugo St. Ouen

- July 10, Nautilus, 11,000, Atlin Fisheries, Limited.
 July 11, Nornen, 8,000, The C. F. & C. S. Co., Ltd.
 July 11, Soya, 8,000, The C. F. & C. S. Co., Ltd.
 July 11, Gilford, 8,000, The C. F. & C. S. Co., Ltd.
 July 12, Polaris, U. S., 18,000, The C. F. & C. S. Co., Ltd.
 July 12, Dip, U. S., 6,000, The C. F. & C. S. Co., Ltd.
 July 12, Dolphin, U. S., 5,000, The C. F. & C. S. Co., Ltd.
 July 12, Saturn, U. S., 8,000, The C. F. & C. S. Co., Ltd.
 July 12, Maud, 8,000, The C. F. & C. S. Co., Ltd.
 July 12, Corona, U. S., 22,000, Booth Fisheries Company.
 July 12, Lincoln, U. S., 8,000, Booth Fisheries Co.
 July 13, Haysport 2, 24,000, The C. F. & C. S. Co., Ltd.
 July 13, Lillian M., 6,000, Atlin Fisheries Company.
 July 13, Geo. E. Foster, 38,000, The C. F. & C. S. Co., Ltd.
 July 14, Doreen, 8,000, The C. F. & C. S. Co., Ltd.
 July 14, Onah, U. S., 12,000, The C. F. & C. S. Co., Ltd.
 July 14, Klatawa, 5,000, The C. F. & C. S. Co., Ltd.
 July 15, Venus, U. S., 5,000, Royal Fish Company.
 July 15, Flora Bel, 7,000, Royal Fish Company.
 July 15, Margalice, 5,000, Royal Fish Company.
 July 15, Clara, 8,000, Royal Fish Company.
 July 15, James Carruthers, 10,000, The C. F. & C. S. Ltd.
 July 16, Tordenskjold, U. S., 65,000, Booth Fisheries Company.
 July 16, Malola, U. S., 35,000, The C. F. & C. S. Co., Ltd.
 July 16, Fisher, U. S., 5,000, The C. F. & C. S. Co., Ltd.
 July 16, Unimak, U. S., 13,000, The C. F. & C. S. Co., Ltd.
 July 16, Todd, U. S., 19,000, The C. F. & C. S. Co., Ltd.
 July 16, N. & S., 12,000, The C. F. & C. S. Co., Ltd.
 July 16, Rennell, 5,000, The C. F. & C. S. Co., Ltd.
 July 16, Ila, 5,000, The C. F. & C. S. Co., Ltd.
 July 16, Chief Skugaid, 25,000, The C. F. & C. S. Co., Ltd.
 July 17, Liberty, U. S., 40,000, The C. F. & C. S. Co., Ltd.
 July 17, Nellie, U. S., 12,000, The C. F. & C. S. Co., Ltd.
 July 17, Starr, U. S., 15,000, The C. F. & C. S. Co., Ltd.
 July 17, Director, U. S., 6,000, The C. F. & C. S. Co., Ltd.
 July 17, Margaret, U. S., 5,000, The C. F. & C. S. Co., Ltd.
 July 17, Ringleader, 5,000, The C. F. & C. S. Co., Ltd.
 July 17, Kodiak, U. S., 50,000, The C. F. & C. S. Co., Ltd.
 July 18, Sitka, U. S., 30,000, The C. F. & C. S. Co., Ltd.
 July 18, Grier Starrett, 10,000, The C. F. & C. S. Co., Ltd.
 July 18, Cora, U. S., 10,000, The C. F. & C. S. Co., Ltd.
 July 18, Viking, 7,000, The C. F. & C. S. Co., Ltd.
 July 19, Elfin, U. S., 10,000, The C. F. & C. S. Co., Ltd.
 July 19, Aurora, U. S., 8,000, The C. F. & C. S. Co., Ltd.
 July 19, Mars, U. S., 20,000, The C. F. & C. S. Co., Ltd.
 July 19, Stranger, U. S., 11,000, The C. F. & C. S. Co., Ltd.
 July 19, Seattle, U. S., 30,000, The C. F. & C. S. Co., Ltd.
 July 19, E. Neilson, U. S., 11,000, The C. F. & C. S. Co., Ltd.
 July 19, Viking, U. S., 7,000, The C. F. & C. S. Co., Ltd.
 July 19, North Cape, U. S., 9,000, The C. F. & C. S. Co., Ltd.
 July 19, Nornen, 16,000, The C. F. & C. S. Co., Ltd.
 July 19, Joe Baker, 14,000, The C. F. & C. S. Co., Ltd.
 July 19, Agnes B., 10,000, The C. F. & C. S. Co., Ltd.
 July 20, Andrew Kelly, 60,000, The C. F. & C. S. Co., Ltd.
 July 22, Chief Zibassa, 8,000, The C. F. & C. S. Co., Ltd.
 July 22, James Carruthers, 15,000, The C. F. & C. S. Co., Ltd.
 July 22, Dolphin, 14,000, The C. F. & C. S. Co., Ltd.
 July 22, Magnhel, U. S., 9,000, The C. F. & C. S. Co., Ltd.
 July 22, Yakutat, U. S., 20,000, The C. F. & C. S. Co., Ltd.
 July 22, Teddy J., U. S., 5,000, The C. F. & C. S. Co., Ltd.
 July 22, Lumen, U. S., 12,000, Royal Fish Company.
 July 22, Alvilda, U. S., 8,000, Royal Fish Company.
 July 22, Convention, U. S., 5,000, Royal Fish Co.
 July 22, La Balmma, U. S., 45,000, Booth Fisheries Company.
 July 22, Haysport, 20,000, Atlin Fisheries, Limited.
 July 22, Mayflower, 9,000, Atlin Fisheries, Ltd.
 July 22, Kubien, 3,000, Atlin Fisheries, Limited.
 July 22, Nautilus, 5,000, Atlin Fisheries, Limited.
 July 23, Corona, U. S., 12,000, Atlin Fisheries, Limited.
 July 23, Liberty, U. S., 6,000, Atlin Fisheries, Limited.
 July 24, Lancing, U. S., 7,000, Atlin Fisheries, Ltd.
 July 24, G. Techkla, U. S., 7,000, Atlin Fisheries, Limited.
 July 24, Bringold, U. S., 8,000, Atlin Fisheries, Ltd.
 July 24, Rosespit, 17,000, Atlin Fisheries, Limited.
 July 24, Alten, U. S., 50,000, Booth Fisheries Co.
 July 24, H. & R., U. S., 5,000, Atlin Fisheries, Ltd.
 July 24, Kitwinmar, 17,000, Atlin Fisheries, Limited.
 July 26, Mayflower, U. S., 8,000, Booth Fisheries Company.
 July 26, Lenor, U. S., 12,000, Booth Fisheries Co.
 July 26, Lincoln, U. S., 7,000, Booth Fisheries Co.
 July 26, Selma, U. S., 6,000, Booth Fisheries Co.
 July 26, Roald Amunsden, U. S., 13,000, The C. F. & C. S. Co., Ltd.
 July 27, Albatross, U. S., 25,000, The C. F. & C. S. Co., Ltd.
 July 27, Tom & Al., U. S., 28,000, The C. F. & C. S. Co., Ltd.
 July 27, Sumner, U. S., 40,000, The C. F. & C. S. Co., Ltd.
 July 27, Clara N., 11,000, The C. F. & C. S. Co., Ltd.
 July 27, Lillian M., 11,000, The C. F. & C. S. Co., Ltd.
 July 27, P. Doreen, 11,000, The C. F. & C. S. Co., Ltd.
 July 28, Polaris, U. S., 55,000, Pacific Fisheries Co.
 July 28, Margalice, 5,000, Atlin Fisheries, Limited.
 July 28, Haysport 2, 35,000, Atlin Fisheries, Limited.

W. R. SPOONER

Wholesale and Commission Dealer

Fish of all Kinds

119 Youville Square, - MONTREAL

I am in the market at all times to Buy or Sell on Commission,
Fresh, Frozen, Smoked and Salt Sea and Lake Fish, in Carload
Lots or Less.

Correspondence Solicited

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BONELESS COD FISH

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SEA FISH

A. W. Fader. Canso, N.S.

Harbor Breton Fish Co.,
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Harbor Breton, Nfld.

National Fish Co., Ltd.

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National Fish Company, Limited

Halifax and Port Hawkesbury - N. S.

“National Brand”

*Haddies, Fillets, Kippers, Bloaters, Scotch
Cured Herring.*

Producers

Fresh, Frozen and Salt Sea Fish

July 28, Soya, 7,000, Atlin Fisheries, Limited.
 July 28, N. & S., 7,000, Atlin Fisheries, Limited.
 July 29, Tahoma, U. S., 20,000, Booth Fisheries Co.
 July 29, Margaret, U. S., 5,000, Booth Fisheries Co.
 July 29, Fisher, U. S., 17,000, Royal Fish Company.
 July 29, Director, U. S., 9,000, Royal Fish Company.
 July 29, Venus, U. S., 10,000, The C. F. & C. S. Co., Ltd.
 July 29, Gilford, 8,000, The C. F. & C. S. Co., Ltd.
 July 29, Nautilus, 8,000, The C. F. & C. S. Co., Ltd.
 July 30, James Carruthers, 20,000, The C. F. & C. S. Co., Ltd.
 July 30, Kodiak U. S., 40,000, Atlin Fisheries, Ltd.
 July 30, Malolo, U. S., 50,000, Booth Fisheries Co.
 July 30, Seymour, U. S., 40,000, The C. F. & C. S. Co., Ltd.
 July 31, Chief Skugaid, 25,000, The C. F. & C. S. Co., Ltd.
 July 31, Tordenskjold, U. S., 35,000, Pacific Fisheries Co.
 July 31, Magnhell, U. S., 7,000, The C. F. & C. S. Co., Ltd.
 July 31, Nellie, U. S., 7,000, The C. F. & C. S. Co., Ltd.
 July 31, Caygeon, 10,000, The C. F. & C. S. Co., Ltd.
 July 31, May Flower, 8,000, The C. F. & C. S. Co., Ltd.
 July 31, D. C. F. 1, 18,000, The C. F. & C. S. Co., Ltd.
 July 31, King George, 8,000, The C. F. & C. S. Co., Ltd.
 July 31, Elfin, U. S., 9,000, Booth Fisheries Co.
 July 31, Todd, U. S., 15,000, Booth Fisheries Co.
 July 31, Ringleader, 5,000, Atlin Fisheries, Limited.
 Note.—All vessels not specified "U. S." are of Canadian registry.

At Vancouver, B.C.:

July 2, Madeline Dyke, 10,000, Western Packers, Limited.
 July 2, Flamingo, 80,000, The Canadian Fishing Co., Ltd.
 July 2, Canada, 40,000, The Canadian Fishing Co., Limited.
 July 3, Pescawha, 50,000, The Canadian Fishing Co., Limited.
 July 10, Celestial Empire, 25,000, The Canadian Fishing Co., Ltd.
 July 10, Iskum, 10,000, Western Packers, Ltd.
 July 12, Kingsway, 70,000, The Canadian Fishing Co., Limited.
 July 13, Emma H., 50,000, The Canadian Fishing Co., Limited.
 July 16, Madeline Dyke, 10,000, The Canadian Fishing Co., Limited.
 July 29, Pescawha, 40,000, The Canadian Fishing Co., Limited.
 July 19, Manhattan, 150,000, New England Fish Co.
 July 20, Flamingo, 80,000, The Canadian Fishing Co., Limited.
 July 21, Canada 60,000, The Canadian Fishing Co., Limited.
 July 21, Borealis, 30,000, The Canadian Fishing Co., Limited.
 July 23, Celestial Empire, 85,000, The Canadian Fishing Co., Limited.
 July 28, Kingsway, 70,000, The Canadian Fishing Co., Limited.
 July 30, Iskum, 25,000, The Canadian Fishing Co., Limited.

At Ketchikan, Alaska:

July 1, Manhattan, 150,000, New England Fish Co.
 July 1, Prospector, 30,000, New England Fish Co.
 July 2 Tyee, 50,000, New England Fish Co.
 July 9, New England, 150,000, New England Fish Company.
 July 16, Knickerbocker, 80,000, New England Fish Company.
 July 19, Pioneer, 50,000, New England Fish Co.
 July 19, Violet, 10,000, New England Fish Co.
 July 23, Tyee, 80,000, New England Fish Co.

GLOUCESTER BOARD OF TRADE STATISTICAL BULLETIN NO. 7.—July, 1917.

	1917.	1916.	1915.
	Pounds.	Pounds.	Pounds.
Fresh Cod	4,031,070	1,887,872	1,521,841
Salt Cod	1,202,665	1,768,418	2,857,957
Halibut	136,620	174,817	258,287
Fresh Haddock	502,135	368,262	1,136,750
Salt Haddock	45,435	12,127	41,980
Fresh Hake	87,623	288,448	541,680
Salt Hake	5,350	42,851	18,535
Salt Cusk	2,010	8,933	10,930
Fresh Cusk	170,178	338,526	259,417
Fresh Pollock	62,375	173,976	31,610
Salt Pollock	8,650	28,082	69,545
Flitches	11,836	7,424	19,831
Not Products of			
Am. Fisheries	4,065,186	2,415,293	2,263,460
	10,331,133	7,515,029	9,031,823
Fresh Mackerel, bbls.	219	1,329	145
Salt Mackerel, bbls.	1,520	6,492	1,504
Fresh Herring, bbls.	121	15	....
Salt Herring, bbls.	952	1,764	2,949
Cured Fish, qtls.	4,058	6,522	7,129
Miscellaneous: Mackerel, foreign 294 bbls.; Gray-fish, 306,072 lbs.; Whiting, 2,000 bbls.; Small Pollock, 166 bbls.			

TOTAL CATCH—GLOUCESTER.

	January 1st to August 1st, 1917.		
	1917.	1916.	1915.
	Pounds.	Pounds.	Pounds.
Salt Cod	2,811,152	4,718,027	6,452,752
Fresh Cod	11,575,110	9,952,988	8,900,775
Halibut	600,178	1,188,780	1,811,377
Haddock	2,106,739	3,809,180	4,735,213
Hake	230,047	984,743	2,161,115
Cusk	326,464	943,074	1,512,691
Pollock	3,345,815	2,746,587	1,946,360
Flitches	33,032	44,227	124,155
Not Product of			
Am. Fisheries	7,879,801	4,383,499	4,331,278
	28,908,338	28,771,055	31,975,716
Fresh Herring, lbs.	31,789	1,587,100	1,543,080
(bbls.)			
Salt Herring, bbls.	36,192	27,237	17,399
Frozen Herring, lbs.	487,946	2,816,680	2,470,352
Fresh Mackerel, bbls.	728	1,751	1,023
Salt Mackerel, bbls.	6,888	9,692	5,176
Cured Fish, qtls.	11,039	11,528	7,058
Total—1917: 48,133,170 lbs.; 1916: 43,246,417 lbs.			



Smoke

TUCKETTS T. & B.

The best Virginia leaf, mellowed and blended by experts. Will give you pipe satisfaction.

T. & B. Plug is sold in three sizes, 10c, 25c and 30c per plug. Has been smoked for 60 years by Canadians who prefer the best.

If you like a high grade tobacco, cut ready for the pipe, smoke Tucketts T. & B. Myrtle Cut. Sold in pocket packages 10c, 1/2 lb. tins 60c, full lb. tins \$1.20

THE TUCKETT TOBACCO CO., Limited, Hamilton, Ontario

DIGBY FISHING NEWS.

The Maritime Fish Corporation are very busy now working to their fullest capacity, and could readily find employment for more hands to deal with the fish on shore. They are shipping a large quantity in ice for western markets, and three or four teams are constantly employed conveying shipments to the wharf, for transmission across the Bay.

The catches are falling off somewhat lately and some of the vessels have brought in only small fares.

The Nova Scotia Fish Co. is doing nothing recently, but E. Robertson has a few boatmen fishing for him.

Schooner Souvenir has landed two fine cargoes of salt hake from the New Brunswick shore, and schooner Cora Gertie from Freeport two loads of salt pollock and hake.

J. E. Snow is as usual busy, and the Loren B. Snow after discharging her load is fitting up for haddock fishing again. The Sila G. Boutilier landed another cargo this week.

David Sproule & Co. are chiefly supplied by the local fishing boats, and H. H. Syda purchased the fare of the schr. Roseway recently landed.

Captain Harry Ross, in his schr. Morning Star, made a very successful trip recently and landed \$4,600 worth at Gloucester, each member of the crew getting \$113 clear.

CONSUMERS CORDAGE CO., LTD.

The cut (which was not to hand for last month's notice) shows the "Accommodation" being hauled up the St. Lawrence River using rope made by their company.

SALT FOR CANADIAN FISHERIES FROM TURKS AND CAICOS ISLANDS.

Apropos of the shortage of salt for the use of the Canadian fisheries, it may be important to note that a representative of the Turks and Caicos Islands, British West Indies, proposes to visit Newfoundland and Canada during the present autumn with the object of establishing, if possible, a trade in salt between these countries and the islands mentioned, in which salt is the chief product.

It is said to be possible to guarantee a yearly output of 75,000 tons of good quality. The Commissioner of these islands has lately supplied two cargoes of salt to dealers in Newfoundland.

The address of the Commissioner is: George Whitefield Smith, Grand Trunk, Turks and Caicos Islands, B.W.I.—Weekly Bulletin.

NOTES.

On the Atlantic coast weather conditions were variable during August. Codfish generally were abundant on the fishing grounds, but bait was somewhat scarce in some sections, while dogfish in many places caused trouble and loss.

The cod and haddock fishery in Nova Scotia for August was greater than for August last year; the increase being 55,363 cwts.

Eastward of Queens County herring were less abundant than last year, but westward of that county the quantity taken was considerably greater, except in Digby county where the catch was very much less.

Compared with August last year the quantity of herring taken for smoking purposes in Charlotte County, New Brunswick, was very much short. On the other hand the quantity of sardines taken was considerably greater with prices nearly back to normal.

The codfishing fleet of Caraquet and Shippegan, New Brunswick, had better fishing results during August which greatly lessened the difference between the total landings this season and last.

About the same quantity of cod and haddock was landed in Prince Edward Island, but hake was nearly 2000 cwts. short.

Cod and mackerel were not plentiful at the Magdalen Islands.

Lobster fishing is being continued till September 10th on that part of the Coast from Antigonish County northward along the southern part of the Gulf of St. Lawrence to Gaspé including Prince Edward Island.

Since the opening of the season on November 15th until the end of August there were packed 170,073 cases while 70,124 cwts. were shipped in shell.

From the opening of the season until the end (August 11th) in the preceding year there were 188,545 cases packed and 94,409 cwts. used fresh or shipped in shell.

In view of the fact that this is the big run year on the Fraser River, British Columbia, sockeye fishing has been disappointing so far. The catch in the southern or Fraser River district for August this year amounts to only 74,685 cwts., whereas for August 1913 the last "big run" year the catch was 388,181 cwts.

The sockeye run in Rivers Inlet was good, but the fish were small and gill-netting was less successful than usual.

In the Prince Rupert district humpback salmon were plentiful during the month. These fish were also fairly abundant in the Vancouver Island district.

One Prince Edward Island fisherman and two British Columbia fishermen were drowned during August.

INVENTS FISHING MACHINE.

N. A. Lybeck of 309 Broadway says he has constructed a fishing machine that will prove a great benefit to the public in keeping up an ample supply of sea food at moderate cost.

The invention is capable of removing, Mr. Lybeck says, all the fish from 92,000,000 square feet of water per minute by a combination of his new fishbone netting, searchlight, scoop, conveyor and speeder. Allowing 1,000 pounds of fish to every 92,000,000 square feet of water, the inventor asserts that he will catch 30 tons an hour or 300 tons of fish in a ten-hour night's work by steady running.—Eastport Sentinel.

THE *P. A. Bousley*
CANADIAN
FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV

MONTREAL, OCTOBER, 1917

No. 10

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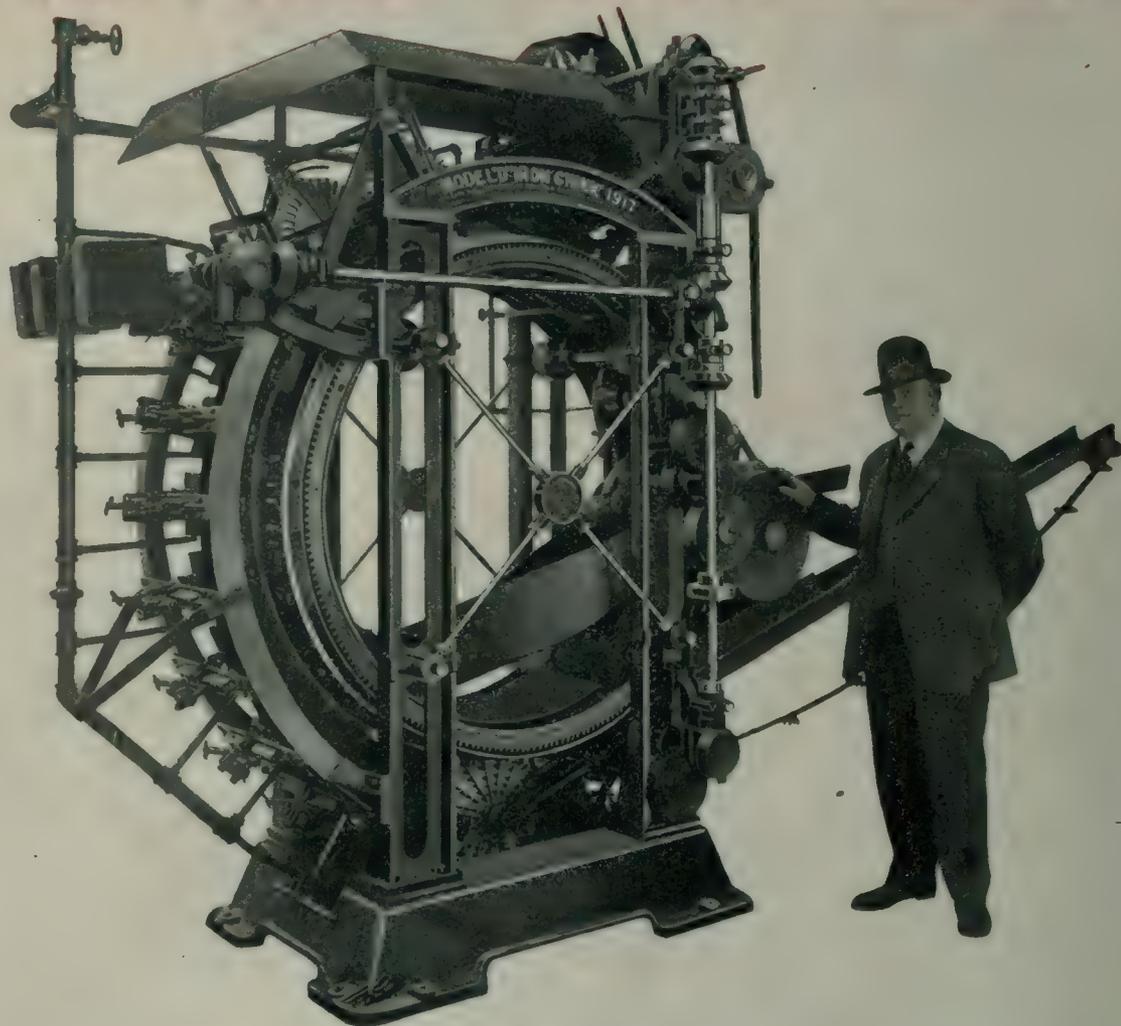
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A COMBINED BUTCHERING, CLEANING AND SLIMING MACHINE. THE ONLY MACHINE OF ITS KIND ON THE MARKET.

For the past fifteen years we have been manufacturing Butchering and Cleaning Machines for use in the salmon industry.

These machines have proven themselves great labor and fish savers and a packing plant is not considered complete without one.

The above illustration shows our latest improved model—one that is far superior to any we have heretofore manufactured.

We are now taking orders for 1918 delivery. Full information, prices, terms, etc., furnished on application.

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OF CANADA AND NEWFOUNDLAND
THE SCIENCE OF THE FISH CULTURE
AND THE USE AND VALUE
OF FISH PRODUCTS

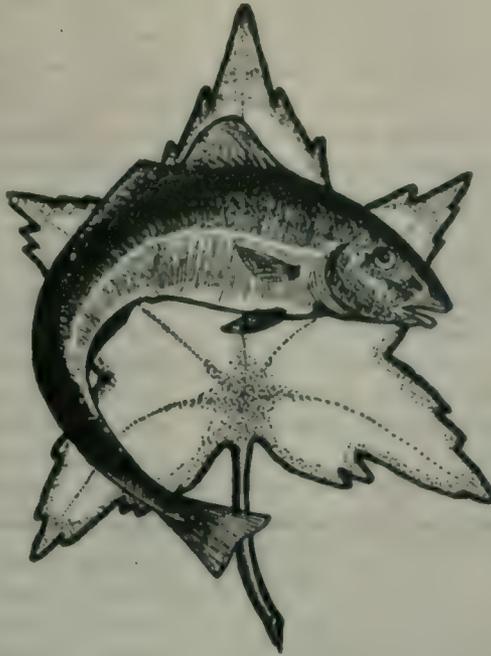
F. WILLIAM WALLACE
EDITOR

The Industrial & Educational
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Published on the 24th day of each month. Changes of advertisement should be in the publisher's hands ten days before that date. Cuts should be sent by mail, not by express. Readers are cordially invited to send to the Editor items of Fishery news, also articles on subjects of practical interest. If suitable for publication these will be paid for at our regular rate.

Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, OCTOBER, 1917

No. 10

We regret the delay in getting this issue into the mails. The printing plants at Montreal have been somewhat inconvenienced by a strike of their pressmen and assistants, declared about the middle of October and not yet settled. This issue is therefore some two weeks late. But we have brought it up to date by destroying some of the type that had been already set and by the inclusion of an extra eight pages.

PROGRESS AND MORE PROGRESS.

The success attained by the propaganda of the Canadian Fisheries Association, waged since the inauguration of that institution three years ago but with special vigour and determination during the last eight months, notwithstanding the reactionary policy of the late Minister of Naval Service, is most encouraging and will undoubtedly actuate greater efforts.

Eight months ago a special effort was inaugurated to interest the Canadian people in the fish resources of their country, and the food products thereof. Since then every member of the C.F.A. has been shouting FISH and doing his utmost to interest every person, firm and corporation about him in this commodity. Special efforts were made to increase the membership of the Canadian Fisheries Association, and each new recruit was given the slogan,

Immediately on the appointment of any governmental committee to consider resources or encourage economy or increased production of foodsuffs, a deputation from the C.F.A. or one of its branches waited upon it, and urged the great possibilities of fish as a food. All the principal fishing ports were visited by one or more members of the C.F.A. Executive, who urged greater efforts in the direction of production and more care in the preparation of the products for the market.

Not the least item of this campaign has been the six special issues of the Canadian Fisherman, prepared and published at great expense and sent into tens of thousands of offices and homes of Canadians, many of whom had never before given a thought to their country's resources of fish or the nutritive and economic values of this article as a food.

But much remains yet to be done, and now is the opportune time to do it. When the present period of the industrial history of Canada comes to be written and the author places the responsibility for the criminal delay there has been in the development of Canada's fish resources, it undoubtedly will be found entered up against the governmental departments, both Federal and Provincial, that have had in charge the administration of our fisheries. In the same pages we will find that the first to appreciate the value of

these resources were the late Minister of Militia, Sir Sam Hughes, who must be credited with the export of Canadian fish for the soldiers at the front, and the Food Controller, the Honorable Mr. Hanna, who has recommended it for domestic consumption and secured a similar recommendation to the people of United States. The increased market, resulting from the action of these two gentlemen, has brought increased production and this increased production has meant prosperity to the industry. In the words of Mr. Britain, "prosperity breeds a disposition to improve conditions and methods." An excellent program of improvement has been recommended by Mr. Paulhus, and it behooves the members of the C.F.A. and every citizen of Canada to encourage the development of our fisheries along the lines so well delineated by the Chairman of the Educational and Publicity Committee of the Canadian Fisheries Association.

For at least one year let us bend our efforts in the direction of interesting our schools and colleges in the wonderful development that is about to take place in our fisheries and the opportunities which this industry will present when it is placed on a par as regards scientific and economic operation with the industries of agriculture, mining and those resulting from the development of our forests.

CONCENTRATES FROM THE SPEECHES MADE ON NATIONAL FISH DAY IN MONTREAL.

J. A. PAULHUS—

It is the purpose of the Canadian Fisheries Association to encourage and promote the development of the fishing industry.

All waters of the Dominion should be explored, surveyed and charted in order to ascertain the present and potential value of the fishing grounds therein, and assist those engaged in the production of fish therefrom.—**Marine exploration and navigation should receive much more attention in our schools and colleges in the future than it has in the past.**

A vigorous policy of re-stocking our inland waters should be instituted, and great care taken to allocate on each fishing ground the species best suited to it as regards condition of water, temperature and food.—**The study of pisciculture should be encouraged.**

The producer, distributor and consumer should be educated and kept informed concerning the most economic and scientific methods of handling and preparing fish.—**These questions should receive more attention in our class of general and domestic science.** — See page 412B for complete speech.

J. J. HARPELL—

It is not generally known that all the important deep sea fishing grounds of the world are situated in the Northern Hemisphere, and that such fishing grounds are only four in number, namely, the

eastern and western shores of the North Atlantic and the eastern and western shores of the North Pacific. The average Canadian does not appreciate that his country thus possesses the unique geographical advantage of being located in the closest proximity to two out of the world's four great deep sea fishing grounds.—One on the east coast and one on the west coast.

Another fact not generally appreciated is that the area of Canada's fresh water fisheries—220,000 square miles—is several times greater than the fresh water fisheries of any other country.

A third fact which we should not lose sight of is that, situated practically in the centre of Canada, lies one of the largest inland bodies of salt water found anywhere on the Globe. Little definite information has been ascertained regarding the varieties and abundance of fish in the Hudson Bay, but what little there is would indicate that ~~these waters are well stocked with a fine quality.~~

Such a survey of the potential value of our fisheries arouses the question, Why has this great asset not been more fully developed long ere now? The reasons are two, and two only:

First.—Little or no effort has been made to make these resources and the opportunities their development affords known to the people and to acquaint them of the excellent food value of their products.

Second.—The delay in the application of efficient means of development and in the introduction of proper education and training for those in the industry, coupled with the constant tendency to make the interests of the industry subservient to the political aims and ambitions of the party in control at Ottawa, and elsewhere, has kept the industry for years in a primitive stage of development, depleted many of the inland waters without properly re-stocking them, made the business of fish production and distribution hazardous and uncertain, and alienated from it the share of capital and man power which its potential value deserves. — See page 412D for complete speech.

DR. STAFFORD—

Few men in our fish hatcheries and other Government departments have acquired the habit of keeping themselves informed concerning the best there is to be known and the latest information regarding the work they have undertaken to do. It is indeed a regrettable fact that so few are even capable of acquiring from books, correspondence or conversation, the knowledge best calculated to keep them abreast of the work they have in hand. Very few of them have any libraries or subscribe to publications or are members of the scientific societies, or possess any of the other earmarks by which the efficient men in such positions are known. The average government ap-

pointee in the fishing industry seems to consider his work is done when he has secured his appointment, whereas, as a matter of fact, it is only begun.

MAJOR HUGH GREEN—

If the increased consumption of fish in Canada continues we will soon have little or none left for export to feed the people overseas, unless production is further developed. Where it is impossible to increase the number of men engaged in fish production, the only way of keeping pace with the demand is by engaging a greater number of trawlers. The trawlers of England were not only the backbone of the fishing industry, but the right arm of the Navy.

CAPT. F. W. WALLACE—

The main purpose which the Food Controller has in encouraging a larger consumption of fish is to conserve beef and other food stuffs which are more easily transported to and required by our boys and our Allies at the front. The matter of price is a secondary consideration, but it is a source of satisfaction to us all to know that his purpose is being achieved without an undue enhancing of the prices. The staple and seasonable fishes are being supplied to the consumers in Canada at prices far below those which the consumers of any other country have to pay. Furthermore, the people of this country are receiving their supplies of fish in a finer condition than ever before.

The campaign of advertising which is being conducted by the Publicity Committee of the Canadian Fisheries Association was opened on Saturday, and there is every reason to believe that it is going to prove a great success. The first day's mail, after the appearance of the first advertisement, brought over four hundred enquiries for the cook books that are being supplied on application to the office of the Food Controller.

A. H. BRITTAİN—

Increased output in any business means prosperity, and prosperity breeds a disposition to improve conditions and methods. We are beginning to realize, as a result of the work of the Canadian Fisheries Association, the value of the application of study and scientifically trained minds to the development of our business. The time is not far distant when companies such as my own will engage a technically trained man whose business it will be to assist in directing the operations of our company along the most improved scientific and economic lines and whose observations and determinations may not only be of service to the company engaging him, but of value to the whole industry.

W. R. SPOONER—

Transportation is one of the most difficult problems which the distributors of fish in this country have to cope with. The centres of our population lie from one thousand to one thousand five hundred miles from our fishing grounds on the Atlantic, and nearly three thousand miles from our fishing grounds on the Pacific. We have no reason to feel discouraged, however, when we realize that fresh fish is being brought over these great distances and distributed in Montreal and Toronto in as fine a condition as are those that are being landed in London from Grimsby and other British fishing ports that are only a few miles away.

J. J. STANFORD—

It may interest you to know that the records in my office show a very considerable reduction in the consumption of meats and a proportionate increase in the demand for fish. This is largely due to the institution of Tuesday as a second fish day in the week. My customers have pretty generally acquired the habit of ordering fish instead of meat for Tuesdays. Two fish days a week, viz., Tuesday and Friday, gives a better speed, and thus encourages the retailer to pay more attention to his supplies of fish. In fact, the campaign for fish consumption is forcing the retailer to give more attention to his stocks of fish in order that he may be able to satisfactorily supply the requirements of his customers.

NEW SOURCES OF FISH FOODS.

We are much indebted to one of our readers, namely, Dr. Robert T. Morris, of 616 Madison Avenue, New York City, for some excellent suggestions concerning three food products which, heretofore, have been overlooked. Dr. Morris' suggestions are as follows:—

"Apropos of the subject of fish food supply at the present time, it seems to me that special effort might be made to employ at least three extremely abundant materials. On the Pacific Coast chiefly, but also on the Atlantic Coast, the salmon preserving plants either throw away or convert into fertilizer the heavy mass of cecal appendages of the salmon. I have seen vast quantities of this highly nutritious and most delicious food supply dumped into the water. The waste corresponds to the waste of liver and roe of lobsters, in the fact that one of the best parts is wasted because of the association of ideas. The fatty cecal appendages of the salmon are not only rich in nitrogen and fat, but when cooked in any one of a half-dozen methods are most delicious for the table. The cleansing required is much less than the cleansing required for tripe.

"Another wasted product consists in the use of cap-

lin on the Atlantic coast, where they are captured by the ton and used for fertilizer. If this most excellent little member of the salmon family were to be preserved in some way for the larger markets, a great addition to the food supply would be forthcoming. In Newfoundland a good many families save a barrel or two of caplin dried in the sun for winter use, but I have never seen them in the market.

"Another food supply which has seldom been utilized by anyone excepting Indians and naturalists on exploring expeditions, consists of the mollusk pteropods. These occur in enormous quantities on the surface of the sea at certain times in the early summer. They may be prepared in many ways, and when using them in camp I have often wondered at their not being made use of by civilized people, as they sometimes are by explorers and Indians."

VALE, MR. HAZEN.

In the shake-up of the Cabinet, the Hon. J. D. Hazen, Minister of Marine and Fisheries, retires.

During his term of office in administering the Canadian Marine, Canadian Navy, and Canadian Fisheries, Mr. Hazen has not outshone his predecessors in office.

Opportunities came his way to do many things for the development of the Canadian fishing industry — the greatest of opportunities these war time days — but Mr. Hazen slumbered on, and for its prosperity and development today, the fishing industry is indebted to Sir Sam Hughes, former Minister of Militia, and Hon. W. J. Hanna, the Food Controller.

Mr. Hazen could have done a great deal more than he has done. Nothing of any great importance to the industry came directly from his hand. The moves he has made have been suggested to him by others, or by pressure.

Of course, we may be too critical. The requirements of a great national resource and industry may be secondary to that of the Royal Canadian Navy and Mr. Hazen may have been much engrossed with the needs of this particular service. He probably was.

FISH AND THE FOOD CONTROLLER.

Through the initial efforts of Sir Sam Hughes and a rigorous follow up movement on the part of the industry and its advance agent, Major Green, a large overseas export trade in fresh frozen Canadian fish has been built up during the past year, and a great home consumption is being created now. Both are the outcome of the war, but even when the war is over, the industry will still retain the benefit of the stimulus.

The Food Controller, in naming meatless days, followed the lead of the Canadian Fisheries Association and chose Tuesday and Friday with the recommendation that fish be substituted for beef and bacon. Since his order went into effect, the home consumption of fish has increased greatly.

This gives the producers and distributors in the fish trade a splendid chance to build up a permanent business. It is the greatest opportunity we have ever had, but it is as well to sound a note of warning. When the public, endeavouring patriotically to carry out the wishes of the Food Controller, increase the demand for fish, it is exceedingly bad business on the part of

the trade to raise prices with the increased consumption.

The Food Controller is not proclaiming the substitution of fish for meat because he wishes to build up the fish business. That follows in due course, but the prime motive is to reduce the consumption of beef and bacon in order that more can be exported to Great Britain and France.

We are facing a world famine. The War is more likely to be won now by the Food Controllers of Great Britain, France, Canada and the United States than it is by the Allied armies and navies. The German submarine activities have cut down shipping enormously: sources of supply are cut off for lack of ships to carry cargoes, and in fighting the submarine, the Allies have been forced to utilize almost all of their huge naval forces. Meats can no longer be imported from the Argentine, New Zealand and Australia. The voyages there are too long and the routes cannot be adequately protected from U-boat depredations. The result is that Britain and France must be supplied from the nearest protected source — Canada and the United States.

GERMANY IS STAKING EVERYTHING ON STARVING THE ALLIES! It is her last card. The best brains of the Allies are working overtime to beat her at the game. Ships, ships, and more ships are being turned out by the yards in the United States, Canada and Great Britain to catch up on the depleted tonnage. Grain and meats have to be supplied and rushed across from North America to feed the hungry millions of soldiers and inhabitants of Britain and France, and in order that we may be able to produce enough to beat Germany's schemes, it is necessary that we in Canada conserve and produce as we never did before.

Fish foods have attained an importance and prominence such as they never attained before. We have the fish in abundance, and while we are not fully equipped with the most modern means of catching them, yet the Industry is capable of supplying any home demand. BUT IT MUST BE CHEAP! Dear fish will not save beef and bacon, and the public will not be stampeded into eating fish if it is as dear as meat.

It is up to the fishermen and producers to do their bit. This is NOT a time to make big profits. The Food Controller is not fixing prices. He is leaving it to the fish trade to do the right thing and be content with fair margins. Profits will come with increased volume of business, and the producer or retailer who raises the price of fish without reason is not only a traitor to his country, but is paving the way for actions on the part of the Food Controller which may lead to the fisheries becoming a Government Monopoly and a natural resource operated by the State. This is a step we trust may never have to be taken.

ONTARIO FISH SCHEME UPSETS TRADE.

It is to be deprecated that the Ontario Government went into the Fish business in the manner it has. We do not criticise the commendable object which actuated the scheme, but the method of distribution has been rather unfortunate, inasmuch, as it has only served to defeat the end for which it was started.

The supplies from Lakes Nipissing and Nipigon have been very small, with only a few thousand pounds of fish distributed in small lots to dealers in various Ontario towns weekly.

These fish are very quickly snapped up by consum-

ers at the low cost prices set by the Government, and when the dealers attempt to sell the fish they purchase through the regular channels, the customer balks on the extra price, refuses, and considers the retail fish man is trying to rob him.

This has had the effect of throwing fish back on the wholesalers, or cutting down orders. With the Ontario Government selling fish at less than cost, it is not possible for others to compete against them and make a fair profit.

The Ontario Government would show more wisdom by fixing the spread on prices of Ontario Lake fish if they wish to treat the consumer to cheap fish, and make use of the regular channels for distribution of the product of the Government fishery.

It is not fair to place whitefish from Nipissing or Nipigon at 12½ cents in competition with whitefish sold through the regular channel at 15 cents. The latter price represents only a fair margin of profit, while the former represents no profit at all. The whole scheme engenders bad feeling and disorganizes trade, and that, without doing any good for the consumer. The Ontario fish scheme is more of an irritative than a palliative.

The Ontario Government Department operating the Government Fisheries at Lakes Nipigon and Nipissing, plan to increase the supplies from these waters, by purchasing herring, whitefish, etc., from the Lake Erie fishermen at a price to be set. The Government will distribute the fish through the channels already organized for the Nipigon and Nipissing catch.

Mr. John P. Babcock, Assistant Commissioner of Fisheries of British Columbia, has been appointed as Pacific Coast adviser to the Fish Committee of the Food Controller's Office.

The steam trawler "Orontes," of the A. R. Loggie Company, landed 110,000 lbs. of ground fish at Port Hawkesbury recently on her initial trip since her purchase.

Major Hugh A. Greene returned to Montreal on October 30th. He expects to be permanently located here now.

REGISTRATION OF WHOLESALE HOUSES.

By an Order-in-Council, every wholesale house in Canada dealing in food stuffs is required to register with the Food Controller's Office, Ottawa. Heavy penalties are attached to any omission or failure to register. Any wholesale fish merchant who has not received a registration card can procure one from the Food Controller, Ottawa.

CANADIAN FISHERIES ASSOCIATION ACTIVITIES.

The center of administrative interest in Canada's fishing industry seems to have shifted from the Marine and Fisheries Department to the Food Controller's Office. To the Fish Committee of that Office, officials of the Canadian Fisheries Association have been of much assistance and a number of the Association's officers are on various Advisory and Provincial Boards assisting the Food Controller.

In transportation problems, Mr. W. R. Spooner of

the C. F. A's Transportation Committee and Vice-President A. H. Brittain have been in almost daily consultation with Mr. W. E. Ireland, Traffic Manager of the Fish Committee, and reports are being made upon every car of fish leaving Atlantic coast points for Quebec and Ontario in order that delivery may be expedited. Plans are being formulated with the railroad companies to increase facilities in every way.

In Publicity work, Mr. J. A. Paulhus and Mr. J. J. Harpell of the C. F. A's Publicity Committee, are assisting the Food Controller's Fish Committee in organizing the Eat More Fish Campaign. In Publicity work, the Association intend to lend their best efforts to the Food Controller through its members all over Canada.

Directors of the Association in various sections of the Dominion are being called upon for advice and assistance and are giving it willingly.

In stimulating the demand and educating the public to eat more fish, the Association's members will be called upon to do most valuable work. What the C. F. A. has done in the past, and what it will be called upon to do in the future, fully justifies the Association's existence, and its establishment three years ago was undoubtedly one of the most progressive steps undertaken by the Fishing Industry in all its history.

The Association's Secretary, Capt. F. William Wallace, who left last spring for service in the Navy, has been recalled and is now acting as Secretary to the Fish Committee of the Food Controller's Office, Ottawa.

PACIFIC FISH EXPRESS SUBSIDY AMENDED.

An Order-in-Council has been passed, effective on October 15th, in which the Government Express Subsidy of 1-3rd on Pacific fresh and frozen fish from British Columbia ports to points as far east as the eastern boundary of Manitoba, has been cancelled on halibut and salmon, and altered to a new subsidy of 2-3rds of the express or freight charges on less car load lots of other Pacific fish such as black, grey, ling and red cod, skate, grey fish and flat fish (except halibut.)

The subsidy was taken off halibut and salmon, as it has been proved that the market for these fish is more than equal to the supply. By placing and doubling the subsidy on the other fish, the Marine and Fisheries Department intend assisting the recommendations of the Food Controller's Fish Committee that Pacific cod and flat fish should be utilized by Western consumers and purchased by them at a reasonable price.

AN INTERIM REPORT FROM THE BRITISH COLUMBIA SALMON COMMISSION.

The Deputy Minister of Naval Service has announced the first of the findings of the B. C. Commission in a letter to the secretary of the B. C. Salmon Cannery Association, which reads as follows:

"I beg to inform you that the Special Commission which was appointed to investigate the salmon fisheries in district No. 2, and the question of the prohibition of the export of salmon other than sockeye in a fresh state, has conveyed its findings to the Minister on the question of the prohibition of export.

"The Commission did not find itself able to recommend that the export of such salmon should be prohibited at

the present time, but appreciating the necessity for affording these salmon adequate protection they recommended an extension of five days in the annual close time, so as to make the fishing season end on the 9th, instead of on the 14th November, and in order that this close season might be effective they recommend that no net fishing for salmon of any kind be allowed during this close time.

"These recommendations have been approved by the Minister, and the necessary steps are now being taken to amend the regulations accordingly.

"You will be good enough to so advise the members of your Association."

ALBERTA BRANCH OF THE CANADIAN FISHERIES ASSOCIATION.

At a meeting of the Alberta Branch of the Canadian Fisheries Association, the following officers for the ensuing year were elected:—

- Honorary President: F. H. Miller.
- President: W. L. Campbell.
- First Vice-President: A. Menzies.
- Second Vice-President: M. McInnis.
- Third Vice-President: J. W. Clarke.
- Fourth Vice-President: Homer Lyons.
- Secretary-Treasurer: A. S. Duclos.

General Purpose ommittee. — J. W. Publicover, W. Slater, C. Christian, D. H. Watson, E. Menzie, S. Darroch, F. W. Miles, W. M. Armstrong, E. Cressy, R. L. Shimmin, J. Clements, W. Wigle, W. C. Jones, J. Phillips, J. Weicker.

A special committee was appointed to wait upon the Food Controller and his Alberta representative. This committee was composed as follows:—W. S. Campbell, A. S. Duclos, R. L. Shimmin, M. McInnis, W. Menzie.

The General Purpose Committee was instructed to confer with the Board of Trade in matters relating to the fishing industry of Alberta. It is understood that the Provincial Government was about to appoint a Fish Commissioin for the purpose of assisting the Food Controller in local matters, and the Secretary-Treasurer was authorized to submit to the Provincial Minister of Agriculture the names of the following gentlemen from among which members for this Commission should be selected:—R. L. Shimmin, W. Campbell, A. S. Duclos, M. McInnis, W. Menzies.

A vote of thanks was also passed for the good work that had been done by the Organizing Committee appointed last spring, and coupled with this motiion was a resolution approving of all that had been done by this Committee.

A CORRECTION OF MISSTATEMENTS.

As much publicity, of a character detrimental to the best interests of the Alberta fishing industry, has recently been given in the daily press by parties whose lack of accurate knowledge rendered them incapable of making correct deductions, the General Purpose Committee of the Alberta Branch of the Canadian Fisheries Association submit the following information:

Lesser Slave Lake and Lac La Biche are the largest producing lakes, both in area and quantity of output, in Alberta. The cost of production of whitefish on these lakes is as follows:

Lesser Slave Lake.

Based on output of 10 cars (200,000 pounds) of dressed whitefish, cost of plant, boats, etc., to attain

this output is \$5,000 as a minimum. Plant, etc., is written off in five years, as experience has shown this to be the life of the average fish plant. Interest is calculated at 8 per cent., the prevailing bank rate in Alberta.

	Per Hundred Pounds.
Paid to fishermen	\$3.00
Collecting . . . . .	.50
Packing and labor . . . . .	.50
Ice . . . . .	.10
Box . . . . .	.60
Fixed charges and depreciation . . . . .	.70
Salaries . . . . .	.45
Expense . . . . .	.10
Refusals and bad debts . . . . .	.25
	\$6.20

Lac la Biche costs are 60 cents per hundred pounds higher owing to the practice of the buyers on that lake purchasing the fish round and not dressed. Last summer the producers sold their fish at 7 cents per pound f.o.b. the Lake points in car lots. Thus their profit was 80 cents per hundred pounds—a totally inadequate profit, as the producers had to guarantee their product and thus become responsible for loss in transit. The profit for the Lake la Biche producers was only 20 cents per hundred pounds, which can only be described as "unlivable" profit. In reply to the allegations that an undue profit is made on Alberta whitefish, a table is appended showing the cost to the retailers of Edmonton and Calgary of Lesser Slave Lake whitefish:

	Cents.
Cost to the retailers at Lake	7.
Express 1.15 and 25 p.c. for ice and box	1.44
Transfer from E. D. & B.C. to city . . . . .	.25

Cost of whitefish in Edmonton (per lb.) 8.69

Add express from Edmonton to Calgary 1.20 per hundred plus 25 per cent. for ice and box—\$1.50 per hundred pounds, thus the cost of whitefish in Calgary is 10.19 cents per pound.

If the wholesalers in Calgary or Edmonton purchase the fish in car lots, the price to the retailer would have to be higher as, although the express on carloads is less, the wholesalers' legitimate profit would make the price higher to the retailer, and in actual practice this is the case. Up to recently the wholesalers' prices to the retailer have been 9¼c in Edmonton and from 10½c to 12c in Calgary. In Edmonton, on the market the public can purchase whitefish at 10c and in the stores at 15c, or 2 lbs. for 25c, a very reasonable margin of profit to take care of delivery, bad debts, rent, wages, etc., etc. We have no hesitation in stating, that in no part of Canada is the fish industry handled on such a small margin of profit, but, in view of the increasing cost of labor and materials, the cost of whitefish to the public must increase at an early date (if those in the industry are to make the living that is their due), and if the present regulations are continued.

Unjust Regulations and Restrictions.

Under existing regulations in Alberta a fisherman can only use 300 yards of 5½ inch mesh gill net, and experience has shown that no man can make a living using 300 yards of net in the lakes of Alberta. In Manitoba both on the large and small lakes a fisher-

man can use 1,500 yards of net, and in addition, the Manitoba fisherman has a longer open season than his Alberta confrere.

The Manitoba lakes are still open for fall fishing, but the Alberta lakes have closed since early in the summer.

The limit of catch for the summer season on Lesser Slave Lake is 500,000 pounds of dressed whitefish. The superficial area of Lesser Slave Lake is 1,500 square miles. The fish average dressed weight three pounds, so that out of each square mile of water only 115 fish are allowed to be taken, and Lesser Slave Lake has more feeding grounds than an Eastern Lake of ten times its area.

It should also be pointed out that Alberta fishermen are restricted to the use of nets whose mesh is not less than 5½ inches. This Association states emphatically that it is physically impossible to deplete or even injure, the fish supply of a lake with nets of such mesh. As proof Lake Wabamun, although fished for twenty years, this summer produced more fish than ever, and of a better quality. The open season on Lesser Slave Lake lasted 21 days, the ridiculously small limit of catch allowed by the Dominion Government being caught in that time. It is evident that no fisherman can afford to equip himself with boats and nets for such a short season. As a consequence, many men found themselves in debt as a result of their "season's" work.

Repeated representations have been made to the Minister of Naval Service, but no relief has been afforded. The Government is constantly urging greater food production—the Alberta Lakes are teeming with fish and the fishermen are ready to harvest them and help reduce the high cost of living.

If granted reasonable working conditions, this Association will undertake to supply the Alberta market with ample quantities of the finest fish at the lowest possible price.

Exception has been taken to the export of fish to the United States. We point out that the Alberta market does not provide an outlet for the large quantity of yellow pickerel and jackfish that our lakes produce. Again the United States must always be our market for any surplus, as every other province in Canada, without exception, is amply provided with fishery resources, exceeding even those of Alberta.

The Association wishes to emphasize that at all times preference is given to the home market, and if the Dominion Government will allow fair regulations and working conditions, fish can be supplied to the Alberta consumer at cheaper prices. If the following regulations are at once put into force, the Alberta fishermen and producers will be enabled to cheapen food prices, and do their bit "To win the War."

- (1) Same regulations with respect to nets, as are now in force in Manitoba.
- (2) Open summer season on Alberta Lakes to be from May 15th to September 30th.
Open winter season November 20th to February 15th.
- (3) **Limit of catch for Lesser Slave Lake:**
 - (a). Summer season two million (2,000,000) pounds.
 - (b). Winter season one million (1,000,000) pounds of dressed whitefish.
During the summer export only to be allowed from August 1st to September 30th.

(4) No closed season for Jackfish, as this fish is very destructive of the more edible whitefish.

(5) **Limit of Catch for Lac la Biche:**

(a). Summer season three hundred and fifty thousand (350,000) pounds of dressed whitefish.

(b). Winter season two hundred thousand (200,000) pounds of dressed whitefish.

(c). No closed season for Jackfish.

(6). The appointment of a Fisheries Commissioner for this province, who will have a practical knowledge of the industry and of marketing conditions, and who will give adequate inspection to every phase of the industry.

The Association points out that only those lakes touched by a railroad can be commercially fished in the summer time, and thus after the war is over, it would be advisable to close such lakes in the winter, and fish those lakes back from the railroads during the cold weather when the snow allows of transportation.

Announcements

October 24, 1917.

The Editor, "Canadian Fisherman,"

35-45 St. Alexander Street, Montreal, Que.

Sir,—As you are aware, this Department for a number of years past has been paying one-third of the express charges on all shipments of fresh and mild cured fish from the Pacific coast to points in the three Prairie Provinces, as well as from the Atlantic coast to points in Quebec and Ontario.

With this assistance, the demand for halibut and salmon from the Pacific coast has been so increased that, coupled with the demand for the export markets, the supply is not equal to requirements. It is, therefore, unnecessary for the Department to continue the payment of any portion of the transportation charges on these fish.

While fishing for halibut different kinds of cod and flounders of excellent edible value are taken, but as there is little demand for these at the present time, they are largely thrown away. These fish should be in general use in the Prairie Provinces, as they can be quickly and cheaply distributed there, and in order to enable dealers to create a widespread demand for such fish, authority has been obtained for discontinuing the payment of any portion of the express charges on halibut and salmon, and instead, this Department will pay two-thirds of the transportation charges on all shipments of the different kinds of cod and flounders, as well as of grayfish from the Pacific coast to points in Alberta, Saskatchewan and Manitoba, no matter whether these fish are forwarded in less than carload or carload lots, or by express or freight. This arrangement went into effect on the 15th of this month, and it is hoped that with such cheap transportation facilities the people of these provinces will soon avail themselves of the opportunity of procuring these cheap, yet excellent, fish, and thus reduce the cost of living to them, and at the same time find a market for fish which are now being largely wasted.

I am, Sir,

Your obedient servant,

G. J. DESBERATS,

Deputy Minister of the Naval Service.

Ottawa, October 24.

Vancouver, B.C., October 12th, 1917.

Dr. A. B. McCallum,

Chairman, Bureau of Industrial Research,
Ottawa,

Sir,—An intimation of your wish to receive a statement regarding the unsatisfactory condition of the Fraser River salmon industry, and reasons why the Royal Fisheries Commission should fully investigate them, having been received in your telegram of September 24th. ult., to Messrs. H. Bell Irving & Co., and shown to the Members of this Association, I have been instructed to submit the following brief statement of facts bearing upon the subject, for your esteemed consideration:—

The present deplorable condition of the Fraser River salmon industry has arisen primarily by the fact that the fish in their migrations to the head waters of the Fraser River (to spawn), from the Pacific Ocean, have to traverse waters belonging to the United States and Canada respectively, before reaching their objective.

Their progress is arrested by regulations affecting their capture, which vary in character, scope and enforcement in the respective waters.

On their entrance to the Straits of Fuca, about 100 miles from Puget Sound, they were met this year by a fleet of 416 purse seines (500 fathoms each), and 147 drag seines (300 fathoms each), and fished continuously, up to the mouths of the 280 traps installed in the waters of Puget Sound, in addition to which 478 gill nets (300 fathoms each) were fished in various areas in American waters.

These appliances took a first heavy toll of salmon, equal in fact, to about three times the number taken by Canadian fishermen in the home waters of the fish.

In contrast with this policy, on the Canadian side from Cape Flattery, upwards, only 9 traps and 14 purse seines were licensed this year.

On reaching the Fraser River estuary, and in the adjacent waters of the Gulf of Georgia, the remainder of the fish had to run the gauntlet of 2,600 gill nets (150 fathoms each) this year, fished from Sunday evening at 6 p.m., to midnight on the Friday following.

Then again—gill net fishing is permitted to Mission Bridge has been sought by the canners, but has not which has entirely nullified the benefits of the weekly close season, as the up river boats go out on the Sunday night and Monday, and catch the fish which had reached there during the previous week end.

The closing of the Fraser fishing above Westminster Bridge has been sought by the canners, but has not been conceded by the Government.

The marvel is that any salmon at all are able to reach the spawning grounds—and the serious condition of the industry has long been recognized by the thoughtful canners and fishermen.

Twenty years ago a dam was built across the entrance to Quesnelle Lake, the most important spawning area on the Fraser, which for 5 or 6 years completely blocked the salmon from entering, and was the means of depleting the subsequent supply. A fishway was afterwards put in, but the mischief was done and that area has never been restored to its former value.

In 1912-13 the Canadian Northern Railway constructors were allowed to dump the debris from their right of way all down the canyon of the Fraser, and in doing so narrowed the channels and filled in numberless spaces in back eddies wherein the salmon had rested on their way up stream. This condition was

aggravated by the collapse into the river of portions of the mountain at Hell Gate, in 1913-14, which completely blocked the channel, the result being that hundreds of thousands of spawning sockeyes failed to get through and died of exhaustion below Hell Gate—the dead fish being piled upon the banks for miles, and others being carried down towards the sea.

Though strenuous efforts were made by the Dominion Fisheries Officials to mitigate the obstructions in time to permit some of the fish to pass up, only a comparatively small number got by. Careful inspection by Fraser River Officials made it certain that in 1917 no large run could be expected, and that this has proved correct the results of this year will show.

In 1909 there was collected 98,000,000 sockeye eggs at the Fraser River Hatcheries, which was just the same quantity as in 1905—but in 1913 only 86,000,000 were received, of which 25,000,000 were collected below Hells Gate and Scuzzie Rapids, after the slides before referred to occurred; and were incubated in the Harrison Lake Hatchery.

This year the Provincial Fisheries Department reports that the Fraser River spawning beds will be no better seeded than in average off years, which have also shown a serious depreciation since 1910.

The packs of Fraser River sockeyes from 1901 have shown steady decreases, except in 1913, the year of the Hell Gate disaster, which was 142,000 cases more than in 1909—and gave rise to a hope that conditions were improving—for as will be seen by the following statement, the decrease has been steadily increasing:—

Year.	Fraser River packs of	
	Socketeyes, Cases.	Other Grades, Cases.
1901	920,313	69,939
1902	293,477	33,618
1903	204,809	32,313
1904	72,688	56,215
1905	837,489	39,647
1906	183,007	57,479
1907	59,815	103,301
1908	63,126	26,058
1909	543,248	24,955
1910	133,045	90,103
1911	58,487	242,857
1912	108,784	65,137
1913	684,596	47,463
1914	185,483	142,907
1915	98,040	200,159
1916	27,394	79,046
1917 Estimated	170,000	Still packing

of which 18,700 cases were filled from sockeyes caught in traps in the Straits of Fuca.

Since 1914 the gravity of the situation has become truly alarming. With a pack on the Fraser of only 89,040 cases of sockeyes in 1915—a drop to 27,394 cases in 1916. Whilst the estimated sockeye pack of 170,000 cases this (1917) season represents only 25 per cent. of the sockeye pack of 1913.

This relative 25 per cent. of the salmon in transit this year, as compared with 1913 was only obtained by the intensive efforts of the fishermen, anxious to make the most of the high prices being paid for sockeyes (35c to 75c per fish), and of the Canners to get up a pack.

It is reasonable therefore to estimate, that as only 25% of the salmon which passed up in 1913 spawned in the river and returned from the sea in 1917—the numbers now on their way up to the spawning grounds must be reduced, for the reasons above stated, much

below the 25 per cent. ratio; so that even 25 per cent. of the 1913 pack cannot be reasonably expected in 1921.

Independent reports state that the Indians all up the Fraser complain that they have been unable to secure their winter supplies; that at Quesnelle and other points very small numbers of sockeyes have appeared on the spawning grounds; whilst up to date the Harrison, Birkenhead and Seaton Lake Hatcheries have got comparatively few sockeyes, although they should have secured nearly half their supplies at this time of the year.

I enclose herewith a concise history of the salmon industry from its commencement in 1867, which shows that during its best days it was a hazardous business, and that most of the changes made in ownership were caused by inability to make the business profitable.

If conditions are not soon improved, the sockeye salmon industry on the Fraser River and Puget Sound will become extinct.

In 1905 the depletion of the supply of sockeyes during the off years, became so painfully apparent to the Cannerymen on Puget Sound and the Fraser River, and to the authorities in both countries that joint efforts were made to remedy the shortage during the "off years," but unfortunately no effective results accrued.

Now the condition of the whole of the four years is deplorable, and demands the sympathetic consideration of both American and Canadian Governments, in order to devise some scheme or measure for its restoration.

The causes for this depletion may be summarized as follows:

1. Over fishing by Puget Sound operators, especially purse seines.
2. Over fishing by Fraser River operators with too many gill nets.
3. Improper fishing above New Westminster Bridge, which has nullified the intention to protect the sockeyes after getting so far up the River, during the weekly close times of 36 hours.
4. The capture of spawning fish by Indians, on their way up to and upon the spawning grounds.
5. Slockades and log jams on streams frequented by sockeyes, which bar their progress, or render the spawning grounds useless for the fish.
6. The absence of a "Local Fishery Board" on this Coast, with power to deal, under the Minister of Fisheries, with all matters pertaining to the economic administration of the British Columbia Fisheries; along the lines of the present "Railway Commission."
7. The injurious effects of political influence in respect to the administration of Fisheries affairs in British Columbia.

It is respectfully submitted that the foregoing facts in relation to these, the most important fisheries in Canada, will justify the thorough investigation by your Honorable Bureau of Industrial Research and of the Royal Fisheries Commission to which reference was made in your telegram of September 24th, 1917, aforesaid.

All which is respectfully submitted.

B. C. Salmon Cannery Association,

(Sgd.) W. D. BURDIS.

Secretary.

P.S.—In making inquiries from Chief Inspector of Fisheries, Cunningham, he stated he had received the

following report relative to the salmon arrived at the different Up River points on the Fraser this season: September 10th, 1917. From overseer Perkins report on trip of inspection to Stuart, Fraser and Francois Lakes.

"During my recent trip to Stuart, Fraser and Francois Lakes I found that many more sockeye are reaching these lakes and the creeks running into them than have been seen for several years past. So far there seems to have been two runs, the first about the 10th of August and the second during the last week of the month."

"I am getting the same favorable reports from the North Fork of the Fraser, Clearwater River, Slim Creek and other streams tributary to the Fraser and Nechaco."

WESTERN PACKERS, LIMITED, HAS A GOOD YEAR.

Becomes Important Factor in Fishing Trade.

Western Packers, Limited, is the youngest big company in the canning and fresh and frozen fish business in British Columbia, and this year is the first of their operations under the re-organization by which several of the keenest men in the industry have held responsible positions in the affairs of the company. The year is ending with gratifying results to all concerned in all departments of the company.

Their new cannery at Smith's Inlet put up this year, did as well as its competitor with sockeyes, but there were not a great number of these fish packed at the Inlet, for as happens every five years there, the sockeye took a year off. They will be there next year there is no doubt, for that is the way of nature up north, and this fact is verified by Capt. Chambers, the manager of the Smith's Inlet cannery, and one of the most experienced and capable cannery men on the coast. The Captain did not attempt to go in for the cheaper grades of salmon this year, but satisfied himself with a fair pack of sockeye. The new cannery is one of the most complete in British Columbia.

Shushartie Bay and Butedale did well for the Western Packers, Limited, in all lines. Manager Jefferson at Butedale made a record pack of pinks, and put up large quantities for the foreign trade. These two plants have proven their fitness and now only remains their development to capacity.

All the fishing grounds of the company, as well as individual contractors kept the fresh fish department well supplied with all varieties of fish, so that F. E. Payson, general sales manager, has been able to fill the large demands made upon him by the increased consumption of fish in Canada. He specialized, as formerly, in Royal Chinook salmon and found that his repeat orders have exceeded his expectations. With an eye to the winter when fishing is difficult, Mr. Payson has put aside considerable frozen fish to take care of his regular customers.

Secretary Hamilton is engrossed in the details of expansion plans for next season, in which additions to the present plants are contemplated.

Western Packers, Limited, has become a factor in the fishing and canning industry of British Columbia.

The Aims and Obstacles in the Way of the C. F. A.

To Mr. J. A. Paulhus, chairman of the Education and Publicity Committee of the Canadian Fisheries Association and one of its members, Mr. J. J. Harpell, was assigned the task of opening the discussion at the meeting of the Montreal Branch of the C. F. A. which met at the Windsor Hotel, Montreal, on Tuesday evening, October 30th, to pick fish bones together and celebrate the anniversary of Canada's National Fish Day. The presentations of these two gentlemen are here given in full:

MR. PAULHUS.

I venture to say that if the old proverb, "It is an ill wind that blows nobody good" were ever applicable, it, strangely enough, is in this present abominable war.

From this chaos of atrocities and extermination of life, without parallel in the history of the world—from this terrible issue, sublime in valorous actions on the one hand and despicable for its horrors on the other, a great lesson must be learned. Not the lesson that might is right, but that **organization is power**.

Though we cannot admire the Hun for his principles, though most of his maxims and methods are repugnant to our ideas of civilization and government, we must nevertheless, give him credit for a talent for organization, which, as shown in his war methods, has been a revelation to the whole world.

It is against this complete and perfect machinery that we have been struggling for over three years. We have tried to shatter it with iron and blood, at the cost of cruel sacrifices; and though we have given it severe blows, it still resists our united efforts. Some day, and not far distant, we hope, it will crumble under our pressure, because we have learned to organize. We have become convinced that we have to fight this enemy with his own weapon and out-class him in organization. Organization will win the war. There are, however, other battles to be fought and other victories to be won in the world of politics, economics and industry, and these can be achieved only by organization.

We have already, as an Association, drawn our plans of battle for the future; we have delineated a programme with certain rules to follow. This is not sufficient, however. This programme does not answer, or, rather, will not answer to the ideals for the future of our Association. We must, therefore, enlarge this programme by a policy which will be broad enough to shelter our aspirations, and to answer at all times, and under all circumstances, to our devotion and efforts in the great cause of the fish interests. This policy, in my opinion, to be sufficiently comprehensive, should comprise these three divisions, viz.:

Discoveries, Conservation, Information.

Under the heading of Discoveries we could put all research work. When geographical discoveries are considered, we shall find that, in fact, we have a great field for exploration and activity. What is known of our fishing localities and waters is very limited, indeed, compared with the unknown or imperfectly known waters. Our fisherfolk, as all fisherfolk, are great routiners, and they never, as a rule, depart from the beaten track. Each season as the sun rises and sets, the seas stormy or calm, you will find

them at the same posts from generation to generation. They will not consent nor decide to try new ground until long after its discovery has been directed to them and sufficiently tried as to chances of success. They cannot be depended upon to open up new avenues to the industry, and this is easily explained. Not having any technical knowledge of fish life and habits, they cannot be expected to speculate on such matters. This is where our work of discovery and research will be important.

To be practical discoverers some expedition will need to be organized. I believe that a full and complete survey of all our waters—coastal and inland—should be thoroughly and systematically mapped out. They should be able without any danger of misleading the industry, to direct surely and safely anyone wishing to invest or instal fishing operations in any part of our country. At present it is impossible, for instance, to determine accurately what is our wealth of fish in such waters as Hudson Bay, Baffin's Bay and the Canadian Labrador. The same applies to all rivers forming the basin of the last named Bay, and even to the inland waters extending over the Laurentian Range, and the numerous lakes of all our North American territories.

Another field for discoveries would be to find more use for the fish that is already known and caught, but not marketed on account of being unknown and untried, due to the ignorance of the producer and to the indifference of the consumer.

We are told that year in and year out, from our most prolific banks, thousands of tons of good edible fish are lost owing to the lack of general knowledge.

While on this subject, may I recall to your mind that until, at the most, a couple of years ago, dogfish was considered a pest in our waters—good only to be destroyed or done away with by any means. Upon the representations and constant complaints of the fishermen, the Government undertook to exterminate the **pest** by the building of reducing plants, and even by paying a bonus to fishermen to provide the dogfish for these costly plants. With a little research work we should have discovered that dogfish—now grayfish—is a good food. It is marketed to-day, and found to be tasty, nutritious and wholesome. Instead of being a liability on our fish industry, grayfish has turned out to be a valuable asset.

There are other momentous discoveries to be made in the Dominion of our fisheries, such as the habits and life of the fish, the influence of the seasons, of tides, of currents, winds, storms, etc. All these should be studied thoroughly and intelligently for the benefit of all the branches of the fish industry. Of course, to be complete, there should be technical and scientific research work; for instance, a practical course of studies, a general curriculum of all matters pertaining to the industry—development, production, conservation, curing and fishing—should form the subjects to be taught by qualified professors. It would be found out in these particular studies why we should import from foreign countries manufactured products of which we possess in the raw state such an abundant supply.

The importance of finding suitable and profitable markets for our different fish food articles, should

also be taken up and specialized upon. Nothing will help the prosperity of our fisheries so much as the finding of proper channels to which to direct the wealth of our oceans, rivers and lakes.

After we shall have surveyed and mapped out all the fisheries of the country, it will be well to have them divided into districts where a constant watch and active vigilance shall be maintained. It will not be enough to have discovered what wealth of fish we possess, we must preserve it from destruction; we must increase it where possible, and this brings us to the second article of this policy, namely—

Conservation.

To understand well what conservation means, we might retrospect a little in the history of our fisheries, and we shall find that "once upon a time" we had in our Gulf regions a valuable resource in the oyster industry. We were growing, that is, nature was growing for us, a bivalve whose value as a luxury amongst the epicureans had no rival the world over. The far-famed Malpeque oyster is a thing of the past. The beds which produced this delicious oyster are practically extinct. How this came to be and why steps were not taken to prevent such a disaster is a matter that would take too long to explain. I may say, however, that as far as I know, political exigencies and interference, together with lack of foresight and public spirit on the part of interested parties, are responsible for this deplorable loss. Even now, bad as it is, in my opinion the industry could be revived if practical cultivation was resorted to; if we adopt the same methods and take the same means as our neighbors, who have an oyster industry, alive and prosperous, yielding a crop worth several millions of dollars annually.

Another valuable industry which has been subjected to a lot of vicissitude of late, and whose future is not very well assured—due to the same reasons I have given for the decline of the oyster—is the lobster industry. When we look at our fish statistics we shall find that it is near the top of our resources when value is determined. In spite of a maze of legislation, a labyrinth of regulations, the yield of lobsters is yearly dwindling. There is, however, as sure a remedy against the depletion of our lobster fisheries as there is against the depletion of fish in our inland waters. This remedy is pisciculture. This science has made rapid strides in the past few years, and the time is not far distant when it will be so perfect as to rapidly conserve our supplies wherever exhaustion is threatened.

It is well understood by those familiar with the subject that without a certain control over lakes, rivers, and all inland waters, it is very easy to lose much fish life. This has occurred on a large scale in the past, particularly with the species migrating from the sea to the rivers, and also with the fish in inland waters.

The only possible remedy is wise legislation, and the help of pisciculture or fish farming. No doubt a time will come when fish rearing will be as easy and as safe as cattle or poultry raising. In that day individuals will have their own ponds in which to raise their own supply of fish and thus increase the country's food supply.

Conservation will also look to the preserving and curing of fish, either for domestic or export purposes. Fish product easily deteriorates, and, consequently, requires a great amount of care in handling and pre-

paring for the use of the consumer. From the fisherman to the markets it is necessary that a process of protection, against any chance of injury, should be given the fish.

Fish is sold fresh, pickled, salted, smoked or canned. The tendency at the present time, not only in our own market, but in every market of the world, is to give preference to fresh or frozen fish. This is causing a revolution in the fish trade, and is due to rapid transit and cold storage facilities. Cold storage and quick transportation are the essential requisites of the fish trade at present. They are the forerunners of an era which will dethrone the use of preserved fish to a large extent.

We now come to the last article of our new Policy—
Information.

I would remind you that our Association is not merely an institution for fishermen, traders and carriers, but is also open to students, professors, and men with scientific knowledge bearing on the subject of biology and ichthyology. Without these our institution would be incomplete. We must be able to direct the fish interests of the country not only on commercial lines, but also in research and student branches, whose value to the scientific and economical world cannot be over estimated. Consequently, our Information policy may be divided into two parts—

Science and Economy.

Not very long ago the President of our Association, Mr. Wilson, in addressing a meeting of industrials, claimed that it was imperative for the efficient development of the fish industry that some set rules, based upon scientific lines, should be given to curers and packers, so as to provide a uniform quality of goods in every centre of fish production. Most of the representatives of the different industries present spoke of the necessity of technical education so as to do away with the rule of the thumb and pail, which is so prejudicial to the interests of the different industries of the country. Science shall remove these obstacles from the path of our activities. It will solve for us many arduous problems in our own industry. In fact, I believe that science is just starting to unveil some of the mysteries in which are wrapped the inhabitants and wonders of our oceans, lakes, and rivers.

Besides helping us to prepare our fish for consumption, science will also aid us in the knowledge of the migration of fish, their habits, the causes and reasons for their appearing and disappearing unexpectedly. Particularly in the cause of pisciculture from which we expect so much, the service that can be rendered by biologists is too obvious to be neglected.

To the fishermen, technical knowledge will be most valuable, as it will make their calling safer and more secure. The perils of the sea will be minimized through wider knowledge, production augmented and marketed in a more remunerative way.

The scientist will also increase the consumption of fish, because he will be able to appeal more certainly and more practically to the housekeeper. By scientific comparisons and deductions, fish food is presented to the consumer with more convincing force, and he cannot fail but surrender to the evidence of the argument.

The value of economic information cannot be ignored for just as good reasons. They are of a vital importance to our policy.

This will give us a detailed account of fish produc-

tion, species, quantities, values. A general statistics of fishing operations under proper headings should be tabulated, so as to give at any time the exact economical situation of the fish industry.

Questions of transportation, tariffs and customs' duties, and all matters pertaining to the exchange and sale of fish product and by-products, should be included so as to form not only reliable and interesting information, but it would prove also a source of inspiration to the association.

With the formation of such a policy, I may be permitted to say that we shall be in a position to command attention and respect both in the commercial and scientific world of this Dominion.

MR. HARPELL.

It is to our worthy chairman, Mr. Paulhus, that we owe the institution—national fish day—which we are assembled here to celebrate, and the excellent review of the work and aims of the Canadian Fisheries Association he has just given, stamps this institution with the earmarks of a thanksgiving day of the fishing fraternity.

He has asked me to say something, and I will endeavor to keep on the trail he has blazed.

It is a fact not generally known that all the important deep sea fishing grounds of the world are situated in the Northern Hemisphere. The valuable food fishes of the ocean seemingly inhabit only the shallow places of cool seas and all the continents of the Southern Hemisphere end too abruptly and have coasts that are too precipitous to allow of any extensive off-shore shoals. Moreover, none of the continents extend far enough into the Antarctic to secure the low temperatures that are required by the better class of food fishes. The warm tropical and sub-tropical oceans abound with fishes, but not of the varieties which the markets of the world demand. These markets must, therefore, look for their supplies of food fishes to the countries of the Northern Hemisphere, and to only such of these as lie in close proximity to the shallow places of cool seas, or what are generally known as fishing banks. Such places are only four in number, namely, the eastern and western shores of the North Atlantic and the eastern and western shores of the North Pacific.

The most important of these four fishing grounds, from the point of development and production, and the second in importance from the point of area, are the shoals of the Northeast Atlantic, lying off the coasts of Great Britain, Iceland, Norway, Sweden, Russia, Germany, Denmark, Holland, Belgium and France. Great quantities of fish have been taken from these waters continuously by the people of north-western Europe, since the earliest times of which there is any record, and the value of the present annual production is still not less than \$300,000,000. Of this, fully \$75,000,000 represents the catch of British fishermen. The value of herring alone, landed at the British ports, is fully \$25,000,000, and cod and haddock taken by the British fishermen accounts for \$15,000,000. These great staple fishes, namely, herring, cod and haddock, are sold either fresh, frozen, dried, smoked or pickled. Next in importance on these grounds are flat fishes, such as the halibut, the turbot, the sole, the flounder and the skate. These are generally marketed fresh or frozen. These waters also produce a small

quantity of salmon, mackerel, sword fish, etc., as well as shellfish, of which British fishermen take about two-and-a-half million dollars' worth.

The fishing grounds of second importance as regards development, and production, but least of the four as regards area, are those lying off the coasts of Japan and China. These waters have been fished for fully four thousand years and are still producing an annual catch valued at about \$100,000,000.

The grounds third in importance as regards production and development, but first as regards extent of area, are those lying off the shores of Eastern Canada and Newfoundland. They comprise the Grand Banks, which alone cover an area as large as that of Great Britain. These banks are the largest deep sea fishing shoals in the world. Lying just where the cold Labrador current rounds the south-east corner of Newfoundland, these cool shallow waters, with their abundance of food organisms, that have been brought down from the northern seas, form the greatest cod fishing banks of the world. These grounds include also the Gulf of St. Lawrence and the Bay of Fundy, as well as the shoals off the coast of New Brunswick, Nova Scotia, Newfoundland and Labrador. On all these shoals the greatest known quantity and the finest quality of lobster is to be found. Practically every other salt water fish may also be had here. These grounds are now producing an annual catch worth about \$45,000,000, of which Canada takes about \$15,000,000 worth, and the United States, Newfoundland and other countries about \$30,000,000.

The fishing grounds of fourth importance in point of production and third in extent of area are those lying off the west coast of Canada and Alaska. They produce about \$40,000,000 worth of fish per annum, of which Canada takes about \$15,000,000, and the United States and other countries about \$25,000,000.

The salmon, in one or more varieties, is found on all the four grounds above mentioned, but nowhere so plentiful as on those last mentioned. Of the total production from these waters, the salmon accounts for fully three-quarters. The next most important fish on these grounds in point of value of production, is the halibut.

It is, therefore, a fact not generally appreciated by the average Canadian, that his country possesses the unique geographical advantage of being located in the closest proximity to two out of the four great deep sea fishing grounds of the world, and these the first and third in importance as regards extent of area. On these two grounds are to be found practically all of the most important varieties of food fishes, and many of them, such as the herring, the cod, haddock, salmon, halibut and the lobster, in quantities unsurpassed by either of the other two grounds.

There is another fact that is not generally appreciated by the people of this country, namely, that the area of Canada's fresh water fisheries—220,000 square miles—is several times greater than the fresh water fisheries of any other country. These are scattered in the form of lakes and rivers pretty regularly across the country; but the majority of them lie well in the centre, comprehending the Great Lakes and Lakes Nipissing, Nipegon, Manitoba and Lesser Slave.

A third fact not generally appreciated is that, situated in practically the centre of Canada lies one of the largest inland bodies of salt water to be found anywhere on the Globe. In area the Hudson's Bay

is five times as large as all the Great Lakes combined. Its waters are shallow and cold. Mr. J. W. Tyrrell, the explorer and author, who spent a year and a half on the shore of the Hudson Bay, and who has made a study of the navigation and development of this body of water, a part of his life work, writes in 1908 as follows:—

"Little definite information seems to be available regarding the varieties and abundance of fish in the Hudson Bay, but certain it is that some of the finest fish I have ever seen or eaten have come from these waters.

"Salmon of the very finest quality are found in abundance. Lake trout are found in all the streams and lakes tributary to it. Sturgeon are plentiful in the Nelson and other rivers flowing into it. Whitefish are caught at the mouth of every river. Cod have been found at a number of points, and doubtless other varieties of deep sea fish will be found when properly fished for, but as yet this has not been done."

One of the best evidences that fish are there in quantity lies in the presence of such a large number of fish-eating mammals. The white whale, the sea unicorn, the walrus, the bearded seals, the harp seal, the ringed seal, the harbor seal and the polar bear are all found there in great numbers. Speaking of the white whale, Mr. Tyrrell says that he "has seen the surface of the bay appear as a living plunged mass of white from the presence of great schools of these creatures, nor do they appear to be appreciably diminishing, as some animals are. I observed them in apparently as great numbers in 1905 as I had in the same locality twenty years before, although large numbers of them are annually captured by the Hudson's Bay Company, who find in them a profitable source of revenue—the oil and hide of one animal being worth on an average about \$30.00."

Such a survey of the potential value of our fisheries arouses the question: Why has this great asset not been more fully developed long ere now? Why have the Canadian people been content for so many years with only a fish production whose annual value has fluctuated between twenty-five and thirty-five millions, when several times this was possible? This is a question to which I have given a great deal of thought, and I have come to the conclusion that there are two, and only two reasons. These may be set down as follows:

First.—Little or no effort has been made to make these resources and the opportunities their development affords known to the people of Canada, and to acquaint them with the excellent food value of their products.

Second.—The delay in the application of efficient means of development, and in the introduction of proper education and training for those in the industry, coupled with the constant tendency to make the interests of the industry subservient to the political aims and ambitions of the party in control at Ottawa and elsewhere, has kept the industry for years in a primitive stage of development, fished out many of the inland waters without properly re-stocking them, made the business of fish production and distribution hazardous and uncertain, and alienated from it the share of capital and man power which its potential value deserved.

In the solution of these important problems, the Canadian Fisheries Association has now been engaged

for little more than three years, and a frank exposition of some of the obstacles encountered during that time cannot but assist in the work that lays before you. It is only by experience that we learn to successfully evade or surmount the obstacles that lie in the way of progress. Some people may say that this is not the time for controversy concerning domestic affairs, but when these affairs have to do with the putting and keeping of so important a resource of food stuffs as our fisheries, in the highest state of efficiency and production, even the most extreme win-the-war advocate surely cannot find fault.

It takes years to produce a carload of beef, pork, or mutton, and twelve months before a new crop of grain or vegetables can be grown, but it requires only a few days to catch a carload of fish from the numbers that are to be found off the shores of Canada and in her inland waters. The production of this excellent food stuff is limited only by the available equipment and means of transportation.

Had the authorities at Ottawa acted upon the advice of your Association in the early stages of the war, the Canadian fishing industry would be better able now to supply one of the means to victory in Europe.

But the several trips which your Executive Committee made to the office of the Minister of Trade and Commerce were in vain. Also your urgent requests to the Minister of Naval Service, to have fish served to the soldiers came to nought. It was only when Major Green interested Sir Sam Huges in the matter that fish received a place in the soldiers' diet, and it was not until your Committee interested those in charge of the food problem that your urgent requests for better transportation facilities and more publicity to increase the consumption of fish in Canada received attention and produced results. To Sir Sam Hughes and the Hon. Mr. Hanna is due the credit for the increased production of fish for export to Europe and for home consumption the industry enjoys.

In like manner, the several representations that were made to the Minister of Naval Service to have the appointment of superintendents of fish hatcheries and other important officers in the industry, whose duties called for technical training, taken out of the hands of political patronage boards and placed under the jurisdiction of the Civil Service Commission, received no encouragement until the Fish Commissioners of the Food Controller's office interested themselves in this question.

But about this time information was received, through a source that has always been interested in civil service reform, that the Government of the day was likely to change the status of the Civil Service Commission by removing the one man who had always set his face against political interference and stood out for efficiency in the appointments to the service under his control, and that if these changes were made it might not make much difference whether superintendents of fish hatcheries were appointed by the Civil Service Commission or, as they are now, by patronage boards.

Since that time Professor Short has been removed from the Chairmanship of the Civil Service Commission, and it remains to be seen if the predictions of our informant come true or not in the kind of appointments that will be made by the new Civil Service Commission.

We cannot help but voice a disappointment at the

silence of the press and the public when an efficient public servant can be so easily removed from so responsible a position without a protest.

There is no department of our public service which deserves the careful attention that the fish hatcheries of this country do. They are the only means of replenishing our fresh waters. Moreover, they are a most efficient means when under the superintendence of well-trained men. We have in Canada a number of most efficient hatchery superintendents, and I would not wish that any of my remarks should be taken as aspersions, on the good service they are giving, but the great majority of our hatchery superintendents are incompetent, and their work results more in destruction than in propagation. For instance, there is reason to believe that the millions of eggs which had been so carefully collected last year by the fishermen of Lake Erie were lost as a result of the incompetency of the men who had to do with the hatching of them. There are districts in which hatcheries have been misplaced, and there are districts which should be supplied with hatcheries before the waters are depleted. Undoubtedly there should be a hatchery on the banks of Lesser Slave Lake.

When the interests of our fisheries, the food requirements of the people or the national economy which increased production means, failed for so long to move the Government at Ottawa to investigate the fish resources of the Hudson Bay, one would have thought that the needs of the railway that is now being built to its shores would have demanded it, but not so. To date there is no information beyond what has been picked up by explorers and others equipped with the sportsman's fishing outfit. The principal value of so large a body of salt water must necessarily lie in the number and kinds of its deep sea fishes, the possibilities of which must be explored and investigated by experienced fishermen, with the aid of a trawler or other equipment used in the commercial fisheries.

I believe that the Canadian Fisheries Association is already beginning to move in this matter, and if nothing has been done by the Government before, to explore the fish resources of the Hudson Bay, James Bay and Hudson Strait, it is the intention to fit out an expedition under the direction of Captain F. W. Wallace, as soon as he can be spared from the work he is now doing for the Food Controller.

The constant irritation and uncertainty to which the fishing industry has been subjected by political interference is unbelievable. Let me give you an example. In 1915 an Order-in-Council was passed at Ottawa for the purpose of extending the bonding privileges to vessels landing less than carload lots of fish at Prince Rupert, thus giving smaller vessels the same privilege, as regards the United States markets, which the larger vessels enjoyed. In the preamble of this Order-in-Council it is stated that one of its purposes is to induce the transfer of tonnage from United States to Canadian registrar. The only consideration which could have suggested such a deliberate wording was the value which it might be to some politician. But look at the trouble it has caused the Canadian fishing industry. Shortly after this Order-in-Council was passed the fishing interests of the Pacific States began an agitation in Washington for a law "prohibiting the importation into the United States of fish caught in the North Pacific through any foreign country, unless in bond from a port of the United States or Alaska." Had such a law been enacted—and it came near enough

to send a shiver through the industry—a heavy loss and much mischief would have resulted.

Sixty per cent of the success of the above-mentioned agitation at Washington was due to the wording of the preamble of the above-mentioned Order-in-Council. Another thirty per cent. of the success was due to a ruling from Ottawa intending to increase the freight on the Grand Trunk Pacific Railway by forcing all the fish landed in bond at Prince Rupert over this route, thus depriving the markets of the Pacific States of such fish and making it difficult for the fishermen at Prince Rupert to dispose of such of their catch as would not stand the transcontinental haul.

You are all aware of the exceptionally small run of sockeye salmon there was in the Fraser River this year, due, it is authoritatively stated, to the obstructing of this River by rock cuttings made in the course of building the Canadian Northern Railway, which prevented the fish from getting to their spawning grounds four years ago. So small was the run this year that it did not pay to operate many of the canneries on this River. Thus, this piece of careless administration has resulted in the loss of much invested capital, injury to an important industry and the destruction of a valuable resource.

You will recall the petition which the C. F. A. forwarded early this year, begging the Minister of Naval Service to appoint a commission to investigate the conditions of the salmon industry of the Pacific Coast before putting into force the new regulations he proposed for 1918. These regulations were such a radical departure from those that have been in force since 1908 when the last Commission was appointed, that many of the older heads of the salmon canning industry were apprehensive of the outcome. But the Minister of Naval Service turned a deaf ear to the petition of the fishing industry and did not appoint a commission until urgent representations were made by the banking interests. This is an excellent illustration of the position in which the fishing industry of this country has ever found itself. It has been forced to work under conditions and regulations imposed by ill-informed and meddling politicians, unless it was able to enlist the support of some other outside influence.

With what indifference to the machinery of production and distribution has the Ontario Government entered upon the fishing of certain waters within the Province and the distribution of the fish therefrom at prices below what the private operative can produce and distribute them for and far below what they are costing the Province of Ontario to produce. How much better and more economical to the Province would it be for the Ontario Government to improve and strengthen the existing and experienced forces of production and distribution instead of weakening them by the creation of new machinery under the operation of inexperienced and hence expensive operators.

The business of catching fish by highly-paid politicians and distributing them from the Parliament Building, must necessarily be but a temporary performance, yet how much weaker will the ordinary machinery of production and distribution be as a result of this unfair competition after the war is over and when every piece of machinery for production and distribution will require to be in the strongest condition, in order to stand the strain of the load that will be put upon it and the competition it will have to meet.

A MESSAGE FROM THE FOOD CONTROLLER FOR CANADA TO BRITISH COLUMBIA FISHERMEN.

Greater production of our fisheries is absolutely essential to meet the needs of Canada and of the Empire. Canada must continue exporting meats and dairy products to the utmost limit. The only adequate reserve of flesh foods is in our fisheries. To organize for maximum production so that the depleted larders or our Allies may be supplied by our experts and so that Canada will be plentifully supplied, will require the united and unremitting efforts of everyone practically identified with the fishing industry.

Every additional pound produced beyond ordinary domestic requirements will release a corresponding amount of meat for those who are doing our fighting.

It is your duty and privilege to bring to this work the same spirit of patriotism that inspires your kinsmen and comrades at the Front.

Canada knows that your response to this appeal will be in keeping with the highest traditions of your calling. No more urgent imperial duty could be assigned you than helping to avert a calamitous shortage of food-supplies.

Do not waste good edible fish.

W. J. HANNA,
Food Controller for Canada.

LAKE FISH PRODUCERS MEET FOOD CONTROLLER.

Representatives of the Canadian fishing interests operating on the Western Canadian Lakes, were in conference on October 31 till November 2nd, with the Fish Committee of the Food Controller's Office, Ottawa. The object of the conference was to effect a solution of the export winter caught frozen fish trade and to ensure to Canadian consumers a sufficient supply of frozen lake fish at reasonable prices.

Strong representations have been made to the Food Controller, that the bulk of the winter caught fish of the Western Lakes have been going into the United States, and that the competition by irresponsible buyers and peddlers forced the price of the fish up to an unreasonable figure.

The result of the Conference, which was willingly assented to by all present, was that all Canadian fishermen, producers, distributors and retailers shall be licensed with the Food Controller; export trade to the United States would not be restricted, but a permit would be required for the purpose of export, and such permits would only be issued to regularly established dealers licensed with the Food Controller; the Canadian trade must have first call on the fish, and refusal to supply a legitimate order from a Canadian dealer in good financial standing, would result in the cancellation of license, and finally, a schedule of prices to be paid the fishermen of the Western Lakes for winter caught frozen fish was drawn up, and the price regulated through all channels from fisherman to consumer. This schedule is not yet complete, but we hope to have it for publication in the next issue of the Canadian Fisherman. The prices were drawn up subject to alteration whenever it was thought necessary, and applies only to winter caught fish on Lakes Winnipeg, Manitoba, Winnipegosis, The Pas and Big River District, Saskatchewan and Alberta Lakes.

Among the representatives of the Industry present were Walter S. Campbell, President Alberta Branch Canadian Fisheries Association; A. S. Duclos, Secretary, Alberta Branch, Canadian Fisheries Association;

THE B. C. COMMISSION ON DECK.



From Left to Right: F. T. James, H. E. Thompson
and W. S. Evans.

John Bowman, representing Head of Lakes Branch, Canadian Fisheries Association, Port Arthur, Ont.; Hon. Hugh Armstrong, C.F.A., Portage la Prairie; W. Douglas, Director for Manitoba, C.F.A.; J. Simpson, Director for Manitoba, C.F.A.; Capt. Wm. Robinson, C.F.A., Selkirk, Man.; A. S. Finlay, Secretary Lake Erie Branch, C.F.A.; P. W. Smithers, Booth Fisheries, Chicago; C. C. Robbins, Chicago; W. Crewe, C. Van Order, Lake Erie Branch, C.F.A.; F. T. James, C.F.A., Director for Ontario.



TO ALL WHOLESALERS OF FISH IN CANADA

Under the War Measures Act, all wholesalers of fish in Canada must register as such with the Food Controller's Office, Ottawa.

Failure to register renders the offender liable to a penalty not exceeding One Thousand Dollars, or to imprisonment for any period not exceeding three months, or both fine and imprisonment.

Those who have not already sent in their registration cards, must do so immediately. Wholesalers who have not received cards, can obtain same on application to the Food Controller's Office, Ottawa.

W. J. HANNA,

FOOD CONTROLLER.

OTTAWA, Nov. 1st, 1917.



HON. CHARLES COLQUHOUN BALLANTYNE.

BALLANTYNE, Hon. Charles Colquhoun, Minister of Marine and Fisheries; Vice-President and Managing Director, The Sherwin-Williams Company of Canada, Ltd., Manufacturers of Paints and Varnishes, 897 Centre Street, Montreal:

Director, Canada Cement Co., Ltd.;
 Director, Canadian Explosives, Ltd.;
 Director, Merchants Bank of Canada.

Born in Colquhoun, Ont., Aug. 9, 1867, son of John and Christina M. (Gordon) Ballantyne.

Educated in public school, Colquhoun and Montreal.

Began his business career with _____

Paint Manufacturers, Montreal, 1882; appointed Sales Manager, Sherwin-Williams' entire Canadian business, 1895; General Manager, 1898-1911; one of the pur-

chasers of that concern, 1911, becoming Vice-President and Managing Director.

President Montreal Branch, Canadian Manufacturers' Association, 1905-1906.

Member Montreal Board of Trade.

Member Chambre de Commerce, Montreal.

Harbour Commissioner, Montreal, 1907.

Life Governor Montreal General Hospital and Western Hospital, Montreal.

Married Ethel Trenholme, daughter of Thomas Trenholme, Montreal, 1901; has three sons.

Clubs: Mount Royal; St. James'; Forest and Stream; Montreal Jockey; Montreal Hunt; Canadian:

Politics: Conservative.

Creed:

Residence: 678 Mountain St., Montreal.



W. R. SPOONER
Chairman Transportation Committee; Director Canadian
Fisheries Association



W. H. BARKER

Vice-Chairman Canadian Fisheries Association 1915-16; Director Vancouver
Branch Canadian Fisheries Association



The Battle for the Fishes

III

By the HON. W. E. MEEHAN,

Former Fish Commissioner of the Commonwealth of Pennsylvania—Superintendent of the Fairmount Park, Philadelphia, Public Aquarium. Author of *Fish Culture in Ponds and Other Inland Waters*, etc.

Some years ago, an enterprising showman started an Aquarium on Broadway, New York City, as a commercial enterprise. He installed large tanks and pools with live fish and aquatic animals. The venture was a pronounced success for the public flocked to the place and paid for the privilege. It was so popular that a demand arose for a public free institution of the same kind, and New York City was induced to comply.

A building in the extreme lower end of the City, popularly known as Castle Garden was chosen for the new public institution. It was originally built for a fort in the latter part of the eighteenth century. Later

This caused a situation so serious that the friends of aquatic life took energetic measures to save the Aquarium from sinking to practical uselessness as an educational institution. They accomplished this by securing the passage of an act through the New York State Legislature to take the management of the Aquarium away from the City authorities and place it under that of the New York Zoological Society, a wealthy organization of public spirited men, that had already established a wonderful Zoological Garden in the Bronx.

The City was directed under the term of the act to supply the necessary ground and buildings, and to



New York Aquarium, Battery Park.

it was used as a Government immigration station but abandoned a short while before its location as an Aquarium for a new station on Ellis Island.

Its octagonal shape and massive low walls were admirably adapted and easily altered to the requirements of a public Aquarium. Unfortunately the dominating political element had no interest in the real advancement or extended usefulness of the institution; but regarded it as an adjunct to the party machinery. Efficient employes, even to the scientific and capable heads of the institution were removed to make room for incompetent henchmen, appointed as rewards for political services.

keep the latter in repair and when needed to enlarge them if financially possible. The employes from the Director to the door man and cleaners are all engaged by the authority of the Zoological Society and paid by that body. It also maintains the collections.

The Society put in charge one of the greatest experts in the country on fishery matters — a man formerly prominently connected with the United States Bureau of Fisheries, and he with an able corps of subordinates has brought the New York Aquarium up to such a high state of excellence that it is known throughout the United States and is almost as well known in Europe.

People elsewhere were quick to recognize the value of an Aquarium as an important medium of public education not only of the habits and characteristics of fishes in all parts of the world, but of their economic value as food products. The United States Bureau of Fisheries, out of its meagre appropriations, when the vastness of its work is taken into consideration, built a small but beautiful grotto Aquarium on the ground floor of its Administration Building in Washington and supplemented it by a nearly complete display of devices used in the fisheries of America and Europe.

Wherever there has been an international or national exposition of large proportions in the United States beginning with the international exposition in Chicago, aquaria by the national government or by states or by both have been among the most prominent and attractive features. The exhibits of live fishes by the United States Government and by Pennsylvania at Chicago in 1893 and in St. Louis in 1903 attracted the world's attention as did these of the national government at all subsequent world's fairs.

bined aquarium and distributing fish hatchery in the enterprising city of Montreal.

Detroit was the first of the cities in which an ambition to establish an aquarium was realized after the great institution in New York was in successful operation and the smaller one in Washington was opened to the public. Boston followed, Honolulu third and Philadelphia shortly after. San Francisco it is said, has its aquarium nearly completed. A small plant has also been built at the capital of Maine and there is a small but tasty sea water aquarium operated by a private corporation on one of the great amusement piers at Atlantic City, New Jersey. That city's public aquarium is still among the enterprises only projected. Chicago has made definite progress. The aquarium has been authorized, the location and scope decided on, the plans for the buildings nearly completed and the maintenance guaranteed by Mr. Cyrus Field, one of the wealthy and most progressive business men of that city.

The public exhibition of the New York aquarium is in one large octagonal room, and its more than



New York Aquarium—Main Floor View.

The movements in different cities, although diligently pushed, made slow progress, and in some they were periodic, as was the case in Philadelphia, where fifteen years elapsed before realization came. It was manifestly difficult to interest the municipal authorities to the point of definite action. There were nearly always some other public improvements under consideration which they deemed of more immediate interest to them than a display of fishes. It was easier to secure an appropriation for an apology for a zoological display in rude buildings located in some second class park.

Among the cities in which the movement for public aquaria were early begun were Philadelphia, Boston and Detroit. Later similar efforts were made in Chicago, Cleveland, San Francisco, Cincinnati, Honolulu, Baltimore, Pittsburg, Atlantic City and Augusta. This list will constantly be added to. There is talk for instance, that our Canadian friends are about to inaugurate a movement for the establishment of a com-

seventy-five tanks are arranged in two tiers, one on the main floor and the other on a projecting gallery above. The glass fronts are of a uniform height of three by one and one half feet. Until a few months ago there were nearly one hundred of these tanks with a depth back the same as the height. The majority were a little over three feet long, some were five feet and others seven. Recently all the tanks on the ground floor were enlarged by extending the backs to the outer wall of the building and removing the partitions dividing a number of them. While this reduced the number of tanks the swimming space was more than quadrupled.

Grouped around the floor of the exhibition room are seven large circular pools in which are displayed sea lions and other large aquatic animals including reptiles and huge fishes. Twenty-five smaller glass tanks grouped about these pools contain exhibitions of turtles, reptiles and amphibians. The apparatus for

hatching fish eggs is placed on the walls of the pools. The big tanks of one half the building hold fresh water fish and those on the other sea water life. Nearly 6000 specimens including almost 200 species are on exhibition of which more than 4000 are fish. Over the top of each tank are illuminated labels on which are set forth the scientific and common names of the fishes exhibited; their habitat and range, and a short account of their economic value and any peculiarities they may possess. This illuminated label system is as a matter of course to be found in all the public aquaria in the United States.

Behind the scenes or back of the tanks and in rooms where the public may not penetrate are the vitals of the institution; the heart, the lungs, the veins, the force that maintains the being of the aquarium — on which depends the healthful existence of the fish and other aquatic life in confinement.



Detroit Aquarium.

Few of the thousands who visit the New York and similar aquaria in other parts of the country have the slightest conception of the varied and intricate machinery and the human skill required to successfully operate them. The vast majority while enjoying and being educated in the habits and value of fishes are ignorant of the fact that there is something more to be done than to build tanks, arrange them artistically, fill them with water, introduce the fish, feed them regularly and then stand aside for the public to enjoy. They would be astonished to know that, to maintain the exhibit in the highest state or efficiency, to keep the death rate to low proportions, human eyes must be open twenty-four hours in the day; human brains and hands ceaselessly at work; engines, pumps and other machinery operate from one year's end to another without stoppage, and that sick fish are taken from exhibition, placed in a hospital built especially for them, nursed as carefully, and given medicine and medical treatment the same as sick humans. Some would be even more astonished if by chance they peeped into the pharmacy to find among the various medicines for sick fishes, such familiar remedies as castor oil, epsom salts, phenol sodique, Talkington's balsam, common salt, iodine, and turpentine.

The engine room of a complete aquarium has all machinery in duplicate, so that in case of a break down in one set, the other may be put immediately in operation to keep the heart of the institution going, and also that one set may have periodical rest, for machinery to be long effective must not continually labor.

In the engine room of the New York aquarium are pumps for pumping warm and cold sea water and for refrigerated fresh water to big overhead tanks, from which it drops by gravity to the exhibition and stock tanks. There are pumps to compress air and drive the life sustaining oxygen to the fish. There is a large machine for chilling thousands of gallons of sea and fresh water for the maintenance of the lives of both fresh and ocean fishes that cannot dwell in a water temperature of much over 60 degrees F.

Everywhere excepting perhaps on the ceilings is a seeming maze of pipes of different sizes and many colors. Some are for the conveyance of normal temperatured fresh water, some for sea water of a uniform temperature of 70 degrees, and some for refrigerated sea water. Others are for compressed air, electric light wires and for gas. Others again, and these are either on the ground, under the flooring, or back or under the tanks, are for conveying the water after it has flowed from the tanks, either to the sewer or to the filters to be cleaned, aerated and used over again, or perhaps to the great sea water storage tanks outside the building where the reserve sea water is kept.

Perhaps the sea water itself, that is used for the ocean fishes, is an object of interest to a large proportion of the public only second to that of the fishes themselves. Everyone who visits the New York aquarium knows or takes it for granted that the salt water used in that institution is the genuine article; but more than seventy-five per cent are convinced or believe that it is pumped directly from the New York Bay just beyond the walls of the building. Hundreds who have visited both it and the Philadelphia institution have expressed regrets to the superintendent that the latter did not have the same advantage as the former of having a bay of salt water close at hand and was therefore either forced to convey it nearly a hundred miles or as some supposed actually manufacture sea water. The astonishment of most of these sympathizers is almost ludicrous when informed that



Detroit Aquarium—Interior.

the New York Bay water is not used for the sea fish on account of its low salinity and strong pollution, but brought from the blue ocean beyond Sandy Hook, nearly as great a distance as for the Philadelphia aquarium. That the Bay water is only used for the aquatic animals in the big pools and then only after being thoroughly filtered.

Sea water in all public aquaria is used over and over again by what is termed a closed circulation system.

When clear and blue and pure and of a specific gravity of at least 1.023, it is brought by water boats or lighters, thousands of gallons at a time, the sea water is emptied into huge storage vats, where it is kept shaded but air allowed to circulate over it. There it is kept until needed. New York requires more than 300,000 gallons for its work. Philadelphia at present about 100,000 and Detroit and Boston each about the same amount.

After the exhibition, stock, gravity tank and filter pool are filled, the water is set in motion. It flows from the gravity tank to the exhibition and stock tanks and from thence by overflows and drains to a filter where it drops in a fine shoot or spray to a sand bed through which it passes and is cleaned, into a collect-



HON. WILLIAM E. MEEHAN, Superintendent.
Philadelphia Aquarium, Fairmount Park.

ing pipe and from thence into the filter pool. From there it is pumped back to the gravity tank, and used over again.

Thoroughly aerated water is a necessity for the existence of fish and this is provided for in the circulation of sea water. While making its round it receives an aeration no less than four times without including compressed or sucked air. The first of this oxygenation is when the water plunges from the inflow pipes into the exhibition tanks; the second when it flows from the drainage pipe into the filter; the third is when it drops from the collecting pipe into the filter pool and the fourth when after being pumped it empties into the gravity tank.

All the public aquaria in the United States, with the exception of Boston, have to pay for the sea water they use, and considering the quantity of it in the world, pay heavily. Consequently the head of each institution guards his supply carefully as something precious, and loss from leakage or other causes cause him more anxiety than almost any other misadventure in the institution. Cracking of pipes or other forms of leaks, the sudden breakage of a pane of glass may cause a serious loss of water in a short time. A broken pane of glass in the Philadelphia aquarium one night, and aquarium glass has an exasperating habit of breaking at night only, when there is a minimum of employes, resulted in a wastage of over 6000 gallons of sea water in less than five minutes. An unexplained cracking of a pipe underground caused the loss of nearly 20,000 gallons before the leak was located and repaired.

There is naturally an unavoidable loss of sea water through evaporation, and that loss is heavier than would generally be thought, because no matter how cold the weather may be the water temperature must be maintained at about 70 degrees and that means heated for more than half the year and constant evaporation. Fortunately evaporation does not take all the chemicals that make perfect sea water, hence most of the loss can be replaced by the introduction of fresh water. This however cannot be done continuously, because some of the chemicals do disappear. To overcome this it is the practice of the Philadelphia aquarium to occasionally add to the natural water in actual use a few thousand gallons of artificial sea water. This is made by mixing 26.9 parts of sodium chloride; 3.2 parts of magnesium chloride; 2.2 parts of magnesium sulphate; 1.4 parts of calcium sulphate; .6 parts of potassium chloride; .06 parts of sodium bromide; .01 parts of potassium sulphate and 965.6 of pure water or sand-filtered water.

Artificial sea water in itself is not very satisfactory for aquarium purposes. It contains the same chemicals and in the same proportions as true sea water, and has the same specific gravity; but it deteriorates rapidly, and unless replaced in a short time by an entirely new batch, the fish begin to exhibit a lower standard of health. When mixed with sea water however, there is not only no deterioration but apparently the true sea water is improved.

Leakage is not the only danger to be avoided and provided against. The character of the pipe through which the sea water must pass to and from the tanks must be very seriously considered. Iron cannot be used for various reasons, one because it corrodes rapidly and goes to pieces under the action of salt water and another is that the corrosion tints the sea water a reddish color. This is not necessarily harmful to the fish, but pellucid water is desirable for the most attractive display. New York uses hard rubber, the best piping known and although very expensive, when once installed is virtually indestructible and never gives any trouble. Boston uses lead lined iron pipes but it is unsatisfactory, because it is apt to contain many pin holes, often not detectable until some time after being in operation. The pin holes allow corrosion of the iron and leaks become frequent. Lead lined pipe was used some years ago in the New York aquarium, but was discarded. Philadelphia experimented with wooden pipe and still uses it; but while in many particulars it meets the requirements for conveying sea water, it is apt to crack and leak and

there is liability of sap wood which also results in the loss of water.

Boston's aquarium completed and opened to the public in 1911 is well located in Marine Park on the shores of Massachusetts Bay. The building was erected for aquarium purposes and when completed cost in the neighborhood of \$150,000. It is in the form of a Greek cross and contains between 40 and 50 exhibition tanks, and one large circular seal pool. The tanks differ materially from most of those in use in Battery Park. The majority of the latter are built of brick or concrete and each is a separate and distinct tank. Those in Boston are constructed of wood and are built in series, each divided into separate tanks by sheets of unground plate glass extending to within a couple of inches of the bottom. The divisions are all about three feet apart and the glass frontage is over five and one

of the waters of Massachusetts Bay is sufficient and pollution is a minimum.

Detroit's aquarium located on Belle Isle, Lake Erie, Detroit's leading pleasure ground, was erected and opened to the public in 1904. The cost and equipment of the structure was \$114,000. The annual operating expenses are about \$12,000 a year. Along each side of the room which, like the Boston institution was erected for aquarium purposes, are 52 exhibition tanks, 30 for fresh and 22 for sea water fishes. The average number of species displayed is about 75. The original supply of sea water was received from Buzzards Bay, Mass., and the Director of the institution prides himself on the fact that it has been so carefully conserved, it has not been necessary in the succeeding years to purchase another supply. The water used for transporting fish annually from the sea coast is said to be



Philadelphia Aquarium, Fairmount Park—Grounds and Buildings on the Banks of the Schuylkill River.

half feet high giving the deepest tanks of any aquarium in the country.

One drawback to the system in Boston is that if a pane of glass breaks or if for any reason it is desired to run off the water from one tank in the section, all the water in the entire section must also be drawn. On the other hand when the section is filled with water the unground glass seems to shade into the surrounding water and the effect is of one long unbroken body of water.

The engine, machinery and most of the necessary work rooms are in the basement, and form one of the most complete and spacious sections of all the American aquaria. Unlike New York, Boston uses bay water when a new supply is necessary. The salinity

sufficient with occasional injection of fresh water to replace the loss by evaporation.

Those to whom was intrusted the task of building the Philadelphia aquarium had the benefit of the experience of the existing institution in addition to those they themselves possessed. As a result in most features it is the most nearly up to date plant of the kind in the country. It was created by an ordinance of City Councils of the City of Philadelphia, March 1911, and its construction and operation placed in the hands of the Commissioners of Fairmount Park, the City's huge and rarely beautiful pleasure grounds.

In the lower part of Fairmount Park near one of the entrances is a strip of ground bounded on one side by the picturesque Schuylkill River and on the other by

a high precipitous rock faced hill, which gives the name to the city's recreation ground. It is occupied by a group of buildings said to be among the finest examples of the Grecian style of architecture in the United States. Built in the early days of the last century they were, for many years, the finest and among the best known water works in the world. Until shortly before the civil war they supplied a large portion of Philadelphia with its water for domestic purposes.

A few years ago, on the introduction of filtration, they became both inadequate to meet the modern requirements and were abandoned for larger and more up to date plants.

The buildings were pronounced admirably adapted with few interior changes, to the requirements of a huge aquarium and it was decided to utilize them instead of erecting new structures. There were two pump rooms, one 200 and the other 100 feet long and from 50 to 70 feet wide. These were set aside to be remodeled for the display of fishes, the smaller for tropical sea water types exclusively and the larger for temperate sea water and fresh water fishes.

The roofs of the two pump rooms are flat and on a level with the grounds at one end and one side, and constitute a spacious plaza, with the river on one side



Philadelphia Aquarium from the Schuylkill River.

and a long narrow pool formerly used as a forebay and spanned by an artistic stone bridge on the other. On the plaza stands the replica of an ancient open Grecian temple and several small buildings. At the lower end is a large edifice of Colonial style architecture. One of the smaller buildings was set apart for an administration office, one for a fish egg hatching house and the others for work shops. The first floor of the mansion it was decided to utilize as a hall for public free lectures and motion picture exhibitions on aquatic subjects, and other rooms as toilets and rest rooms for men and women.

In order that the public might have something to enjoy while the pump and other rooms were being remodeled and equipped, a temporary fresh water aquarium was installed in the big lecture room in the mansion. This was installed in three weeks and was in operation four years. Crude as it was, the temporary exhibit attained instant popularity and was visited by thousands annually.

On the fifteenth of June 1915, the smaller of the two pump rooms was completely equipped, stocked with sea and fresh water fish and opened to the public. The larger pump room was about half completed when available funds were exhausted and no work has been

done on it since, although it is expected to be resumed the beginning of the coming year.

The great exhibition tanks are built of reinforced concrete, lined with asphalt to make them perfectly water tight. The glass height is five feet and the length seven, with the exception of one that is twelve feet long and six feet high. Twenty four out of the twenty-five hold each 1350 gallons of water and the large one a little less than 3000. Arranged down the centre of the room, in place of pools there are eight, all glass tanks, each five feet long and two and one half feet high, and the plumbing work has been so arranged that the ebb and flow of the tides can be fairly well simulated. The large tanks are built somewhat after the Boston system, that is to say in sections; but there the similarity ends, for the divisions making the seven foot tanks are mostly of slate and water tight, so that each can be emptied of water without disturbing the others.

Glass for the front of an exhibition tank is one of the most important problems to be solved. It is also one of the most troublesome. It is an untrustworthy substance to deal with. No aquarist can feel perfectly sure from day to day that a pane of glass, however thick, will not crack. Irregular temperatured air currents or half a dozen agencies other than water pressure may cause the disaster. Water pressure is easy to figure on. It is only a question of multiplication of known figures. Glass one inch thick will resist water pressure in a tank three or three and one half feet deep. Glass seven eighths inches thick held in tanks three feet deep at the Pennsylvania State Fisheries exhibit at the St. Louis Worlds Fair Boston's five and one half feet tanks are fronted with glass one and one quarter inches thick, and half that in the Philadelphia aquarium is the same, and holds as firmly as the other half of one and one half inches, put in because the lighter weight could not be procured.

While one inch glass is undoubtedly thick enough to resist a water pressure in a tank three and one half feet deep, and one and one quarter a tank of five or six feet deep, there is not an aquarist, after so expressing himself but will add "but better use a pane of glass a quarter of an inch thicker."

All the machinery and appliances used in other public Aquaria are in place in the Philadelphia institution although some of the appliances are so arranged as to give greater effectiveness.

Nowadays it is not considered sufficient to provide a plain tank, fill it with suitable water and give the fish their required amount of oxygen and food. The tanks must be artistically fitted up. In this particular all the institutions differ according to the ideas of the heads. All however use rackwork and some employ in addition submerged logs and others replicas of subaqueous coral scenes at the back of the tanks and protected from the water by heavy plate glass. The rackwork at the Philadelphia aquarium is calcareous tufa, a porous fossiliferous coral like rock found in Ohio. It is highly artistic and is easily arranged. For still greater effect, water plants are encouraged to grow among these submerged stones.

The cost of the one room of the Philadelphia aquarium together with the other rooms remodeled was approximately \$100,000. Had less substantial material been used, the cost of the remodeling would probably not have exceeded half that amount. There is exhib-

ited about 1000 fish, including some 75 species, in the 33 exhibition tanks, and about forty species of aquatic reptiles other than snakes.

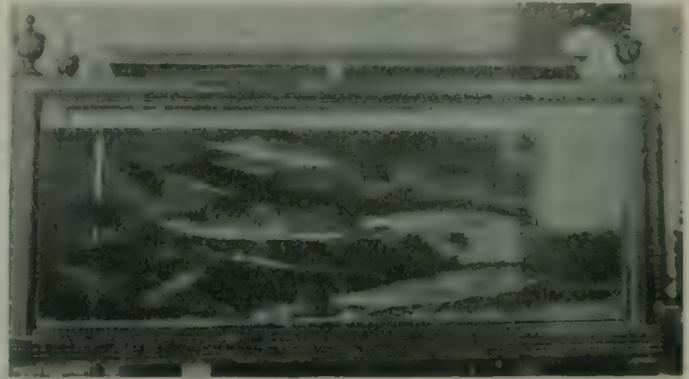
As Pennsylvania is one of the States that leads in fish culture, and as it was in Pennsylvania that almost if not the first battle for the fishes was begun, and as it is in Pennsylvania that the greatest progress has been made towards the repopulation of the waters, it was deemed appropriate that the propagation of fishes be made a conspicuous feature of the Philadelphia aquarium. A separate, though small building on the plaza was set aside for this purpose and added to by a glass house. In the room was built four hatching and rearing troughs for trout and other cold water fish. Against the wall was built a fish hatching battery for the incubation of eggs of such fishes as shad, white fish, yellow perch and pike-perch. In the glass house a concrete tank and shelves. This exhibit draws as many people almost as the one of live fishes. The success of this feature of the aquarium is an unanswerable argument in favor, wherever possible, of adding a fish cultural establishment on a large scale to any public aquarium that may hereafter be designed.

The plant in the Philadelphia aquarium is too small to be of any material assistance in stocking streams and other waters, but one on the same scale as an aquarium proper would, and besides be of incalculable benefit as an educator of the public.

Attendance is the best evidence of popularity, and with this as a basis for judgment, a public aquarium is the most popular institution that a city can establish. The New York aquarium is visited annually by more than 1,500,000 people and the number has exceeded 2,000,000, said to be the greatest attendance of any one institution in the world. About 1,000,000 go through the Detroit aquarium annually, and the same number visit the institution in Boston, and neither are what the world calls large cities. Over half

a million visit the new unfinished and unadvertised Philadelphia plant.

Another evidence of popularity almost equally strong is repeated visits by individuals. The testimony of the heads of all the established public aquaria is that, with the possible exception of cosmopolitan New York with its vast floating population, at least one half of the annual attendance are repeated visits. In every institution of this kind there is an astonishingly large number of people whose faces become familiar to the attendants, and at no time can an attache stroll among the visitors without hearing remarks from some showing that they had been there before.



Philadelphia Aquarium—Pickerel Tank.

On one Sunday an attendant at the Philadelphia aquarium was directed to make a careful note of every person he heard give utterance to any remark that would indicate a familiarity with the place, or whom he had himself seen before, and at the end of the day of 4733 persons recorded as present, he found 2817 who had been in the place before.

By the establishment and operation of the New York, Boston, Philadelphia and the Washington aquaria, more than 6,000,000 people are being directly educated in the habits and characteristics of living fish, both sea and fresh water, from different parts of the world, and education that cannot be imparted in any other way. It is giving a tremendous impetus to the cause of fish conservation.

A study of the life habits of fish when in their natural environments, can only be made on very narrow lines, both unsatisfactory and usually with extreme difficulty. Little more than glimpses can be had of fish when swimming in the free water. Through the aquarium, especially where effort is made to arrange the tanks so as to imitate as nearly as possible the natural surroundings, and also to arrange the fish themselves in family groups, the curious not to say wonderful habits of fishes are laid bare to human eyes.

Until the opening of buildings for the display of living fishes, few excepting scientific men, and many of those only through the imperfect observations of others, know that most fishes have the power and exercise it of changing the color of their bodies under the stress of excitement, anger, fear, courtship and as a protection against enemies. Further, that for each sensation there is a distinct difference in color and shade, and that in some instances the change is made with great rapidity.

The public is learning by direct observation the characteristic traits of fishes — very human some of them are although emphatically of the earliest time of



Philadelphia Aquarium—Exhibition Room, Marino Hall.

primeval man — Conspicuously predominating are unbounded selfishness and greed, unbridled brutality by all that have the strength to exercise it and self sacrifice absent, excepting by parents to a limited extent.

The field of education is broadened in New York and Philadelphia by the facilities offered and taken advantage of by the school authorities. Children are sent to the two institutions in school hours and in Philadelphia given brief lessons in the form of simple lectures on the habits and values of fishes, and in New York there are rooms properly equipped where school teachers can pursue studies in aquatic biology.

CANADA'S FISHERIES OCCUPY SECOND PLACE IN COUNTRY'S TRADE.

Thirteen Million of Dollars Brought in From the Sea by the Fishermen of the Maritime Provinces Each Year.—Unlimited Possibilities.



THE fisheries are worth \$13,000,000 to \$15,000,000 annually to the three Maritime Provinces. Nova Scotia's fishery production every year is worth from \$7,000,000 to \$10,000,000, and the New Brunswick fisheries yield approximately \$4,000,000 annually. The Prince Edward Island fisheries always add from \$1,000,000 to \$1,250,000 to the wealth of that province.

The fisheries of the Maritime Provinces average from one-third to one-half of the total fishery output of Canada, being equalled only by the provinces of British Columbia. The inland provinces produce a considerable quantity of fresh water fish, which help to swell the total values of the Canadian fishing industries.

The fisheries of Canada employ about 98,600 men, of which over 86,000 are employed in the sea fisheries and the balance in the inland fisheries. The boats, traps and other equipment used in the sea fisheries of the Dominion are worth approximately \$25,000,000, about equally divided between the Maritime Provinces and British Columbia. At the last published census (1913) the lobster traps in the Maritime Provinces numbered 1,617,195, and the lobster canneries numbered 722. The traps had a value of nearly \$1,500,000.

The lobster industry is one of the biggest departments of the Nova Scotia fisheries, this with finnan haddies, halibut and mackerel, making up the chief products of the Maritime fishing industries. Fish canneries are numerous in Nova Scotia and New Brunswick, their products being shipped to all parts of the world. They give employment to a large number of hands during the canning seasons and are among the biggest industrial enterprises of these provinces.

In 1913 there were over 18,000 men in the Maritime Provinces receiving shipping bounties, and of these 2,328 were in Prince Edward Island, 14,300 in Nova Scotia, and 2,225 in New Brunswick. The bounties paid in this year totalled \$11,082 in Prince Edward Island, \$93,456 in Nova Scotia, and \$16,385 in New Brunswick. The total bounties paid in Canada in the year under review amounted to \$158,661, Quebec coming in for \$37,738 paid to over 8,000 men.

It is no exaggeration to state that Canada possesses the most extensive fisheries in the world. Abundant supplies of all the principal commercial food fish, including lobsters, herring, mackerel, sardines, haddock, cod, hake and pollock are caught in Canadian territorial water, especially along the Atlantic coast, while British Columbia supplies a big percentage of the salmon catch of the continent. The coast line of the Atlantic provinces from the Bay of Fundy to the Straits of Belle Isle, without taking into account the lesser bays and indentations, measures over 5,000 miles; and along this great stretch are to be found innumerable natural harbors and coves, in many of which valuable fish are taken in considerable quantities with little effort.

On the Atlantic coast—in the Maritime Provinces—the fisheries may be divided into two distinct classes; the deep-sea and the inshore or coastal fisheries. The deep-sea fishery is pursued in vessels of from 40 to 100 tons, carrying crews of from 12 to 20 men. The fishing grounds worked are on the several banks, which lie from 20 to 90 miles off the Canadian coast. The style of fishing is that of "trawling" by hook-and-line. The bait used is chiefly herring, squid and capelin; and the fish taken are principally cod, haddock, hake, pollock and halibut.

The inshore or coastal fishery is carried on in small boats with crews of from two to three men; also in a class of small vessels with crews of from four to seven men. The means of capture employed by boat fishermen are gill-nets, hooks and lines, both hand-line and trawl; and from the shore are operated trap-nets, haul-seines and weirs. The commercial food fishes taken inshore are the cod, hake, haddock, pollock, halibut, herring, mackerel, alewife, shad, smelt, flounder and sardine.

The Lobster Fishing.

The most extensive lobster fishery known is carried on along the whole of the eastern shore of Canada whilst excellent oyster beds exist in many parts of the Gulf of St. Lawrence, notably on the north coast of Prince Edward Island and in the Northumberland Strait. The most extensive canneries of the Maritime Province include the lobster, sardine and finnan haddie industries. New Brunswick is noted chiefly for its sardine canneries, while Nova Scotia has some of the biggest lobster and finnan haddie canneries.

Shows Big Increase.

While most of the fresh fish of the Maritime Provinces is sold to New England buyers, the trade in cannery products with every part of the Dominion has shown big increases in recent years.

ANCIENT COLONY SHORT OF SALT.

Government commandeers all available stocks of salt —Will be distributed among fishermen.

A serious shortage in salt is causing much inconvenience to the fisheries interests in Newfoundland. Arrangements made some time ago to provide for the needs of the present year have proved inadequate. The Government has now commandeered all available stocks of salt in the Colony and arranged for their distribution among the fishermen to the fullest extent possible, until additional supplies can be obtained from abroad. Two ships laden with this commodity and bound for this port were torpedoed.

Ten Reasons Why Canada's Fish are a First Food Resource

By PROF. EDWARD E. PRINCE, LL.D., M.A., D.Sc.,
F.R.S.C., Commissioner of Fisheries for
Canada, Ottawa.

In spite of much talk about Food Conservation, it is a remarkable fact that the most important of our natural food resources has been largely forgotten by the authorities, and almost ignored by the general public.

Most people are alarmed at the shortage of potatoes, or beef, or pork, or fruit, or eggs, but what about fish? It should be pointed out that in the Food Bill prepared by the Committee on War in the New York Legislature, no mention whatever is made of fish, while in the United States Council of Natural Defence, every industry is represented except the fresh fish industry, and some of our own Commissions in Canada have apparently forgotten that our fish and fisheries rank amongst the most important in the world.

Canada's fish and fisheries are entitled to a first place amongst food resources. Fortunately there are far-seeing men amongst us who have realized that fish rank amongst the most delicious and most nutritious foods. In public addresses some prominent Canadians have lately called attention to these important facts, but, speaking generally, it has not been realized that the Canadian people have a supply of the best kind of food in the shape of fish, and that in every part of the Dominion there is a supply which is practically inexhaustible.

There are ten reasons why our fish and fisheries rank amongst our greatest Natural Resources.

1. Fish are unexcelled as food because:

(a) They are rich in proteins, which build up the tissues of the human body, and supply energy for warmth and muscular exertion and activity.

(b) They are more digestible than meat or vegetables, and contain little fat or waste material. Fish digests in 1½ to 2½ hours, but beef takes 3 to 4 hours, and pork as much as 5 hours.

Doctor Langworthy, a United States' expert recently stated that cod-fish steak, for the same cost, provides more than twice the proteins and 2-3 of the energy which sirloin beefsteak furnishes.

2. Fish are more universally distributed than any other food resource.

Canada has waters everywhere, great oceans on her east, west, and north boundaries, and there are lakes and rivers spread like a net all over her vast territories. There are local fruit areas, great wheat fields and grazing lands here and there, but wherever there are waters in the Dominion there are fish, east, west, north and south.

3. Fish produce more human food per acre than land crops yield.

"But once in the year," said the British Fisheries Commission, 1863, "an acre of good land carefully tilled produces a ton of wheat or 203 cwts. of meat. The same area on the bottom of the sea, on the best fishing grounds, yields a greater amount of food to the persevering fisherman every week in the year." The waters in the opinion of the best authorities are far

more productive of food than the land.

4. Fish produce a harvest self-tilled, self-seeded, self-matured; they require only to be harvested and marketed; but the land requires to be properly ploughed, seeded, and tilled, with great labor and expense, before the crop is produced. Without labor, expense, and care, the fish harvest ripens ready for the fisherman to gather, and the public to enjoy.

5. Fish are food practically ready for use.

No factories or manufacturing equipments, abattoirs, or other establishments, are necessary to make the production of the waters ready for the kitchen. Some races, like the Eskimo, and many European nations, eat fish just as they are brought from the water, and in the case of even the most fastidious peoples, the cleaning and cooking of fish is one of the simplest of domestic tasks.

Fish are not only the lightest and most digestible of foods, but they are the most available.

6. The fish harvest is most reliable, in spite of fluctuations and hindrances, which are commonly called "Fishermen's luck."

The fish harvest is safe from the danger of such calamities as destructive storms, cyclones, earthquakes, volcanic eruptions, etc., which frequently make a wilderness where smiling fields, forests, and vineyards formerly thrived.

Local destruction of fish occurs, no doubt, owing to storms, pollutions, etc., but such loss is very slight, and in a season or two entirely repaired.

7. The fisheries persist in spite of war and criminal destruction associated with war methods.

The first aim of an enemy is to destroy its opponent's food supply. Ranches and fields and forests are, therefore, burned, but the fish in the seas and lakes and rivers still continue unharmed, prolific, and abundant. Submarines, etc., may destroy a certain amount of fish, but the supply on the whole is little affected.

8. Fish cannot be completely depleted or destroyed by natural or human causes; but may be relied upon to furnish a permanent supply of food.

Eminent authorities like Professor Huxley and Professor McIntosh claim that our best food fish cannot be completely exterminated. The late Professor Hind estimated, for example, that our Atlantic cod banks had furnished no less than 150 to 175 millions of cod-fish to the bank fishermen during the last half century, though they have been fished for six hundred years. This is probably much under estimated, and the production of fish having been taken from the waters, the "Banks" still remain the most productive in existence.

9. Fish are a cheap food, or should be.

Nature produces the harvest, though the cost of the harvesting may increase. The cost of labor, of boats, of nets and fishing apparatus, may rise, but the first cost is the same. In other words the water produces fish without labor or care on man's part, and

very seriously affect the cost of fish, and if they do, any increase in price is, therefore, due to the conditions of catching or marketing, and these should not very seriously affect the cost of fish, and if they do, artificial trade causes are at work, and these can be remedied, and in time of war should be promptly and effectively investigated.

10. Fish are a welcome and palatable food.

Many people dislike pork or veal. Some dislike potatoes, and others will not accept oat meal porridge; but the palate must be depraved, and the digestive organs very abnormal, will find fish undesirable and indigestible. Such degenerate natures are rare. What is more appetizing than cod-steak with oysters, and haddock with anchovy sauce, or a trout or salmon-steak with lemon; or a boiled lobster. To most people these form a most delightful and welcome food on the daily bill of fare.

The above ten reasons prove the value of fish and fisheries as a source of cheap, nutritious and reliable food for our people, and they are summarized as follows:

1. Fish are the best of foods.
2. They are more universally distributed.
3. They are more productive than other food materials.
4. They are produced at less cost.
5. They are ready for use without any manufacturing process.
6. They are not affected by calamities, storms, etc.
7. They are immune from the destructive methods of warfare.
8. They are practically inexhaustible.
9. They are an economical food.
10. They are welcome and delicious on the table.

The Municipalities of Canada and the Fisheries

FREDERICK W. WALLACE.

(From "The Canadian Municipal Journal,"
May, 1917.)

In the following article Mr. F. W. Wallace points out one of the shortcomings of our municipal administration, namely, the almost contemptible indifference of many local authorities to public markets, the control being left too often in the hands of superintendents who are incapable of understanding that cleanliness is very necessary to our present standards of living. In every public market there should be one part allotted entirely for the display of fish. This part, or separate wing if necessary, should be kept so clean as to create a demand for fish, and thus encourage one of the great industries particularly indigenous to the waters of Canada, but which up to now has had to find foreign markets for the larger part of the output. There is no doubt but what municipal authorities in Canada can do much, by the building of up-to-date fish markets, to encourage the people to eat one of the most palatable and nourishing of foods, besides being one of the cheapest, and thus help to keep down the cost of foodstuffs in their respective communities.

Canada possesses in her rivers and lakes, and in the territorial waters of, and adjacent to, her Atlantic and Pacific coasts, the most abundant and prolific fisheries in the world. There is no limit to their development, but so far, Canadians have allowed most of our fishery wealth — that immediately outside our territorial jurisdiction but adjacent to our own ports — to be exploited by the fishermen of other nations — notably American and French.

The greater part of the catch of our own fishermen — amounting in value to a total of \$34,000,000 annually — is not consumed in Canada, but is exported to other countries. Practically all the salt codfish caught by Canadian fishermen on the Atlantic is exported to Europe, the West Indies and South America; the bulk of our lobsters go to the United States or to Europe; our Pacific halibut to the United States takes a great proportion of the fresh fish caught on the lakes and rivers. Since the war started, enormous quantities of Canadian fish have been exported to the Allied

countries to make up for the shortage in their own home waters.

Huge quantities of the fish foods caught by United States fishermen are taken from the "grounds" and "banks" outside the three-mile-limit of the Canadian Pacific and Atlantic coasts. Prior to the war, the French Grand Bank fleet, coming from France and operating from St. Pierre and Miquelon, reaped a big harvest from the fishing grounds adjacent to Canada and Newfoundland.

There can be no legal objection to this. The seas are free to all men outside territorial jurisdiction, but it shows that Canadians are not utilizing for themselves the valuable sea foods procurable at their own doors. Why should the bulk of our fish products be exported? Why aren't the fishing grounds being developed more by Canadian fishermen?

There are two answers to these questions. First — the population of Canada is not large enough to constitute a market capable of consuming the present catch. Second — the present population does not appreciate the value and economy of fish as a food. Canadians are not fish-eaters.

If the home market developed to the extent it should be on a par with the fish consuming public of Great Britain and Europe; if Canadians would eat more fish and less meat, there would be a vast increase in the market for the products of our fishermen and more fishermen and more vessels would go into the industry.

The export trade is largely a canned and cured fish trade. Capital is tied up in the product until such time as it is marketed. The home market is for fresh fish. Such fish is consumed shortly after the fish leaves the water. In the export trade, capital is turned over, say, in six weeks; in the fresh fish home trade, it is turned over inside of two weeks.

The home market means a quick turn-over of capital; it keeps the money in the country; Canadians are utilizing as food one of our natural resources; they are keeping down the cost of living; they are assisting to

develop the fishing grounds which are primarily ours by virtue of their location to our shores, and, last, but not least, they are encouraging shipbuilding for the fishing fleets and the industries in its train, and training young Canadians in a sea-faring vocation which in Great Britain to-day has proved to be the salvation of the Empire. If the spirit of sea-faring had been allowed to die in Great Britain, the mastery of the sea would be in Germany's hands now.

The cradle of the British Navy and the British Mercantile Marine is the British Fishing Fleet. The fish eating population of Great Britain has kept the fishing fleets alive. There is no gainsaying that fact.

Every Canadian citizen, who is worthy of citizenship and who is proud of his or her citizenship would do well to look into their duties as citizens. Upon the citizen depends the State. It can either flourish or become decadent by the varying moods of public spirit. When the citizens of Rome began to fail in their duties as citizens, then Rome fell. When the aristocracy of France began to over-ride the citizens, then the Monarchy was wiped out, and the aristocracy went with it.

Encourage home industries! is a war-time slogan which should live. The fisheries, of all Canada's national industries, has been the most neglected by her citizens.

How can the municipality do its duty to the fisheries? Very easily.

Every town has a public market, if it hasn't, it should have. In most Canadian towns, the public market relegates the poorest and dingiest corner in the building to the local fish merchant. He is regarded by the grocer and the butcher as being a sort of peddler to be poked into obscurity. If there is no local dealer handling fish exclusively, the butcher will carry fish of certain kinds as a Friday side-line for the religious prescriptions of his customers.

This sort of thing should be done away with. The fish stall in a small public market should be a good stand. It should be properly equipped with tiled walls, cement or tiled floors, slab counters, cooled glass showcases, and refrigerator chambers for storing. In large cities, a market devoted exclusively to fish should be erected.

Were these facilities given by the municipality, there would be no lack of responsible men to occupy the stalls. With first class equipment, fish could be attractively displayed and would appeal to the consumer. The occupant of the fish stall would soon work up a trade. Give him a good stall and he'll do the rest.

In the city of Montreal, the local public fish markets are housed in wretched buildings—antiquated, out-of-date, and anything but attractive. The merchants who occupy them would welcome a change. They have fought for modern markets for years, but cannot get them. They have to do the best they can in the places that are given to them by the city. The same applies to other towns and cities throughout Canada. Fish markets are either neglected or conspicuous by their absence.

This matter is of the utmost importance. It is a really great problem, and one which should be taken up by every municipal council throughout the Dominion. We have overlooked many such problems in the past, and it is only in a time of stress like the present that we begin to realize the big things we have neglected.

The public fish market, properly equipped and run by a man who knows his business, will encourage the citizens to eat more fish and reduce living costs; assist in developing among ourselves a great natural resource, and encourage men to pursue a seafaring vocation, which from time immemorial, has been the strength of the British Empire.

Qualifications of Seamen

In course of time, following procedure in other countries, the Canadian Government will no doubt require all skippers and second-hands of off-shore fishing vessels, to take out certificates of competency. It does not necessarily follow that such a requirement will produce a more efficient type of fishermen; about the first time St. Peter submitted to a public examination he made a very poor showing; the great Drake, after setting ablaze the hearts of English seamen with a fierce resolve to break the ruthless might of Spain, managed to secure from his queen, after paying a tremendous fee in Spanish gold, a certificate to the effect that he was not a pirate and outlaw; and in the great days of the sailing clippers many of the most famous drivers were without certificates of competency. But in all departments of human endeavor the State more and more assumes the right to compel men holding positions of responsibility to submit to a test of qualifications. Miners, railwaymen, plumbers are being required to pass examinations.

In England and Ireland, no fishing boat, being a trawler of 25 tons burthen and upwards, may leave port without a duly certificated skipper and a duly certificated second hand. In Canada provision is

made for the examination of fishing skippers, but it is not compulsory for small vessels to carry certificated men. However, just as Canada copied the Merchant Shipping Act from the Mother Country, it is likely it will eventually follow along the same lines in respect to the fishing service, and for this reason the Board of Trade requirements are worth noting. According to the instructions to examiners and notices to candidates these are:—

For Second Hand.

A candidate for a second hand's certificate will be required to pass in the following subjects:—The eight tests; reading and writing; the working out of a few sums in simple numeration, addition, subtraction, multiplication, and division; the marks on the lead-line and the use of the lead; taking bearings by compass; ability to use a chart and find the course and distance between two points on the chart, and the ship's position by cross-bearings of two objects; the Rule of the Road at Sea, and generally the duties of a second hand.

For Skipper.

A candidate for a Skipper's Certificate will, in ad-

dition to the subjects required for a Second Hand's Certificate, be required to work out a few sums in compound addition, subtraction, multiplication and division; to understand the use of the sextant, and be able to observe with it, read on and off the arc, and find the index error by the horizon; to be able to find the latitude by meridian altitude of the sun; to understand what is meant by deviation, variation, and local attraction of the compass; to find the deviation of his compass by bearings of two objects when in line, and by bearings of the sun at noon, and approximately by the Pole Star; to find the ship's position by two bearings of the same object, the course and distance run between the bearings being given; to find the ship's position approximately by the latitude and line of soundings; and generally the duties of a skipper of a fishing vessel as at present.

Limited Certificates.

A candidate for a Limited Certificate as skipper or second hand will be examined in the sight tests, reading, chart, and all the oral subjects prescribed for the grade of certificate required, but the examination will not include writing, arithmetic, use of sextant, or finding the latitude by the meridian altitude of the sun.

An adequate system of technical schools for fishermen would be difficult to establish in Canada, owing to the fact that so many live far from centres of population. But the general standard of elementary and secondary education is higher than in England, and the young fisherman with the average public school education could qualify himself by self-study to pass the examinations. At present, however, facilities are lacking.

In Canada small, cheap hand-books on elementary navigation such as are available to the fishermen of France or England are not readily accessible. Outside of Halifax, nautical works of any kind are hard to get. And there the works on navigation usually displayed in the show windows are formidable-looking tomes; not the kind of thing at any rate, to intrigue a young fisherman thinking of spending a few dimes on the small treatise on navigation. In order to arouse the interest of young fishermen, the Fisheries Department of the Government might publish small, cheap handbooks on navigation, and advertise them in the columns of a journal like the Canadian Fisherman. It might go farther and provide something in the nature of a correspondence school course.

Bounties



MANY years ago France adopted the policy of paying bounties to the owners and crews of deep-sea fishing vessels. The government of the day was less interested in the development of the fisheries from a commercial point of view than in the maintenance and enlargement of a nursery for the navy; and successive governments, moved by the same considerations, carried on the same policy, modified slightly now and then to meet new conditions.

In recent years the state changed its attitude somewhat. As warships became gigantic boxes of machinery, requiring mechanics and specialists of all

sorts, less importance was attached to the fisheries as a recruiting ground for the naval service. More and more the state authorities began to consider the deep-sea fisheries from an economic point of view. In 1911 the French parliament adopted legislation, evidently dictated more by the desire to develop the deep-sea fisheries as a national asset than to maintain a nursery for the navy. This legislation is the more significant in that while envisaging the possibilities of the deep-sea fisheries, and providing new forms of encouragement, it contemplated the gradual reduction of state assistance. The act of February 26, 1911, ordained a system of subventions, operative from July 1, 1911 to December 31, 1916. It provided also that between January 1, 1917, and December 31, 1921, the various bounties should be reduced by ten per cent, and that between January 1, 1922, and December 31, 1926, there should be a further reduction of 10 per cent. At the end of this period of 15 years new legislation will be required.

The bounty system applies to the fisheries of Newfoundland, Iceland, the Feroe Islands, the Dogger Bank, and the West Coast of Africa. The amount of money which the French government pays out in bonuses varies from year to year. In 1877 the amount was 1,366,158 francs; in 1910 it was 6,231,834 francs. The average during nearly 50 years past has been about 3,000,000 francs, or \$600,000 yearly.

The bonus paid to the ordinary deep-sea fishing hand is only 30 francs a year. Men attached to the deep-sea fleets as curers receive 50 francs. Masters and second hands have special subventions.

More important is the bonus paid on the exportation of dried cod from France, or the place of fishing, to foreign countries or the colonies. This bonus ranges from 12 to 20 francs per metric quintal (220 pounds). The whole is only paid if the customs duty of the country to which the fish are sent is 10 francs or less per quintal; the bonus is reduced by one franc per each franc of customs duty above 10 francs. Indirectly the fishermen benefit from this subvention, since the merchant owner is enabled to meet competition in foreign markets, and pay bigger shares or wages.

A bonus of 15 francs per 100 kilogrammes is paid on all cod roes landed by the fishermen. Cod roes are extensively employed as bait in the sardine fisheries. Shore fishermen or associations of fishermen are given a bonus of 15 francs, if they buy cod roes from the French deep-sea fishermen.

Vessels in order to receive the bounties, must comply with certain conditions as regards equipment, and the housing and provisioning of crews. Regulations adopted under the general provisions of the act have considerably improved the lot of the French fishermen.

Just before the war France employed in her deep-sea fisheries about 10,000 fishermen; not as many as some years previous. The more expensive employment of steam trawlers having the effect of reducing compliments. Their total catch ranged in value from 25,000,000 to 32,000,000 francs per year, with an average during the decade, 1904-1914, of 29,000,000 francs, nearly \$6,000,000. Of the catch of cod about 24 per cent was exported to foreign countries, the principal markets being Italy, Greece and Spain. The bounties paid averaged about 10 per cent of the value of the catch. Possibly as a result of the war the military view of the value of the bounty system may acquire a new importance.

The Order of the British Empire

A New Knight For Grimsby.

For some considerable time now it has been known that men (and women) who have rendered their country during the war exceptional and conspicuous service other than military would, in due course, have such service officially recognized by the bestowal upon them of a new "order" called "The Order of the British Empire." A first list of recipients was published in all the daily papers last Saturday morning, and it gave great satisfaction in the Borough and Cleethorpes, but particularly "down dock," that one of our own fellow citizens in the person of Mr. Thomas Robinson, J.P., C.C., had received the great distinction. He has been appointed a "Knight Commander of the Order of the British Empire." He is now Sir Thomas Robinson, K.B.E., and his wife becomes Lady Robinson.



SIR THOMAS ROBINSON, K.B.E.

There has been so much in the Press lately about the methods by which, in pre-war days, honours were obtained from and doled out by both political parties that it is refreshing to be able to chronicle that no financial considerations of any kind have entered into the arrangements for the bestowal of the present order, but only service, patriotic unremunerated service to the Empire in the time of its greatest need.

The motto of the new order "For God and the Empire" will appeal to many by its directness and simplicity and, if we mistake not, will be at least silently

adopted by others who are working their hardest in the common cause at this critical time of our national history. When the full story of the war comes to be written the needs of the men and women of Grimsby and Cleethorpes will constitute a glorious page therein. Already many coveted honours have been bestowed upon gallant fighters from our midst, and the present recognition of the arduous and important work done by leading civilians amongst us is as gratifying as it is well deserved.

Mr. Robinson received the first official intimation of what was in store for him from Buckingham Palace nearly nine weeks ago, and this was followed a few days ago by the following letter from the Prime Minister:

10, Downing-street, Whitehall, S.W.I.

Dear Sir,

I have the honour to inform you that His Majesty has been graciously pleased to approve that you should receive the honour of Knight Commander of the Order of the British Empire in the forthcoming list of the new Order of the British Empire.

I have the honour to be,

Your obedient servant,

D. LLOYD GEORGE.

Sir Thomas is really not a Grimbarian by birth, as he first saw the light at Cleethorpes as long ago as in 1855. Nobody, to look at his fresh countenance, his alert step, and his jovial ways, would imagine that 62 summers have passed over his head. But so it is, and that fact alone shows that he knows something of the art of living—living well and looking well. His early education was gained at Cleethorpes National School, and that was followed by three years at Humberstone Grammar School, of which institution he is now one of the governors. Books, however, had no great charm for Master Tom. The pull of the sea meant more for him and induced him to start a seafaring life by forming one of the crew of a small vessel of only 19 tons register. He stuck seven years in that ship, afterwards going into a sailing trawler, and eventually qualifying as skipper. Thus began the first steps in the ladder which has led him up and ever up from fisherman to knight, and given him the unique distinction of being the first fisherman in this country ever to be knighted.

Sir Thomas was well under thirty when he started business for himself ashore, first as a fish merchant, then as a trawler salesman and later as a steam trawler owner. About fifteen years ago he paid his first visit to the great Dominion of Canada. There, as here, fish had a wonderful attraction for him, and induced him to make several journeys across the Atlantic, with the result that he became interested in "The Canadian Fish and Cold Storage Co." at Prince Rupert, in which concern he holds the position of Consulting Director. Other successful ventures in Eastern Canadian Fishing placed him in the position of being able to advise the Government, where, soon after the outbreak of war, they could put their hands on colossal supplies of frozen fish with which to augment the food supplies of this country as well as provide an agreeable change of diet for the troops. Over two years ago Sir Thomas patriotically put his knowledge, his experience and his services at the disposal of the Government. For many months he has been a member of the Cured Fish Committee and also adviser to the Fish Food Committee. His duties have necessitated his residing in London

the greater part of his time, and the knighthood bestowed upon him is some measure of the Government's appreciation of the services he has been able to render to this country, to the Allied cause and to the Empire.

In congratulating Sir Thomas upon the high distinction he has attained we must not forget the no inconsiderable part played in his career by his splendid helpmate. It was in 1876 that they entered "double harness"; they have always pulled together and always in the direction of what was truest and best, and very cordial good wishes will go up from all Grimsby and Cleethorpes that Lady Robinson may live long to enjoy the well-merited honour which has descended upon her and hers.

Space fails us to chronicle Sir Thomas's efforts as a county councillor on behalf of Lindsey teachers and education generally; to speak at length of his distinguished connection with the Port of Hull and Primitive Methodist Orphanages, or to dilate on the services he has rendered to his church, but we do say to him, on our own behalf, and on behalf of the great town and industry with which he is connected, "Well done, Sir Thomas, and may many a happy year still be yours in which you may utilise your talents to the full for God and the Empire."

MR. PERCY BOUTILIER'S DEATH.

Port Hawkesbury, C.B., mourns the death of Mr. Percy Boutilier, for over ten years an active and respected citizen. In conjunction with his brother, President of the National Fish Co. Ltd., he formed the above company a few years ago, and as a result of their efforts a large business with splendid connections has been built up. The deceased was chiefly instrumental in making Port Hawkesbury the headquarters for cold storage in Canada. It was the Boutilier brothers who initiated, formed and brought into operation the North Atlantic Fisheries. Only to them belongs the credit of the existence of the Leonard Fisheries.

Mrs. Boutilier was also badly injured as a result of the auto-accident. Mr. J. K. Johnes, the former efficient book-keeper for the company, is promoted to the managership in succession to the late Mr. Boutilier.

CREAMED SHARK SERVED AT COMMERCE CHAMBER DINNER.

An Agent of the Bureau of Fisheries, engaged in the work of inducing the people of the South Atlantic States to make proper use of neglected fishery resources, recently gave an interesting demonstration in Raleigh, N. C., on the occasion of a dinner given by the Chamber of Commerce in honor of a distinguished visitor. At the conclusion of the banquet the Bureau's representative, Mr. C. Arthur Orr, made some remarks about his work and asked for an expression of opinion regarding the fish course. There was nothing but praise for the dish that had been served, and it was not until Mr. Orr made his announcement that any one at the dinner was aware of the fact that the dish was creamed shark.

A company has taken over an old tannery in Pittsburgh with the intention of operating it hereafter exclusively for the handling of fish skins. The company advises the Bureau of Fisheries that, at the outset, it will be able to handle 150 skins daily and that it is in the market for any shark skins 2 feet or more in length.

The Wondrous Ocean

"And, best of all the long, quiet hours at the wheel, hours when life seemed nothing but still waters, and slow moving shores sunshine and brooding clouds, the throb of a living hull, the beat-beat-beat of a faithful engine, hours when care and worry were forgotten dreams, when pain and loss turned, somehow into blessed memories; and when, as the foaming miles were left behind, and ever new miles stretched out before, the very peace of God came over one's heart and soul. You've been there, haven't you?" — William Davenport Hulbert.

These beautiful words prove the value of the grey old ocean to the inspired writer. Many are they who have sung its praises where the zephyr simoons, so spsily fragrant, blow caressingly across its calm expanse around the climes where it is ever summer, and at night the golden moon hangs low in a languorous sky. Much too has been written of its tigerish violence, when rude Boreas has reared the giant rollers high in crested strife. Romance brings her quota of tales out of the past, of those who, wild rovers in search of fickle fortune, trailed the vasty deep and left their annals of dark crime.

Modernity sends its menace, the submarine, and mother Shipton's prophecy is realized, because, "Under water man may walk, sleep and talk". Leaving all else aside, there is another aspect of the ocean which, under present circumstances, is vastly interesting to all Canadians, at home or abroad.

The Fisheries of Canada, forming half of the industrial life of our Country are well worth our consideration. There are close to one hundred thousand men employed in the deep sea and inland fisheries of Canada, and, besides, numbers of other employees of both sexes in the numerous industries, canning, and other fish curing establishments. All of these help to support various other industries, and all of this great production of wealth is drawn from the great ocean and lakes and rivers of our native land, teeming with fish of all kinds, easily taken, and turned to uses for our benefit. Why, therefore, should any Canadian read with apprehension the news that "Bacon and beef are becoming scarce?"

Around the streets of any city in Canada, today, will be found scores of youths, HALF educated in our public schools, unfitted to earn their living, who could, had things been otherwise, be now engaged in taking from the waters of Canada that bountiful harvest that will never fail us. To what end are boys that have to WORK young, kept at algebra and kindred studies when a course of navigation would be more to the purpose, and technical training in the work of the fisheries given to those desiring it? It is a notorious fact that there are too many professional men, as well as too many doing work that is effeminate. If these men, only one of whom, say, in one hundred, ever amounts to anything, had been given their choice, the pay of the present day fisherman would tempt them if nothing else.

The winter fisherman, whom the smug clerk pities, and it may be looked upon superciliously, nevertheless has five times the clerk's earning capacity. Two days winter fishing out of a week give the fisherman thirty dollars to turn into the exchequer of Canada. AND FOUR DAYS LEFT IN THAT WEEK BESIDES UNINCLUSIVE OF THE SABBATH.

It would be well for those responsible for the public education of the youth of Canada, to institute a course of lectures in the schools, illustrated, so as to make them interesting; and the movies, instead of presenting the cut and dried triangle, of divorce, etc., might just as profitably introduce plays that show something of the industrial life of Canada. Is not the picture of a graceful schooner gliding along under full sail as inspiring as a scene wherein the heroine looks through a keyhole at her recreant husband, and so on ad nauseum? And see the dories going over the side, and the 'set' by torchlight. There are many real things in our beautiful country that the youth of its by ways knows nothing about. They know that pirates were once the sporting element who thronged the seas; but would not the life of the high liner be just as interesting, especially the account of his crew sharing nine hundred dollars per man for a trip, as the voyage of some blood thirsty rover whose harvest of crime brought nothing but remorse or death?

In Canada today, fish is not eaten in a great many homes other than once a week and then due to religious scruples.

The growing scarcity of meats of all kinds makes it imperative that we use more fish. The using of fish once each day will help also to solve the fuel question, because the preparation of sea foods takes but a minimum of the time accorded for the cooking of meats. Statistics show that fish is a healthy food, because of its easily assimilated properties. It is nearly as strengthening as meat. The waters of Canada contain numerous varieties, all edible, and the fame of the salmon fisheries of British Columbia is world wide. There is, too, the flavor of the hidden treasure of old ocean upon the fish course, that will inspire the heart to poetic speech. From the depths whence the fisher drew the succulent morsel now upon our table, its finny ancestor gazed upward at the pirate keel, or it may be, splashed against the sides of the galleon of old as she lay to. On moonlit waves the creatures of the vasty deep sport along, gliding in and out of the little coves and sweet rock strewn crevices of our coast, murmuring seas flowing all about them, our hope of defiance to the enemies legions, those treasures of our wondrous ocean.

(By a Special Lady Correspondent.)

PERSONALS.

Major Hugh A. Greene, Director of Fish Supplies to the Overseas Troops, is expected back from England sometime this month. The major is to be congratulated on having fallen captive to the charms of a fair English Maid, and when he returns, Mrs. Greene will accompany him to Canada.

TO THE WHOLESALE FISH TRADE.

The Fish Committee of the Food Controller's office, Ottawa, is paying half the cost of an improved Fish Display Case. Why not order a dozen or so and distribute them to your retail customers that they may increase their business and yours. The cases will be shipped for \$10 each F.O.B. Montreal, or Toronto.

WOMEN AND THE WAR.

The women of Canada are playing a most important part in the great world struggle at present going on, as evidenced every day by the splendid work they are doing on the various committees formed throughout the country, for the promotion of the interests of the men at the front, and along other lines. The Organization of Resources Committee of the Province of Ontario, recognizing their value in connection with the work they are carrying on throughout the province, recently invited the women of Ontario to form an auxiliary to their Committee, to work in co-operation with them. This auxiliary is now co-operating with the Food Controller in his endeavor to conserve the food supply of the country. Among other things, they are issuing, through the press of the province, appeals to the women of Canada to dedicate themselves and their families to war service by signing the Food Service Pledge being issued by the Food Controller. In their publicity matter they are asking the women of Canada to substitute other foods for part of the white bread, beef and bacon their families now eat. Fish is unquestionably one of the best substitutes that could be found for meats, and the women of Canada have it in their power to greatly conserve the meat supply by the increased use of fish as an article of diet.

The Canadian Fisherman is in full sympathy with the Women's Auxiliary of Ontario in the effort they have undertaken, and feel sure that what they have set out to accomplish will be done by the hearty co-operation of the women in this country as has been done in all other undertakings with which they have been connected since the start of the war.

GLOUCESTER'S BIGGEST FISH DAY FOR AT LEAST 25 YEARS.

Gloucester had its biggest fish day in a quarter of a century on August 20, total receipts up to noon that day being estimated at nearly 5,000,000 pounds of various kinds of fish brought in there since the preceding Saturday.

The heavy mackerel arrivals of course swelled the receipts, as did a dozen British crafts, 11 of whom had a total alone of 3,714,000 pounds of salt cod and one 1180 barrels of pickled herring.

Fresh mackerel receipts figured nearly a half million pounds alone, or to be more accurate, 488,000 pounds, while there were 1010 barrels of salted mackerel besides, totalling 202,000 pounds, it is estimated.

One shacker with a total of 170,000 pounds salt and fresh fish, brought the morning's total up to 4,810,000 pounds, which is the port's record for any one day in the last 25 years, at least, and perhaps longer.

Other arrivals, which will probably be recorded, brought the total to nearly 5,000,000 pounds, the largest fish day for any New England port in 25 years at least, and perhaps longer.

LESS DANGER.

Passenger—Why are we going so slow?

Captain—This is the shallow part of the bay.

Passenger—But I should think you'd go slower in the deepest part. There's more danger of drowning there.—Philadelphia Ledger.

Practical Hints on Conserving Food

On account of the wholesale waste of **fruit and vegetables** in the city and district, it is time that the women realized that in order to win the war they must save every ounce of food available and practice strict household economy. Such was the sentiment expressed at a recent meeting of the Local Council of Women.

At the present time in this city several instances are known where raspberries and black currants, as well as cherries and vegetables are spoiling for the want of being picked or taken care of.

This might bring to the minds of many the present high cost of sugar, but it is well to remember that a more up-to-date method of canning fruit is one that does not require sugar. Sugar adds nothing to the keeping qualities of a properly sterilized and properly sealed product. It is because it is thoroughly sterilized and properly sealed that it keeps. Fruits canned with sugar lose much of the original exquisite flavor of the raw fruit, and as sugar is constantly advancing in price it may well be eliminated in some of our canning. Sugar, of course, may be added in serving, as is done with raw fruits, allowing each person to sweeten to taste, and in this way less will be required than for preserving, and furthermore the outlay will be scattered over a period of time and will not interfere with the purchase of fruit and jars in the preserving season.

The following is a tested recipe for red raspberries or similar fruits:

Red raspberries may be canned without sugar and will keep splendidly. Pick over and clean berries, put in jars cold and fill same with cold water. Put tops on jars; do not put rubbers on or seal down tight, and place same in a boiler or basin of cold water, water to the neck of jars, bring same to a boil gradually and boil until fruit and jars are thoroughly sterilized, about fifteen minutes, then remove, place rubbers on jars and seal down. Put away in a cool, dry place. This recipe is reliable if properly carried out. A little melted parawax will hermetically seal the bottles and secure its keeping.

Vinegar also may be made more economically at home and at quite a saving. From three pounds of brown sugar, which will cost about twenty-five cents, and two gallons of fresh water, and one-half a Royal yeast cake, a splendid vinegar may be made. This should be kept in a warm place for about three days and in six days will be ready for use. Vinegar at the present time costs fifteen cents a quart and at twenty-five cents for the sugar two gallons of vinegar may be made for this amount of money, which at the store will cost \$1.20.

Quite a number of women do not understand the proper method of canning vegetables and fruits, and it is well to remember that every piece of food, whether fruit, vegetable or meat, no matter how fresh, is filled with tiny, invisible organisms, which cause it to spoil. These organisms are in two classes, yeast spores which attack fruits, and which die at from 170 to 180 degrees Fahrenheit, and bacteria, which attacks vegetables and meats and which is killed only at 212 degrees of heat.

This is the reason that oftentimes when vegetables or meats are cooked in an open kettle and canned, they do not keep. Meats and vegetables should always be cooked in the jars and not exposed to the air. Fruits may be cooked in an open kettle and put in the

jars hot, and it will keep well if the temperature is studied.

Fish may also be canned at home. The following is a splendid tested recipe for the canning of salmon, which is so plentiful and so reasonable, particularly at this time of the year.

Clean the fish, take out the backbone and cut into convenient sizes and pack in jars, pepper and salt to taste, fill jars with cold water and place clamped cap on jars. Place jars on a rack in an ordinary wash boiler and heat gradually, and after water is boiling keep at 212 degrees or rapidly boiling, for four hours. Fill boiler to necks of jars and keep the water up to this mark for the full boiling period. Salmon canned in this manner is delicious and will keep indefinitely.

Now that string beans are on the market and are to be had in quantities a very good recipe for canning same is the following:

Have the beans as fresh from the vines as possible. Be sure all pods are tender and brittle—old pods do not cook well. Cut (do not break pods) into convenient lengths, or leave them whole. Pack jars solidly full, fill to overflowing with fresh cold water. Place jar caps on and proceed as for berries as above, only boil for three hours. Keep lid on the boiler all the time of boiling.

The above directions may be carried out in canning any other kind of solid vegetable.

Patriotism may be emphasized by housewives, particularly at this time of the year in purchasing B. C. home grown products. In doing this they not only encourage the producers but keep the money in our own province which otherwise would be paid out in excessive freight rates, duty charges and in profits to an outsider, and at the same time they are doing their duty by their country.—British Columbian.

PROPOSAL FOR A CITY FISH MARKET.

Chairman of the Fish Committee, Department of the Food Controller, Reports on Investigation.

Mr. Frank R. Beer, chairman of the fish committee in connection with the Food Controllers Department, Ottawa, wrote the Mayor from Toronto that the matter of prices at Halifax and elsewhere for sea fish had been under consideration by the committee for some weeks with a view to suggesting a course which might prove satisfactory and feasible. It appeared that in a seaport town, where the fish are actually delivered from the fishing boats, he wrote, there might with advantage be arranged a fish wharf market where retailers might buy direct from the fishermen. The investigations made as to costs of retailing in various cities led the committee to the conclusion that a fair spread for the retailer in the case of low priced fish was from 3 to 4 cents per pound, according to local conditions.

For high priced fish a larger spread would be fair. The shrinkage involved in the fish business and the added cost which frequently occurred where parcels were required to be delivered would be understood. The committee was of opinion the municipal authorities were best able to judge just what spread was fair in each case.

The Mayor brought the letter before the City Board of Control recently and the market suggestion was referred back to him for report.—Quebec Morning Chronicle.



Canadian Oysters

J. STAFFORD, M.A., Ph.D., Montreal.

IV. Culture.

This series of brief articles, setting forth the chief events in the life and culture of the oyster, embraces first (for July) the Adult Oyster (its organization and activities), second (August) the Young (mode of origin, development and growth), third (September) the Surroundings (conditions of existence), and fourth (the present article) the Possibility and Method of Culture.

After becoming acquainted with what pertains to the oyster itself, its structure, activities and mode of propagation (i.e., with its outfit for the duties of life) on the one hand, and with the external conditions under which the oyster is able to live (environment) on the other, we are then in a position to consider methods of culture.

Perhaps the first question to arise is "Can the oyster be raised by cultural methods from the egg to the adult?" The answer is that oysters have not yet been raised and kept under supervision throughout the whole period. It is easy to begin with the eggs of the eastern species and raise them to the swimming stage or even to the early shelled stage (Brooks, 1879). It is not difficult to obtain embryos or larvae of the western species and to keep them alive for a week or more (Stafford, 1911). In both cases the young soon die off, doubtless for want of food. It is possible to change the sea-water, to aerate it, to maintain a suitable temperature, but it is impossible at present to furnish a proper food-supply. The hardest parts are to keep up a circulation of water without carrying away and losing the larvae and to supply food without overstocking and contaminating the culture. It appears possible to overcome these difficulties, even in a small experimental way. Then will arise the need of applying the method on a sufficiently large scale to be of commercial value.

The period through which oyster-larvae have not been kept alive and progressing in confinement has a duration of about two weeks. During this period, in their natural course of existence, the larvae are living a free life in the sea-water of the bays where their parents are and where the eggs were deposited. It was formerly thought that the period from fertilization to the setting of the spat was a very brief one, and all

sorts of guesses were hazarded as to its duration — from a few hours to two or three days. It was not until 1904 that this idea was shown to be wrong, and nearly all culturists are still unaware of the mistake. All the literature before that date, and most of it since, either does not refer to the point at all or is completely astray. The writer, working at Malpeque, P.E.I., in 1904, had the good fortune to correct this mistake and to make out the first complete story of the life of the oyster.

To study the larva during this period requires the employment of methods that had never been especially applied to the oyster. Chief of these is the use of the plankton net. Plankton is the general name given to all minute plants and animals that live suspended in the water and are helplessly carried about by its movements. A plankton-net is made of close-meshed material, such as bolting-cloth, that will allow water to pass through but keeps back small particles. The net is towed by a boat over or in proximity to oyster beds, and the catch is examined by means of a microscope. In this way there can be found all the stages between the oldest larvae raised by cultural methods and the youngest spat to be found on shells and stones. From cultural experiments it may be proved that the first are approximately two weeks old from the time of fertilization and from close study of plankton larvae it may be determined that between the youngest and the oldest larvae there is a space of approximately two weeks. Putting the two together, it takes a month to develop from the egg to the spat. During this month there is a change of size from .05 mm. to .385 mm. — an increase of nearly eight times the diameter of the egg. If the length, breadth and depth of the full-grown larvae were of equal dimensions, as they are in a spherical egg, the increase of cubic contents would be $8 \times 8 \times 8 = 512$ times that of the egg. But as the front and lower edges of the larva are narrow, let us suppose two larvae applied together in opposite directions to be equivalent to an egg in shape, and decide, that there has been an increase of at least 250 times the original cubic contents.

This is a very considerable growth, but a more noteworthy change is the difference between an unorganiz-

ed egg and a completely organized and active larva. Some of the older investigators knew the egg and a few of its succeeding stages. There then followed an interval of about two weeks in the life of the larva upon which there was absolutely nothing known — the changes in size, shape, appearance and organization of the larva, its age from fertilization, the time of the year, and where and how to capture it. They picked up the thread of the narrative again with



Unloading Connecticut Oyster Seed from a Great Northern Car onto a Scow at Crescent, B.C.

the spat. It would seem that, even in the absence of special knowledge of the larva, they should have known that such a minute, unorganized, quiescent egg could not pass to the relatively enormous and complexly organized living spat in the brief period they proposed. It must be remembered, however, that most problems look easy after they have been solved.

The spat is the earliest stage that comes prominently before oystermen. They are familiar with the oyster from some stage of the developing spat onwards to the full-grown oyster. Young spat and stages preceding belong rather to the specialist. Stages from fairly small spat forwards are common property. It is with these that all the more practical attempts at oyster culture begin.

Another question may be asked — Are cultural methods that apply only for part of the life of the oyster worth while? It may be answered — Yes, the culture of fishes, lobsters and other animals applies only for a limited period. We must apply what we know in order to make progress towards what we do

not know and can not yet do. Oyster culture dates from about 100 B.C. Why have not all the difficulties been met and overcome? Many reasons may be given: lack of necessity, disinclination towards research, opposition to all scientific progress, limitation to few investigators, the immensity of the field to be covered etc. The cultivation of oysters has been followed rather as a diversion than a business.

The observation that little oysters are sometimes found attached to anchors, moorings, wharves, boats or other objects, has no doubt been made in different countries and suggested the putting out of solid bodies such as stakes, stones, shells, earthenware, etc., for their reception. Such things used for this purpose have long been known as "cultch" (clutch). In Italy, England, France, Belgium, Japan, United States and some other countries, there are methods of culture that have either descended from the ancient methods or have been developed independently. There would be nothing remarkable about such countries as Italy, England, Japan, United States developing similar methods without knowledge of one another. The set manner of life of the oyster necessitates a certain likeness in the operations of culture. Whether bundles (fascines) of the hazel or the gorse, stakes and branches of bamboo, lumber, tiles, or shells are used, they all have this in common that they are for the countries in which used easily obtainable solid objects put out to serve as spat catchers or cultch.

The oyster culturist, like the agriculturist, is not satisfied with the natural supply; he seeks to increase it by doing something to help nature. The stones, oysters, oyster or other shells, that occur as natural cultch, are not enough. He collects and puts out a greater abundance of shells, or substitutes for them anything else he can procure that he thinks will serve



Starting for the Planting Bed.

the purpose of collecting greater numbers of spat. There is little use of placing these in the water in the autumn, winter or early spring — they do not catch spat then. There has grown up a practice of putting out cultch at certain times in much the same way as farmers sow or plant seeds at certain times. While cultch is lying in the water it becomes coated with sand, mud, or other sediment, overgrown with plant or animal colonies, or covered with an organic slime to such an extent that it restricts the surface exposed or renders it difficult for the larvae to find a suitable

place of fixation. The longer the cultch is in the water the more this is the case. In some places the deposit is greater than at others. Shells may become completely covered. It is a great advantage to delay planting cultch until the very beginning of the time when it will be useful. To determine this time is the point.

The time to put out cultch has been and still is largely judged by the results of previous plantings. A sort of customary time — about the last of June or first of July — has been arrived at, but it is known that at some places this has to be advanced a little and in



Shovelling and Scattering (Planting) the Seed Oysters from a Scow while being towed over the Bed at High Tide.

some years it does not give good results. Those who want to be more exact open oysters to find when a good proportion are swollen with eggs. As long as it was believed that the egg became fertilized, developed and set as spat in a few hours (or days) after being spawned, the time of spawning could be taken as near enough to the time of spatting to be used as a sign for planting cultch. The writer has shown that this calculation is from three weeks to a month astray.

To be quite exact and scientific it becomes necessary to examine the oysters and the water of each bay for every season it is proposed to plant cultch. A few oysters may be examined from time to time in order to follow first the maturing of the eggs and second the spawning. Then plankton collections should be examined every two or three days to follow the growth of the larvae to the largest and oldest sizes. When full-grown larvae begin to get numerous this is the time to put out cultch. Even with the first appearance of full-sized larvae a few shells may be put out and examined daily with a lens to see if spat are caught. The writer has repeatedly put out shells on one tide and found spat on them at the next tide. If the weather looks promising it is best not to delay after the first arrival of the full-grown larvae, or of the freshly-caught spat, because there may not be another so opportune an occasion in the whole season, and because the early spat have advantages of climate, food, growth and defence over those of a later date. the numbers of full-grown larvae in the water. If the numbers of full-grown larvae in the water are backed up by successive broods of younger larvae, there will be contributions day after day of fresh spat on the cultch, which may catch a good set even though the full-grown larvae are not so very

plentiful. A capable experienced man can converge all his sources of knowledge upon the decision to plant or not to plant cultch.

The obtaining of spat is the first and most important event in the whole process of oyster culture. Successful spat grow into oysters. There can be no oysters if there are no spat. The spat is the first stage of the oyster to come under the control of the culturist. Spat become oysters — oysters make cultch — cultch catches spat. This cycle of events is repeated over and over again with accumulating effect.

To procure spat, cultch is necessary. The great bulk of cultch in this country is sure to consist of shells; most of the shells accumulate in the processes of culture. They should be spread out in the sun and shovelled over a few times in order to dry the sand or mud and plant or animal growth on them, and to let it drop off and leave a clean surface. In this condition they should be held ready for the time of planting. Such prepared cultch will catch many more spat than the shells that have been left continually in the water. It may happen that they catch more than can properly develop, but too many is safer than too few — especially when we consider the numerous causes of destruction.

Only few oyster culturists have busied themselves especially with the catching of spat. Some see only



Thinning Out the Planted Oysters and Breaking Apart the Bunches after One Year of Growth. Low Tide.

the money end of the business, and, as advanced oysters are soonest ready for market, they have begun with them. The buying and planting of 3 or 4 year old oysters to be taken up and sent to market in a few months or a year is a very poor kind of oyster cul-

ture—it scarcely deserves the name. The buying and planting of two-year-olds, or of spat, is better. The collecting of spat from natural beds may be better still. The raising of one's own spat is best of all. This last is not only the cheapest way of obtaining seed-oysters, but it is the most satisfying intellectual achievement within the grasp of the culturist.

It must be mentioned that the catching of spat can not be practiced at every place where oysters can be grown. From the experiments we have learned that



Raking Native Oysters into little Heaps to be Carried and Loaded onto a Scow. Low Tide.

the older stages of the oyster are capable of greater defence than the younger stages. Oysters can be grown on flats or beaches that are exposed for several hours to the air and the heat of summer or cold of winter, but such a place is of little or no use for the planting of cultch and catching of spat. The youngest stages of the spat, as well as the preceding stages (larvae, embryos, eggs), must be kept protected by water at all times, otherwise they will soon dry out and die. Many will succeed in living through tidal periods of several hours in the shallow water of sloughs, in the puddles of exposed flats, in the water (one might almost say moisture) held back by tangled ell-grass. It is in the power of the culturist to reclaim portions of bare flats for this purpose by surrounding them with shallow dikes six inches or more in depth. The channels and lower portions of bays, from low tide mark outwards, are, of course, suitable as far as presence of water is concerned, but larval stages are liable to drift out of the bay and never return, and, as larval stages precede spat stages, there will be a great reduction in the number of spat left as compared with the original larvae. In like manner the larvae within dikes will be continually rising and swarming or drifting out of the dikes at each high-water period. But as soon as they are set even the youngest and minutest spat can no longer be lost from this cause. The culturist should collect young spat from less favorable places and store them—cultch and all—in the diked areas, in the sloughs, in suitable parts of channels, just below low-tide mark of suitable beaches and flats, in culture-ponds and other safe places. Protection against air and sun are just as necessary as against frost. To save a second handling, they may be put down at first where they will be fairly safe during the winter season. Of course by that time the spat saved will have grown and thickened their shells somewhat and are not

so tender and easily destroyed as in their earliest stages. The bulk of cultch should be put out if possible in places where it will not need to be removed. There is so much for the culturist to attend to, and there are so many interruptions with his work, that he must save time and work wherever he can.

From the spawning of the eggs to the full growth of the oysters there are natural occurrences and what may be called accidents at work which continually reduce the numbers. The greatest losses are in the young stages. A thin layer of sediment or a slight drifting of sand or mud may cover and crush or starve millions of young. The drifting out to sea or up into rivers by the ebb and flow of the tides may dispose of vast numbers. Exposure to the sun or to rain while stranded on beaches or flats during the period of low tide will take a large toll. The depredations of animals—seals, birds, fish, crabs, snails, starfish, worms, and many others that feed or partly feed upon older or younger stages of oysters—will account for thousands upon thousands. By far the greatest number lose their lives before the spat stage. Before this the young are to be compared in number with the millions of eggs; after this they are rather to be compared with the few adults.

It may be that a culturist's grounds are so situated that he can make most by raising spat and selling to others who buy their seed and plant and grow it to marketable oysters. In this case the seed-raiser is likely to run short of cultch, which will come into the possession of the grower, and the seed-raiser will have to buy cultch back from the grower. Conversely, it may happen that a man's property is not adapted to the raising of seed but is suitable for the growing of oysters. In that case he must buy his seed from the seed-raiser, to whom he can supply cultch. It is best, if possible, to carry on both sides of the industry. This is one of the things to be kept in mind when selecting grounds and planning the business.



Towing Two Scows Loaded with Oysters to the Wharf.

The culturist may be able to obtain seed near at hand, either from natural beds or by buying, or may have to bring it from a distance by boat or by train. In the latter case there arises the need for care in handling and shipping. The oyster is a salt water animal. But it has to be removed from the salt water and transported in the air. It closes its shell and retains a quantity of sea water, which keeps its gills and other

parts moist, preventing adherence, and serving to some extent in carrying oxygen to and carbon dioxide away from the body. If oysters were packed by hand for a long voyage, and had a good chance of being left in position, they should be placed with the deep left valve downwards, so as best to retain the enclosed sea water, or, in case they gaped for cool air, they would not lose the water. It is well to have ventilation, so as to facilitate any respiratory action that there is. At the times when oysters are transplanted the air is generally warmer than the sea, consequently cars should contain ice to cool the air, but not placed so as to freeze the oysters. Extremes either way should be avoided. They should not be left ex-

individuals may be taken advantage of in extending the beds and increasing the number of oysters. It may happen that with little help the edges of the beds may be extended to include new areas, either by breaking down and spreading the shells and oysters or by bringing fresh cultch and distributing on neighboring grounds. Wherever there are isolated bunches or individual oysters attached to stones, gravel, piles or other objects, it is a sign that more could be obtained by putting out cultch to furnish points of fixation for the swimming and floating larvae. Natural beds are valuable starting centres from which to spread in all possible ways.

New beds may be originated in favorable places by preparing a suitable bottom and distributing cultch. Even muddy areas may have a supporting crust formed on top by spreading sand, gravel or shells and making a thicker, heavier surface for the cultch to rest on. If such a prepared bed is not too far from a natural bed, or if the tides or currents are favorable, it may become seeded naturally. But this should be assisted and hastened by planting full-grown oysters among the cultch, to act as spawners.

Oysterless bays may sometimes be converted into oyster bays by a similar process. Suitable places are selected by comparison with natural oyster bays, or suitable areas are prepared by cleaning, levelling, stiffening or otherwise improving the bottom. Then cultch and spawners or seed, or both, are planted.

An oysterless bay in an oyster region is more likely to be successful than one in an oysterless region, for the reason that the climate, the character of the bay, the depth and salinity of the water, and the nature of the bottom are more likely to be nearer the requirements.

From Halifax Harbor to the Bay of Chaleur there are many small, shallow-water bays that could perhaps be made to raise oysters. The Bras d'Or Lakes and Caraquette Bay are at present the productive ex-



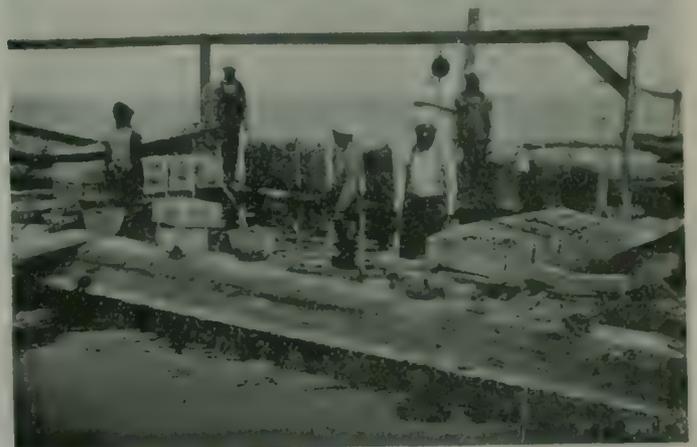
Sorting and Trimming Oysters.

posed on wharves, and the time out of water should be reduced to the minimum.

The most convenient way of planting either oysters or shells is to scatter them with a shovel from a scow, while being towed by a boat at high tide, the area having been selected and staked out beforehand. Shells that fall through even a depth of one or two feet of water without interference with one another will light with the convex side down, concavity upwards. As the part they rest on is not available for spat, and as part of the concavity will doubtless fill with sediment, it results that the catch is generally around the edge, above or below. Oysters most frequently fall on the left side.

After spat have grown one or two seasons they should be sorted on the beds and the bunches broken apart and distributed so as to have enough room for growth and feeding without interference.

Natural beds of oysters or scattered bunches or



Boxing Eastern and Sacking Western Oysters to be Sent to Market.

tremes, but, taking into account the records of earlier distribution, it would appear that the oyster is becoming more and more restricted to narrower limits. The bays that formerly supplied oysters but do not now can not have changed much as yet. Their natural adaptations, with the assistance of artificial methods of culture, may still bring them within the power

of man to re-stock. From the Bras d'Or Lakes westward the tendency is towards the conditions found in the Bay of Fundy. From Caraquette Bay northward the resemblance is towards Gaspe and Seven Islands bays.

While the native oyster of British Columbia extends from the region of Bella Bella to that of Sooke, the productive bays are restricted to shallow water extensions of the Gulf of Georgia. Its culture is at present confined to Boundary Bay and Oyster Harbor. Atlantic oysters have been transplanted to Boundary Bay, Oyster Harbor, Horse Shoe Bay and Esquimaux Harbor by oyster companies, and in small quantities to several other places by the Dominion Government. The oysters grow well for a year or two and spawn, but the young do not live to the spat stage.

GERMANY AND THE HERRING TRADE.

A Sidelight on the "Freedom of the Seas."

The action of the Government in procuring against the needs of winter, a large supply of Norwegian pickled herring, and also in arranging for the curing of surplus supplies of the British herring, will give profound satisfaction, as a step in the right direction, to those who hold with the Empire Resources Development Committee, that the harvest of the sea should be the special care of the State in peace as well as in war. The Government has done particularly well in preparing revised suggestions for the preparation of this fish for the table. Half the prejudice against cured as well as against frozen fish has arisen from faulty methods of preparation. The Empire Resources Development Committee has more than once pointed out that the loss of flavor and the flabby condition of refrigerated fish can be largely avoided by proper thawing out.

As to the acquisition and curing of surplus stocks, Mr. V. A. Malcolmson, secretary of the Fisheries Organization Society, and a member of the Development Committee's Fisheries Sub-Committee, calls attention to the immense trade in herring done by Germany previous to the war. It has developed to such an extent that it was sometimes difficult to get the fish for the English market at all. German buyers outbid their competitor and caused the ruin of many British firms, who had to submit to the Germans taking the whole of the herring caught in our waters. Germany made a speciality of herring curing, building extensive plant costing thousands of pounds. She also catered for the world's trade in bottling, tinning, and dry curing, the goods being sent to Russia, Japan, America, and the colonies. Thousands of tons were handled and enormous profits were made.

The British people must see to it that by State development and State encouragement along the lines already initiated and foreshadowed, the wealth in British waters shall remain in British hands or circulate through British trade channels.

CANADIAN TRAWLER LANDS AT PORTLAND.

The Canadian beam trawler Triumph arrived at Portland, Sunday, with a fare of 290,000 pounds of fish. The craft found fish plenty on the Le Have Banks, filling up solid full, and could easily have doubled her catch if she had room, the condition on the Banks, being widely different from those along shore, where the fishermen complain that they are finding fish very scarce.

STEEL FISH CRUISERS LAUNCHED.

Collingwood, Ont., October 3.

Two steel fish boats which are being built to the order of the Government, the work being in charge of Captain J. W. Norcross, have been launched here. The boats, which are of the regular trawler type, are of large dimensions.

The power consists of triple expansion engines, with steam supplied by one boiler. The vessels have accommodation for about a score of men. It is stated that the shipyard will launch a large oil tank steamer before the end of this week.

ANOTHER BEAM TRAWLER FOR GLOUCESTER.

The Seal Now at Portland Having Finishing Touches Done—A Duplicate of the Walrus.

Painters and others are putting the finishing touches on the Gloucester beam trawler Seal, which for the past three months has been lying at the Portland Co.'s wharf, taking on her engines and machinery which were furnished by the local company. Much of the trawler's fittings and fishing gear arrived here a fortnight ago on the Gloucester steamer Antietam, and she will be all ready for business when she leaves here, which she is expected to do in a few days, after having a dock trial of her engines, and making a short run out of the harbor to adjust compasses.

The Seal is considered the last word in marine architecture as regards vessels of her class, she being practically a duplicate of the trawler Walrus, which left here about three weeks ago for Gloucester, she being five tons larger than the latter on gross, but three tons smaller on net tonnage. The two boats are among the largest beam trawlers afloat at the present time, measuring 173 feet in length, 26 feet beam, and 13 feet depth of hold. Both are owned by the Gorton-Pew Fisheries Co. of Gloucester, and although it is understood the United States Government has had an eye on the two boats, it is probable they will be allowed to continue in the business for which they are intended.—Portland Argus.

JAPANESE OYSTER FARM.

In Japan there is a great oyster farm where the bivalves are taught to make pearls. A well known scientist conceived the idea that oysters might be educated and made to work for man. After many years of costly experimentation he discovered the method in use today.

The farm has an area of about fifty square miles and the water varies in depth from five to fifteen fathoms. The farmer selects the spots where the larvae of oysters are not numerous and then he plants small rocks and stones. These are then removed and placed in special beds, where they lie undisturbed until the third year.

It is said that an oyster will not produce a pearl unless it be irritated by some foreign substance. As soon as it feels this it proceeds to cover it with nacre layer on layer, until a few years it has made a pearl. When large enough the oysters are taken from their beds and carefully opened; a tiny speck of some foreign substance is introduced into their bodies, and they are replaced in the sea. By the end of from three to five years the oyster has coated the foreign substance with nacre and this has become a pearl.—Fishing Gazette.

THE FOOD OUTLOOK.

The outlook in regard to food, is disquieting. There is not only a world shortage, but a woefully diminished supply of shipping in which to carry the goods. Those who predicted — and we fancy that Mr. Maurice was among the prophets — that the nation would have to turn to fish, and be only too glad to get any, may yet be justified. One cause of difficulty is Government interference with trade—some of it, of course, necessary, but some quite the contrary. The Ministry of Food, for instance, seems obsessed by the idea that the middleman is superfluous; but to hold this opinion only argues ignorance of the delicate fabric of business. At the present moment firms are being asked to submit their balance sheets so that their profits may be calculated, and in some cases eliminated. It is easy enough for accountants with figures before them to draw conclusions; it is easy, too, to fix prices. But fixed prices do not necessarily yield increased supplies, and if the nation gets through the coming winter without serious trouble it will be lucky. The "Daily Mail" and Co. are urging compulsory rations of bread and meat as well as of sugar. We may come to that, just as voluntary military service paved the way for conscription, but we hope not. A fish ration, of course, could be arranged if constant supplies were ensured, but the task would be almost as difficult as the fixing of maximum prices, against which we advanced what we consider unanswerable arguments last week. In any case every assistance should be rendered to the fishing industry so that there may be greater landings, for if but half that the butchers fear happens we shall need, as a people, every pound of fish we can get. But let there be no mistake about this—the middleman is essential to the fish trade, and all the ink-slinging in the world will not alter the fact. It is unfortunate that at this critical moment the retail price of fish should be so high. According to the figures in this week's "Labour Gazette", the percentage increase in the retail price of the fish on September 1, as compared with July 1914, was 158 in the big towns and 114 in the small towns and villages, or for the whole of the United Kingdom 136. The August figures were respectively 136, 102, and 119. This increase of 17 per cent. during the month is the largest of any recorded, eggs coming next with an increase of 15 per cent. But this fact alone shows the folly of dealing with fish as though it were meat, or lard, or butter, or milk, because it is obvious that common prudence would have led the trade to keep prices down just now if it were humanly possible. Among the perishable articles of food fish is unique. Our readers know this well; we wish that some set in authority, strutting their little hour on the stage, realized it equally.

Happily, fish is unique in another sense. The seas need no sowing or planting, no spraying and tending except to sweep the mines; if we have the men and boats we can count on a plentiful harvest. By the fortune of war a tremendous proportion of our men and boats has been taken for other service. Fresh from a danger area, we realize afresh the invaluable service which our trawlers are doing on patrol and mine-sweeping, and that it is difficult, if not impossible, to spare them for more peaceful pursuits. Sir Auckland Gedde's speech in Glasgow on Saturday last leads us to hope that the trade may obtain his sympathy, if not his active assistance; but it is one thing to make plans for national service and another to carry out those

plans effectively. The Ministry of Food means well, but there is room for considerable difference of opinion as to whether it is doing or is likely to do, well. Ask the butchers and the grocers, to mention merely two food distributors, for their candid opinion; but we will not promise to print it, as our pages are, more or less, for "family" reading.—The Fish Trades Gazette.

GOOD AND BAD FISHERIES.

The fishermen along the Baie Chaleur are no doubt, thinking at the present time that this is a very perverse world. There they are with good supplies of salt, thanks to the foresight of Robin, Jones & Whitman, Limited, and scarcely a fish in sight on which to use it, while over in Newfoundland and in parts of Nova Scotia there have been more fish than there was salt to salt them. The Gaspé coast fishermen have done very poorly this season; just about half the catch of an average year. Of course, there may come improvement during the balance of this month, but unless it does come the season will be one of the poorest the Baie Chaleur has seen for many years. Strange thing, isn't it, that while fish are so plentiful everywhere else the Chaleur waters have been barren. Along the Atlantic coast of Nova Scotia supplies of fish are remarkably plentiful. The steam trawler operating out of Halifax, we understand, has been able to get what she needs without going any great distance away, and as for the coast of Newfoundland and Labrador, they say that the catches have been so very large that often the fishermen could not get them cleaned and pickled before some of them spoiled.

Lobsters.

The "Merchant" is indebted to Mr. R. H. Williams, or Roberts, Simpson & Co., for the following review of the lobster situation:—

In many minds the question arises as to whether the food value of the lobster is at the present day and under existing circumstances commensurate with its cost.

To the consumer abroad Canned Lobster is more expensive than ever and yet to the consumer it is less lucrative. The prospects are that while the present war continues the cost will go on increasing for the former without in any way benefitting the latter. The interim charges account for the difference.

Viewing the matter from the consumer's standpoint it is argued that prices of fish food must be kept low for the public weal. Non-essential items of food should not be increased in price and used only as they may assist in keeping down the costs of more essential articles or as substitutes therefor.

If lobsters sent to Britain or France, for example, shall not exceed pre-war prices, then the price netted by Canadian exporters will have to be about two dollars per case to cover extra freight charges and one dollar per case for additional insurance. Three dollars per case is a conservative estimate. Differences equal to six dollars have been reported. The packer receiving three dollars less needs to provide a minimum of two dollars per case to cover the higher costs of cans, solder, linings and labor and for 1918 may need an even greater margin. This means then he will not be able to afford within 2½ cents per pound of the prices formerly paid to fishermen, and at such a reduction it is questionable whether the business would be worth while attempting.

The matter from the producer's viewpoint may be regarded thus: The average fisherman operates say 100 traps and the cost of such equipment, has increased so that these, with their rope, twine, nails and other fittings, cost twice as much as formerly. If former estimates of \$1.00 per trap were correct, then the equipment will average an extra \$100 per fisherman. His risk of loss from storms becomes correspondingly greater.

Recent government statistics show that an average of 32 lobsters per trap per season are caught, which means that the fisherman averages 3,200 pounds of lobsters per season, and to cover the extra cost of his gear would need to get 3½ cents per lb. more for his catch to produce the same nett results, while the H.C. L increases his need for money is more than ever. Such an extra price means at least \$6.00 per case and if we add five dollars as shown above for cans, freights etc., the consumer should pay at least \$11.00 more per case for his canned lobsters, which means 23 cents extra per pound tin. The English consumer who formerly paid 50 cents per tin should now pay not less than 73 cents and the price for French consumers who have to pay duties in addition would be much higher.

These figures are not excessive but err possibly on the other side, and the averages shown may not apply to every individual fisherman or to each district alike, but they draw the attention of fisherman, packer and exporter to a problem now appearing for the industry. In some districts the fresh lobster business modifies the results to some extent, altho that, too, is confronted with difficulties.

The average fisherman cannot afford to go catching lobsters at lower prices and should not need to while other fisheries with cheaper equipments are producing good returns. Neither can the average consumer afford to pay more for Canned Lobsters while other canned goods and fresh foods remain at lower levels.

The intermediate charges represent profits for steel and oil producers, shipping and insurance companies and others. The losses from the absence of a lobster business would not injure them, but would enable goods needed for war purposes to be substituted and help to shorten the war.

To reduce the prices means an injustice to our fishermen; to increase it will make the consumer suffer. At present neither fortunately are totally dependant upon this branch of industry for food, and had it not been made to appear by the granting of a special lobster season in these provinces for the present time, some had thought the Canadian Government, in their desire for conservation, would have made an effort to declare a close season for this asset, causing slight inconvenience to the people of today, but with considerable benefit for those who are to follow.

These statements are not considered conclusive, but may be found worth some reflection by those interested in the industry.—The Maritime Merchant, Halifax, Sept. 6.

SHIPBUILDING IN CANADA.

One of the most interesting reactions of the war upon Canadian industrial life is that which has caused a recrudescence of shipbuilding.

The Imperial Munitions Board, on behalf of the British Minister of Shipping, has undertaken a program of steel vessel construction in the Dominion. A sub-commission to direct the turning out of wooden vessels in British Columbia also has been appointed and is now actively at work on the Coast. The provincial government is guaranteeing 55 per cent of the cost of this auxiliary fleet.

By the end of June, from one firm's yards in North Vancouver, seven wooden schooners, equipped with twin auxiliary Diesel engines of 320 horsepower, burning crude oil, and measuring 260 feet over all with a 44-foot beam, already had been launched from the ways, and five others are under construction. One and a quarter million feet of lumber—British Columbia fir—are used for each ship, and each ship takes out on its voyage 1,500,000 feet of lumber as cargo, so that it needs no special knowledge to grasp the immense fillip given the coast lumbering industry by this new war undertaking. In fact, before the program was begun the sawmills of the province were everywhere closing down. As I write this—in the early days of July—the first of the auxiliary schooners has just reached Sydney, Australia, after a voyage of seventy-six days. This time will be greatly cut down later, as the initial trip was really by way of an experiment; in fact, the vessel had to put in at Honolulu for engine adjustments, after which her behavior gave all-round satisfaction to master and owners.

Vancouver is situated on a strip of land between the Fraser River and Burrard Inlet; between these two bodies of water, running up into the city like a clawing finger, is False Creek. Six months ago there was a small machine shop on the shore of False Creek. The concern that owned that machine shop is now building six standard steel steamers to the order of the Government, the vessels to be delivered in fourteen months at a contract price of \$8,000,000.

ICELAND FISHERIES.

The results of the herring fishery at Iceland this summer are very poor compared with recent years, owing to a variety of causes, and mainly to the limitations which the circumstances of the war have put upon the disposal of the fish. The total number of barrels of salted herrings prepared up to the end of August was 48,528, as against 314,184 barrels at the same date last year, 256,629 barrels in 1915, and 195,807 in 1914. There was great scarcity of salt and barrels, and foreign herring fishermen were conspicuous by their absence. The cod fishery was successful, motor boats making up to 350 tons and cutters 65 tons.

The Food Controller is paying half the cost of an improved Fish Display Case for the retail fish merchant. They can be secured for \$10. from the Secretary of the Fish Committee, Food Controller's office, Ottawa.

The Canadian Fisheries Association is now helping to Win the War. If you haven't enlisted in it, you are in the slacker class!

CANADIAN FISH FOR ENGLAND.

Great Britain is looking to Canada for increased supplies of fish. Addressing a meeting of the executive Council of the newly formed National Organization of The Fish, Game, Poultry and Rabbit Trades, Mr. Towle, the fish controller, drew special attention to the importance of developing the demand for frozen fish from Canada. In addition to salmon and halibut, he urged the encouragement of the market for commoner varieties of frozen fish, such as cod, hake and haddocks, all of which are now being imported in large quantities for supplies to the army. The Government, he added were in a position to import larger quantities of these fish from Canada, and desired the co-operation of the trade in extending the demand for frozen fish among private consumers. It was very probable that the shortage of meats would have to be met by supplies of fish, and it was hoped that prices of fish would be prevented from soaring the extremes by providing a substantial supply of Canadian frozen fish as well as of pickled herrings.

Mr. H. G. Maurice of the Board of Agriculture and Fisheries recently stated that the fish food supplies landed by British vessels had fallen since the war to about 25 p.c. of the normal, which in peace times was about 800,000 tons a year. In view of the enormous depletion of the herds of cattle available for food, it was quite certain that before very long the fish trades would stand in a position of utmost importance from a national point of view. When the war is over there would be a general scramble of all the nations for food stuffs, and there would not be enough to go round. In the circumstances Great Britain was bound to become a fish eating nation in a sense it has never been.

THE AGREEMENT WITH HOLLAND.

The Fishing News.

The negotiations which have been proceeding for some time between the Dutch owners and the British Government have now been concluded, and a new agreement has been effected regulating the exports of fish to Germany. The object of the British Government is to prevent fish supplies reaching Germany or at any rate, to reduce them as far as possible. In the first two years of the war there was a great increase in the Dutch exports of fish to Germany. High prices were offered German buyers, and the result was the Dutch fishing industry enjoyed a period of the greatest prosperity. The profits, in fact, were enormous, alike for the vessels engaged in the white fishing and for the herring fleet. While this country had no reason to grudge the Dutch their profits, it could hardly be expected to view with equanimity this big importation of food into Germany, and so last year the British Government took steps to check it. A number of Dutch herring boats were seized in the North Sea and brought into Aberdeen, Kirkwall, and other East Coast ports, where they were detained for a number of weeks. The measure was admittedly a strong one, but it could be defended technically on the ground that the vessels were engaged in contraband traffic, that is, carrying food destined for the enemy. This legal point was never threshed out, and the boats were ultimately released. The incident served its purpose, for it led to the Dutch owners accepting an arrangement with the British Government whereby the exports of fish to Germany were severely limited and the bulk of the catch was re-

served for British and Allied or neutral markets.

It has to be recognized, and it ought to be frankly admitted, that the Dutch owners have acted very reasonably and fairly all through in this matter. They took the seizure of their boats in wonderfully good part, and they agreed to the limitation of their profits which was involved in the contract entered into last year between them and the British Government. The first proposal made by this country was that the whole of the Dutch fishing fleet should be laid up and that, in return, we should guarantee the owners their ordinary pre-war profits. They declined this offer—naturally enough, for they wanted war profits and not pre-war profits. Finally a compromise was arranged which may be summarised as follows:—“Germany was to receive not more than 20 per cent. of the catch, 20 per cent. was to be reserved for home consumption, and the remaining 60 per cent. was to be sold to neutrals, such as the United States, it being then a neutral. The British Government was to pay a bonus of 30s to the Dutch owners for every case (of 115 kilograms net or 253 lbs.) of the 60 per cent. sold to neutrals. The fish were still to be sold in the open market. If, for example, Germany offered 60s per barrel and America 40s, the fish were to go to America because the bonus brought the price up to 70s. If, however, Germany offered 75s against America's 40s, Germany was to get the fish if it had not already got its stipulated 20 per cent.” This was the arrangement made last August, and the Dutch fisheries have been regulated under it since then. Whatever the cause be, whether it be this agreement or the obstacles produced by the German U-boat campaign and the declaration of a danger zone, the fact remains that there has been a substantial reduction in the Dutch white fishing. The number of trawlers fishing and the quantity of white fish landed are both materially reduced this year as compared with last.

The new agreement that has been made goes back to the principle originally proposed, namely, that of laying up the fleet or part of it and paying compensation. The proposal is that 35 per cent. of the steam and sailing fleet shall be laid up, provisionally during two months, on condition (1) that the British Government pay substantial compensation, part to be handed over during the currency of the agreement and part after the war, and (2) that not more than 2000 barrels of fish be exported to Germany during the two months. The agreement is provisional for two months, but one gathers that the idea is to renew it indefinitely. While 65 per cent. of the fleet will not be laid up but will continue fishing, its catch will have to be disposed of inside Holland, all except 2000 barrels per two months, which is the most that may be sent to Germany. The arrangement will involve considerable expense to this country in the shape of compensation, but presumably this is money well spent if it prevents food supplies from reaching Germany. The Dutch trawlowers have by a large majority approved the agreement, but difficulty has emerged in connection with the herring section of the industry. It is objected that the agreement, while satisfactory to the trawlowers or those engaged in white fishing, is less favourable to the herring trade, and the latest report is that on this account the agreement may fall through. This will be regrettable. In connection with last year's agreement, by which a bonus was promised upon herring in order to level up prices to what would have been got had all the fish been sold to Ger-

many, it may be noted that the Dutch dealers have put in a claim for 3,000,000 florins, or £250,000, to the British Government as due on this score. A later report from Holland states that the Government has now paid the bonus due, but whether this is the full amount claimed or not is not explained.

PRESENT CONDITION OF "YE ANCIENT COLONY."

(Trade Review.)

St. Johns, Nfld., Sept. 1, 1917.

The future historian of Newfoundland will write down the year of 1917, as one of the most prosperous in the chequered history of the country. The cod-fishery, our staple and main industry will, when the whole catch is gathered in, be the largest on record, and will, we estimate, amount to one million seven hundred and fifty thousand quintals, including Bank, Shore, Straits, and Labrador fisheries. At a local average value of \$8 00 per quintal, this will amount to \$14,000,000. Codoil, lobsters, herring, salmon and turbot, will, we estimate, be worth roundly six millions more, so that our total income from the fisheries will be worth \$20,000,000. A splendid showing for a population of only a quarter of a million people, and forty-five thousand fishermen.

It must be admitted that there is a good deal of reason for the apprehension that prevails amongst the trade in reference to getting this big catch of fish to the markets. Tonnage is scarce, freights are abnormally high, and insurance, especially to Southern Europe, has gone to staggering proportions. The darkest hour is before the dawn, and already there seems to be a break in the war cloud, which shuts off our trade from the Mediterranean markets in Italy and Greece. With the taking of Trieste, Fumme and Pola, rates of insurance will fall and be cut in two, and the danger base of the Austrian littoral being cut off, our ships will probably be able to get up to Italy and Greece before many days. This is the hope that animates the breast of every man interested in the trade of the country. If we are debarred from these markets, with our large Labrador catch, we can see only one eventuality, and that is a big slump in price within a few weeks. We refer now particularly to Labrador fish.

The Shore fish stands a good chance of holding its own, or, at least, declining very little from the present price, even if marketing conditions do not improve. Brazil will take about 380,000 quintals of our new catch; Portugal, 330,000 quintals; Spain, 290,000 quintals; and the West Indies about 80,000 quintals. Another 100,000 quintals will be required by the United Kingdom, Canada, and a few other small importers. This means a total of 1,180,000 quintals. We have yet 570,000 quintals to dispose off. Greece, if we get the way open, should take, at least, 70,000 quintals, and Italy will want 200,000 quintals. If we get into these markets, our estimated surplus is reduced to 300,000 quintals. Half of this will go to the United States — in fact, a good proportion of it is already gone — in the shape of green fish. About twenty thousand of the balance will be absorbed by French West Indies, Malta, Madeira, Columbia, Guiana, etc. We have then left 130,000 qtls. The cold storage plant of the Reid-Nfld. Co. and Nfld.-Am. Packing Co.,

will be responsible for 100,000 quintals to be exported as fresh fish, so that our estimated catch is now down to 30,000 qtls. Allowing for increased consumption in war time, and the fact that the markets of Southern Europe are passing some of our fish on to the French, we may safely conclude that with all our old markets open, the whole catch, large as it is, will be gone into consumption before the new fish of 1918 comes into the market. This is our estimate. If anyone can make a better one, and a more reasonable one, we should like to have it for publication.

It is well to know where we stand in regard to our stable industry, in order that time may be taken by the forelock, and that the Government and the Board of Trade may lose no opportunity of doing everything possible to find ways and means to get our fish into the markets. That we want more tonnage is quite evident. That we should get access to the Greek and Italian markets is imperative. If we, ourselves, can get the means, the Home Government should be called on to help us. Now is the time to make provision. Now is the time to put forward our case in the strongest manner possible.



EXTRACT FROM NEWSPAPERS

"At the thought of what he would accomplish for the Empire, Mr. Macaulay leaped five feet in the air, rubbed his hands together frantically, laughed with delight at the alluring prospect of a fish diet for everyone at 12 cents per pound...."

HALIBUT ARRIVALS AT PACIFIC COAST PORTS DURING THE MONTH OF AUGUST, 1917.

At Prince Rupert, B.C.

- Aug. 1, North Cape, U. S., 8,000, The C. F. & C. S. Co., Ltd.
- Aug. 1, Cora U. S., 7,000, The C. F. & C. S. Co., Ltd.
- Aug. 2, H. & R., U. S., 8,000, The C. F. & C. S. Co., Limited.
- Aug. 2, Lumen, U. S., 14,000, The C. F. & C. S. Co., Limited.
- Aug. 2, Karl F., 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 2, Rennell, 10,000, The C. F. & C. S. Co., Ltd.
- Aug. 2, Agnes B., 8,000, The C. F. & C. S. Co., Ltd.
- Aug. 3, Orient, U. S., 22,000, Pacific Fisheries Co.
- Aug. 3, Olympic, U. S., 20,000, The C. F. & C. S. Co., Limited.
- Aug. 3, Gjoa, U. S., 6,000, The C. F. & C. S. Co., Ltd.
- Aug. 3, Alpha S., U. S., 12,000, The C. F. & C. S. Co., Ltd.
- Aug. 4, Minerva, 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 4, Geo. E. Foster, 60,000, The C. F. & C. S. Co., Limited.
- Aug. 5, Sitka, 12,000, The C. F. & C. S. Co., Ltd.
- Aug. 6, Dolphin, U. S., 10,000, Dybhaven.
- Aug. 6, Convention, U. S., 10,000, Dybhaven.
- Aug. 6, Hilda, U. S., 8,000, Dybhaven.
- Aug. 6, Helgeland, U. S., 70,000, Booth Fisheries Co.
- Aug. 6, Kubien, U. S., 5,000, The C. F. & C. S. Co., Limited.
- Aug. 7, Jupiter, U. S., 10,000, Booth Fisheries Co.
- Aug. 7, Jupiter, U. S., 10,000, Booth Fisheries Co.
- Aug. 7, Viking, U. S., 9,000, Booth Fisheries Co.
- Aug. 7, North Cape, U. S., 8,000, The C. F. & C. S. Co., Ltd.
- Aug. 7, Rose Spit, 10,000, The C. F. & C. S. Co., Ltd.
- Aug. 7, P. Doreen, 15,000, The C. F. & C. S. Co., Ltd.
- Aug. 9, Chief Zibassa, 15,000, The C. F. & C. S. Co., Limited.
- Aug. 9, Teddy J., U. S., 14,000, The C. F. & C. S. Co., Ltd.
- Aug. 9, Liberty, U. S., 6,000, The C. F. & C. S. Co., Limited.
- Aug. 9, Dip, U. S., 9,000, The C. F. & C. S. Co., Ltd.
- Aug. 9, Lincoln, U. S., 12,000, The C. F. & C. S. Co., Limited.
- Aug. 9, Aurora, U. S., 5,000, The C. F. & C. S. Co., Limited.
- Aug. 9, Haysport 1, 10,000, Atlin Fisheries, Limited.
- Aug. 9, Lillian M., 6,000, Atlin Fisheries, Limited.
- Aug. 9, Kitwinmar, 13,000, Atlin Fisheries, Limited.
- Aug. 9, Royal 5, 5,000, Atlin Fisheries Limited.
- Aug. 11, Albatross, U. S., 50,000, The C. F. & C. S. Co., Ltd.
- Aug. 12, Corona, U. S., 27,000, Atlin Fisheries, Ltd.
- Aug. 12, La Paloma, U. S., 35,000, Booth Fisheries Company.
- Aug. 12, H. and R., U. S., 9,000, Booth Fisheries Co.
- Aug. 12, North Cape, U. S., 12,000, National & Independent.
- Aug. 12, Starr, U. S., 12,000, National & Independent.
- Aug. 12, Margaret, U. S., 7,000, National & Independent.
- Aug. 12, D. C. F. 1, 13,000, The C. F. & C. S. Co., Ltd.
- Aug. 12, Margalice, 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 12, Nautilus, 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 13, Yakutat, U. S., 35,000, The C. F. & C. S. Co., Ltd.
- Aug. 13, Selma, U. S., 8,000, The C. F. & C. S. Co., Limited.
- Aug. 13, Director, U. S., 9,000, The C. F. & C. S. Co., Ltd.
- Aug. 13, Tahoma, U. S., 21,000, Royal Fish Co.
- Aug. 13, Bringold, U. S., 10,000, Royal Fish Co.
- Aug. 14, Agnes B., 6,000, The C. F. & C. S. Co., Ltd.
- Aug. 14, Haysport 2, 25,000, The C. F. & C. S. Co., Limited.
- Aug. 14, Alaska, U. S., 35,000, The C. F. & C. S. Co., Limited.
- Aug. 14, Elfin, U. S., 5,000, The C. F. & C. S. Co., Limited.
- Aug. 14, Chief Skugaid, 26,000, The C. F. & C. S. Co., Ltd.
- Aug. 14, Polaris, U. S., 50,000, Booth Fisheries Co.
- Aug. 14, Todd, U. S., 22,000, Pacific Fisheries Co.
- Aug. 14, Tom & Al, U. S., 60,000, Atlin Fisheries, Limited.
- Aug. 16, Amunsden, U. S., 12,000, The C. F. & C. S. Co., Ltd.
- Aug. 16, Onah, U. S., 7,000, The C. F. & C. S. Co., Ltd.
- Aug. 16, Ila, 8,000, The C. F. & C. S. Co., Ltd.
- Aug. 16, Griet Starrett, 13,000, The C. F. & C. S. Co., Ltd.
- Aug. 16, Dolphin, U. S., 20,000, Booth Fisheries Co.
- Aug. 16, Ringleader, 6,000, Atlin Fisheries, Limited.
- Aug. 16, N. & S., 8,000, Atlin Fisheries, Limited.
- Aug. 19, Liberty, U. S., 50,000, Atlin Fisheries, Ltd.
- Aug. 19, Constitution, U. S., 50,000, Booth Fisheries Co.
- Aug. 19, Gjoa, U. S., 8,000, The C. F. & C. S. Co., Limited.
- Aug. 19, Nellie, U. S., 5,000, The C. F. & C. S. Co., Limited.
- Aug. 19, Kubien, 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 19, Hecate, 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 20, Nornen, 6,000, The C. F. & C. S. Co., Ltd.
- Aug. 20, Lumen, U. S., 5,000, The C. F. & C. S. Co., Limited.
- Aug. 20, Geo. E. Foster, 60,000, The C. F. & C. S. Co., Ltd.
- Aug. 20, Sumner, U. S., 35,000, The C. F. & C. S. Co., Limited.
- Aug. 21, Lincoln, U. S., 11,000, The C. F. & C. S. Co., Ltd.
- Aug. 21, Viking, U. S., 7,000, The C. F. & C. S. Co., Limited.
- Aug. 21, Haysport, 25,000, The C. F. & C. S. Co., Ltd.
- Aug. 23, H. & R., U. S., 8,000, The C. F. & C. S. Co., Limited.
- Aug. 23, Teddy J., U. S., 4,000, The C. F. & C. S. Co., Limited.
- Aug. 24, Joe Baker, 6,000, The C. F. & C. S. Co., Ltd.
- Aug. 25, Margaret G., U. S., 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 25, Omamey, U. S., 7,000, Atlin Fisheries, Ltd.
- Aug. 25, Lillian M., 5,000, The C. F. & C. S. Co., Ltd.
- Aug. 26, Director, U. S., 8,000, Booth Fisheries Co.
- Aug. 26, Clara N., 9,000, Booth Fisheries Co.
- Aug. 26, D. C. F. 1, 8,000, The C. F. & C. S. Co., Ltd.
- Aug. 27, Dolphin, U. S., 12,000, The C. F. & C. S. Co., Ltd.
- Aug. 27, Corona, U. S., 12,000, The C. F. & C. S. Co., Ltd.

Aug. 27, Helgeland, U. S., 85,000, Atlin Fisheries, Limited.

Aug. 27, Chief Skugaid, 5,000, The C. F. & C. S. Co., Limited.

Aug. 28, Alliance, 10,000, The C. F. & C. S. Co., Ltd.

Aug. 28, Maud, 7,000, The C. F. & C. S. Co., Ltd.

Aug. 28, Gilford, 5,000, The C. F. & C. S. Co. Ltd.

Aug. 28, Unity, 5,000, The C. F. & C. S. Co., Ltd.

Aug. 28, Andrew Kelly, 50,000, The C. F. & C. S. Co., Limited.

Aug. 30, Onah, U. S., 12,000, The C. F. & C. S. Co., Limited.

Aug. 30, Nellie, U. S., 8,000, The C. F. & G. S. Co., Limited.

Aug. 30, North Cape, U.S., 7,000, The C. F. & C. S. Co., Ltd.

Aug. 30, Aurora, U. S., 5,000, The C. F. & C. S. Co., Limited.

Aug. 30, Haysport, 14,000, The C. F. & C. S. Co., Ltd.

Aug. 30, N. & S., 10,000, The C. F. & C. S. Co., Ltd.

Aug. 30, Margalice, 8,000, The C. F. & C. S. Co., Ltd.

Aug. 30, Grier Starrett, 7,000, The C. F. & C. S. Co., Limited.

Aug. 31, Tahoma, U. S., 15,000, The C. F. & C. S. Co., Limited.

At Vancouver, B.C.

Aug. 3, Madelyne Dyke, 8,000, The Canadian Fishing Co., Ltd.

Aug. 6, Flamingo, 100,000, The Canadian Fishing Co., Ltd.

Aug. 6, Celestial Empire, 70,000, The Canadian Fishing Co., Ltd.

Aug. 6, Canada, 40,000, The Canadian Fishing Co., Limited.

Aug. 6, Pescawha, 40,000, The Canadian Fishing Co., Limited.

Aug. 7, Carlotta G. Cox, 45,000, The Canadian Fishing Co., Ltd.

Aug. 7, Borealis, 25,000, The Canadian Fishing Co., Limited.

Aug. 14, Washington, U. S., 40,000, New England Fish Company.

Aug. 15, Kingway, 55,000, The Canadian Fishing Co., Ltd.

Aug. 17, City of San Diego, U. S., 15,000, Crown Fish Co.

Aug. 17, Madeline Dyke, 10,000, The Canadian Fishing Co., Ltd.

Aug. 20, Celestial Empire, 60,000, The Canadian Fishing Co., Ltd.

Aug. 24, Canada, 30,000, The Canadian Fishing Co., Limited.

Aug. 24, New England, U. S., 100,000, New England Fish Company.

Aug. 25, Carlotta G. Cox, 45,000, The Canadian Fishing Co., Ltd.

Aug. 25, Pescawha, 35,000, The Canadian Fishing Co., Ltd.

Aug. 27, Flamingo, 60,000, The Canadian Fishing Co., Limited.

Aug. 29, Borealis, 35,000, The Canadian Fishing Co., Limited.

At Ketchikan, Alaska.

Aug. 1, New England, U. S., 100,000, New England Fish Company.

Aug. 10, Manhattan, U. S., 140,000, New England Fish Company.

Aug. 13, Violet, 8,000, New England Fish Company.

Aug. 15, Eureka, 5,000, New England Fish Company.

Note: All vessels not specified "U. S." are of Canadian registry.

HALIBUT ARRIVALS AT WEST COAST PORTS DURING THE MONTH OF SEPTEMBER.

At Prince Rupert, B.C.:

Sept. 1, Tahoma, U.S., 15,000, The C. F. & C. S. Co., Ltd.

Sept. 1, Polaris, U.S., 50,000, The C. F. & C. S. Co., Ltd.

Sept. 1, Eureka, U.S., 6,000, The C. F. & C. S. Co., Ltd.

Sept. 1, Nornen, 15,000, The C. F. & C. S. Co., Ltd.

Sept. 1, Rose Spit, 4,000, The C. F. & C. S. Co., Ltd.

Sept. 2, Shamrock, U.S., 15,000, Atlin Fisheries, Ltd.

Sept. 2, Kitwinmar, 8,000, Atlin Fisheries, Ltd.

Sept. 2, Lincoln, U.S., 9,000, Booth Fisheries Co.

Sept. 2, Lumen, U.S., 14,000, Booth Fisheries Co.

Sept. 3, Alaska, U.S., 50,000, The C. F. & C. S. Co., Ltd.

Sept. 3, Gjoa, U.S., 18,000, The C. F. & C. S. Co., Ltd.

Sept. 3, S. & S., U.S., 8,000, The C. F. & C. S. Co., Ltd.

Sept. 3, Stranger, U.S., 9,000, Booth Fisheries Co.

Sept. 3, Todd, U.S., 8,000, Booth Fisheries Co.

Sept. 3, Fram, U.S., 4,000, Booth Fisheries Co.

Sept. 3, Bringold, U.S., 4,000, Booth Fisheries Co.

Sept. 3, Joe Baker, 8,000, Booth Fisheries Co.

Sept. 5, Tom & Al, U.S., 40,000, Booth Fisheries Co.

Sept. 5, North Cape, U.S., 9,000, Booth Fisheries Company.

Sept. 5, Teddy J., U.S., 21,000, Royal Fish Co.

Sept. 5, H. & R., U.S., 7,000, Royal Fish Co.

Sept. 5, La Paloma, U.S., 42,000, The C. F. & C. S. Co., Ltd.

Sept. 5, Glacier, U.S., 12,000, The C. F. & C. S. Co., Ltd.

Sept. 5, Dolphin, U.S., 15,000, The C. F. & C. S. Co., Ltd.

Sept. 5, Magnhel, U.S., 4,000, The C. F. & C. S. Co., Ltd.

Sept. 5, Mayflower, U.S., 8,000, The C. F. & C. S. Co., Ltd.

Sept 5, Illa, 8,000, The C. F. & C. S. Co., Ltd.

Sept. 5, Rennell, 13,000, The C. F. & C. S. Co., Ltd.

Sept. 5, Agnes B., 9,000, Atlin Fisheries, Ltd.

Sept. 7, Jas. Carruthers, 65,000, The C. F. & C. S. Co., Ltd.

Sept. 7, Geo. E. Foster, 35,000, The C. F. & C. S. Co., Ltd.

Sept. 7, Sitka, U.S., 25,000, The C. F. & C. S. Co., Ltd.

Sept. 8, Sumner, U.S., 50,000, The C. F. & C. S. Co., Ltd.

Sept. 8, Orient, U.S., 50,000, Atlin Fisheries Ltd.

Sept. 8, Tide, 4,000, Atlin Fisheries Ltd.

Sept. 8, Doreen, 6,000, Atlin Fisheries, Ltd.

Sept. 8, Nautilus, 6,000, The C. F. & C. S. Co., Ltd.

Sept. 8, Salten, U.S., 4,000, The C. F. & C. S. Co., Ltd.

Sept. 9, Haysport, 17,000, Booth Fisheries Co.

Sept. 9, Karl F., 7,000, Booth Fisheries Company.

Sept. 9, Unity, 6,000, Booth Fisheries Company.

Sept. 9, Maud, 4,000, The C. F. & C. S. Co., Ltd.

Sept. 9, Lillian M., 4,000, Atlin Fisheries, Ltd.

Sept. 10, Onah, U.S., 11,000, Dybhaven.

- Sept. 10, Cora, U.S., 8,000, Dybhaven.
 Sept. 10, Hunter, 6,000, Dybhaven.
 Sept. 10, Corona, U.S., 21,000, Booth Fisheries Co.
 Sept. 10, Murineag, 4,000, Booth Fisheries Co.
 Sept. 10, Saturn, U.S., 8,000, The C. F. & C. S. Co., Ltd.
 Sept. 10, Director, U.S., 17,000, The C. F. & C. S. Co., Ltd.
 Sept. 10, Alliance, 9,000, The C. F. & C. S. Co., Ltd.
 Sept. 10, Chief Skugaid, 30,000, The C. F. & C. S. Co., Ltd.
 Sept. 11, Lumen, U.S., 20,000, Atlin Fisheries Ltd.
 Sept. 11, Decker, Jennie F., U.S., 6,000, Atlin Fisheries, Limited.
 Sept. 11, Gilford, 8,000, The C. F. & C. S. Co., Ltd.
 Sept. 11, Ringleader, 5,000, The C. F. & C. S. Co., Ltd.
 Sept. 11, N. & S., 7,000, The C. F. & C. S. Co., Ltd.
 Sept. 11, Lillian S., 4,000, The C. F. & C. S. Co., Ltd.
 Sept. 11, Margaret G., U.S., 6,000, The C. F. & C. S. Co., Ltd.
 Sept. 12, Margalice, 14,000, The C. F. & C. S. Co., Ltd.
 Sept. 13, Chief Zibassa, 5,000, The C. F. & C. S. Co., Ltd.
 Sept. 13, Grayling, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Sept. 13, Soya, 4,000, Atlin Fisheries Limited.
 Sept. 13, Omaney, U.S., 65,000, The C. F. & C. S. Co., Ltd.
 Sept. 14, D. C. F. 1, 7,000, Atlin Fisheries, Ltd.
 Sept. 15, Mayflower, 12,000, The C. F. & C. S. Co., Ltd.
 Sept. 15, Grier Starrett, 14,000, The C. F. & C. S. Co., Ltd.
 Sept. 15, Shamrock, U.S., 18,000, The C. F. & C. S. Co., Ltd.
 Sept. 16, Liberty, U.S., 35,000, The C. F. & C. S. Co., Ltd.
 Sept. 16, Haysport 2, 7,000, The C. F. & C. S. Co., Ltd.
 Sept. 16, Agnes B., 5,000, Atlin Fisheries, Ltd.
 Sept. 16, Borealis, 13,000, Atlin Fisheries, Ltd.
 Sept. 17, Tahoma, U.S., 22,000, Royal Fish Co.
 Sept. 18, Alten, U.S., 65,000, Atlin Fisheries, Ltd.
 Sept. 18, Polaris, U.S., 55,000, Booth Fisheries Co.
 Sept. 18, Helgeland, U.S., 70,000, The C. F. & C. S. Co., Ltd.
 Sept. 18, S. & S., U.S., 7,000, The C. F. & C. S. Co., Ltd.
 Sept. 18, Lincoln, U.S., 7,000, The C. F. & C. S. Co., Ltd.
 Sept. 18, Dolphin, U.S., 7,000, The C. F. & C. S. Co., Ltd.
 Sept. 19, Andrew Kelly, 40,000 The C. F. & C. S. Co., Ltd.
 Sept. 19, Rose Spit, 5,000, The C. F. & C. S. Co., Ltd.
 Sept. 19, Mars, U.S. 21,000, The C. F. & C. S. Co., Ltd.
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 Sept. 19, Brothers, U.S., 25,000, Atlin Fisheries, Ltd.
 Sept. 19, Glacier, U.S., 4,000, Atlin Fisheries, Ltd.
 Sept. 19, Joe Baker, 4,000, Atlin Fisheries, Ltd.
 Sept. 21, Lancing, U.S. 11,000, The C. F. & C. S. Co., Ltd.
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- Sept. 22, Lumen, U.S., 14,000, The C. F. & C. S. Co., Ltd.
 Sept. 23, Onah, U.S., 16,000, The C. F. & C. S. Co., Ltd.
 Sept. 23, Isla, 5,000, The C. F. & C. S. Co., Ltd.
 Sept. 24, Alaska, U.S., 35,000, Booth Fisheries Co.
 Sept. 24, Tide, 5,000, Booth Fisheries Company.
 Sept. 24, Royal, 3,000, Booth Fisheries Company.
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 Sept. 24, Murineag, 4,000, The C. F. & C. S. Co., Ltd.
 Sept. 25, James Carruthers, 50,000, The C. F. & C. S. Co., Ltd.
 Sept. 25, Hecate, 5,000, The C. F. & C. S. Co., Ltd.
 Sept. 25, Agnes B., 10,000, The C. F. & C. S. Co., Ltd.
 Sept. 27, Chief Zibassa, 16,000, The C. F. & C. S. Co., Ltd.
 Sept. 27, Thelma, U.S., 7,000, The C. F. & C. S. Co., Ltd.
 Sept. 27, Ringleader, 6,000, The C. F. & C. S. Co., Ltd.
 Sept. 27, Mack, 3,000, The C. F. & C. S. Co., Ltd.
 Sept. 28, Seymour, U.S., 30,000, The C. F. & C. S. Co., Ltd.
 Sept. 29, Corona, U.S., 7,000, The C. F. & C. S. Co., Ltd.
- Note: All vessels not specified "U.S." are of Canadian registry.
- At Vancouver, B.C.:**
 Sept. 1, Madelyne Dyke, 8,000, The Canadian Fishing Co., Ltd.
 Sept. 4, Celestial Empire, 80,000, The Canadian Fishing Co., Ltd.
 Sept. 5, Manhattan, U.S., 120,000, New England Fish Company.
 Sept. 10, Carlotta G. Cox, 50,000, The Canadian Fishing Co., Ltd.
 Sept. 24, Celestial Empire, 50,000, The Canadian Fishing Co., Ltd.
 Sept. 26, Madeline Dyke, 5,000, The Canadian Fishing Co., Ltd.
- At Ketchikan, Alaska:**
 Sept. 1, Cora, 5,000, New England Fish Company.
 Sept. 1, North Cape, 10,000, New England Fish Company.
 Sept. 1, Selma, 4,000, New England Fish Co.
 Sept. 19, Tyee, 50,000, New England Fish Company.
 Sept. 23, New England, 100,000, New England Fish Company.

GERMAN SALMON THRIVE IN THAMES.

Some good things come from Germany, and one of them is the German salmon, which is now being bred on a large scale in the Thames and has the advantage of being non-migratory. At least, it is non-migratory in its native waters, but it may change its habit here, as happened with the English and American brook trout which were planted in New Zealand. In English waters the brook trout is never migratory, but in New Zealand they rapidly develop into confirmed sea rovers, and have now become a fine and healthy race of sea trout, affording excellent sport and attaining unusual size.

CAPT. ROBERT A. BARTLETT TELLS OF FISH IN NORTH.

Rescuer of the MacMillan Party Tells an Interesting Story of Fish Found in Arctic Waters.

The Fishing Gazette in its issue of September 22nd, contains the following:—

A graduate fisherman and veteran of perhaps fifteen sealing voyages to the whelping ice fields of Labrador, Captain Robert A. Bartlett, once of Newfoundland and now of New York, is back from the most memorable voyage of his career as an explorer in the frozen North. He rescued the MacMillan party at the entrance to Smith Sound, off North Greenland, and brought its members safely to Sydney, C.B., his last dash to the polar regions being all-important in its result.

"To tell of the fish of the North," said the captain, "would be an almost interminable undertaking, for there are fish in the waters as far into the Arctic as there is water, and for all I know even as far north as there is ice, even in the congealed waters beneath the floes that cross the Poles."

"Fish is more or less a delicacy in the North," said Captain Bartlett, in his discussion. "Arctic explorers seldom have the time to fish, and a fish dinner is a rarity. Still, in the far North there is plenty of **rock cod**, **sea trout**, **char** (a kind of salmon), **caplin shrimp**, and, of course, **seals**, and **walrus**, besides **narwhal**, **right whales**, and perhaps half a dozen other varieties less known in the temperate regions.

"A little farther south the **cod** is to be found, and **halibut** abounds in waters that are frozen over for eight months in the year. I have caught codfish in

Hudson Strait, and the Greeley party actually lived on shrimp at Cape Sabine during one whole summer. The **shrimp** has been found in abundance as far north as Cape Columbia in latitude 86°."

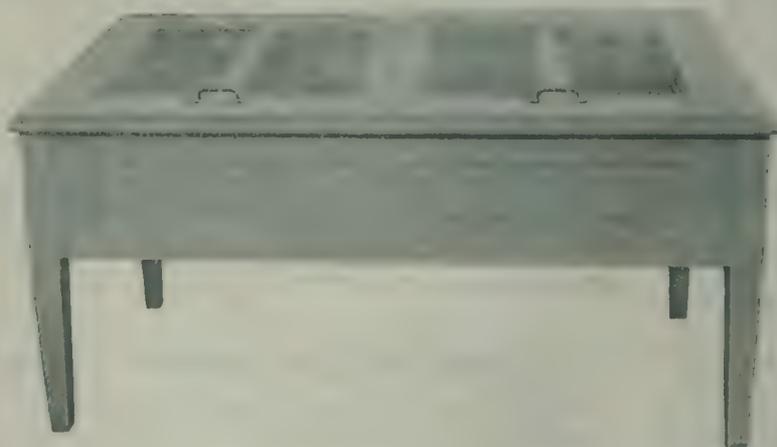
The observations of Captain Bartlett are those of a fisherman whose early training in Newfoundland waters has never been forgotten. In the case of the shrimp they clearly show the wide range of this particular species. Shrimp are found in greatest abundance in the tropical waters about the Gulf of Mexico and off the Atlantic coast of Florida and Georgia.

"Of course, everybody knows that whales inhabit the waters of the great North," continued Captain Bartlett, "but no one seems to have discovered just how far north they go. I have seen them in Smith Sound, three or four at a time, and a few odd ones considerably nearer the polar circle. But, of course, the whale is not a fish. Sharks may be there, too, but I have yet to see one."

Wild stories of the thrasher shark have come from the frozen lands, and they have been described as being the most vicious of the family of sea monsters. If they actually live in frigid waters about Grantland the latitudinal range of the shark is from the Equator to the Arctic circle.

"The only fish that are known commercially to be found in the northern seas are the **sea trout** and **rock cod**. I have caught both in the open waters off the ice-bound coasts of Greenland and Grantland. As the walrus feeds largely on small fish and shell fish, it may be interesting for fishermen to know that there are **clams** in the Arctic. I have seen them in clear waters along the coast of Greenland, and actually taken them. They are fine eating; the Eskimo loves them.

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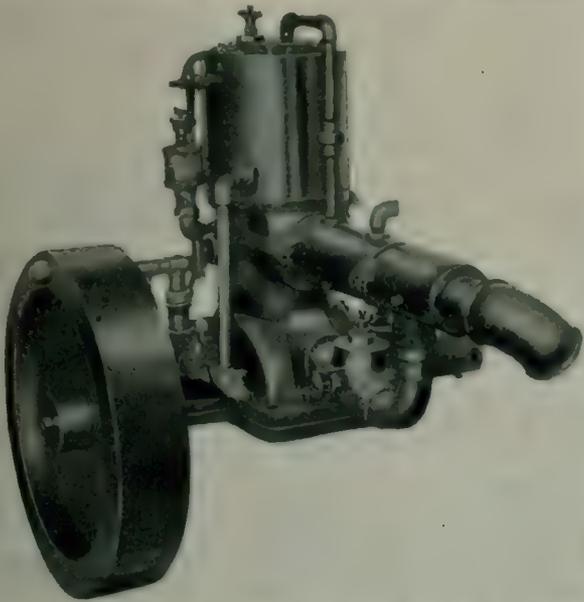
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"Once when a walrus was killed by Eskimos at Cape Sheridan, Grantland, and dressed for use, a quantity of clams were found in its stomach. They were removed and made into one of the best clam stews ever set before men in any climate. Walrus meat is tough and fibred, but the heart and liver are splendid food, and compare favorably with those of the steer, well known to inhabitants of the temperate zone.

"Food fishes that are sold every day in the markets of the United States are no different when taken in the Arctic, than they are in warmer waters. The sea trout found off Grantland, for instance, is a splendid fish, with firm white meat and a delicate flavor. At the same time some of the salmon found in the fresh waters of Lake Hazen are pale or even white. They are known as char in that country, and the Eskimos catch them regularly through the ice. The supply seems to be inexhaustible. At certain seasons the meat is pink, like that of the salmon of Newfoundland, the Pacific Coast and Alaska.

"In the Arctic, off Disco, North Greenland, I have seen rock cod caught in goodly quantities. I tell you it was a delicacy to the men on board ships bound for the polar regions. Many of them preferred to eat it in place of fresh or frozen meat. Also the squid is to be found in latitudes below 80 degrees, and it is a good food.

"In the open sea, in latitude 80 degrees, 30 minutes north, our parties have caught sea trout weighing up to two pounds, and in about the same latitude taken char in fresh water through the ice weighing from four to eight pounds. As far north as 87 degrees shrimp have been found by exploring parties.

"The caplin, which in many respects resembles the sardine herring caught along the coast of Maine, is known to the natives of Greenland as upernavik, and it is taken as far north as latitude 72. It is possible that at other points farther north some caplin are to be found also, but I am telling only of what I have seen with my own eyes."

Captain Bartlett will make another voyage to the Arctic, this time at the head of a party. He proposes to have a ship built of steel strong enough to resist the greatest pressure of ice and sail north from Seattle and go around Behring Strait with the drift.

THE FISHERMEN'S HARVEST.

The high price of food benefits the harvester of the sea as well as of the land. Gloucester, Boston and Portland waterfronts are reported alive with gossip of huge returns. The instance is given of the Gloucester schooner Higo, which sailed to Barnstable Bay on Monday and arrived at Boston next morning with a cargo of mackerel worth \$4,600; the eight members of the crew received \$258 apiece. The Nirvana of Gloucester did even better, making a trip to Portland waters from which she returned with 10,000 pounds of fresh and 41 barrels of salt mackerel, worth \$10,000, yielding each man about \$300. The Natalie Hammond recently landed a mixed cargo of halibut and mackerel for which every member of the crew received \$223; the Waldo L. Stream is credited with bringing in \$226 worth of halibut for every member. The schooner Progress is said to have stocked over \$11,000 worth of swordfish, and to have given the crew \$1,000 each since July 1. Portuguese fishermen who once went out from Boston in dories are now seen in motor boats.

—New York Post.

TO BREAK ALL SEINING RECORDS.

Captain Lemuel Firth continues his wonderful mackerel seining record in schr. Mary F. Curtis. Captain Firth stocked \$12,646 on the last trip landed in Boston a few days ago, and the crew shared \$294.15 for a week's fishing.

Capt. Firth is not only high line of the seining fleet to date, but bids fair to break all records for a season's work in this branch of the fishery. His total stock so far is \$65,610 and the crew have shared over \$1,650. Captain John Matheson's record last season was something over \$67,000, when the vessel was rammed and sunk in Boston harbor. One more trip and Captain Firth will have the record for all time in mackerel seining for a single season.—Shelburne Gazette.

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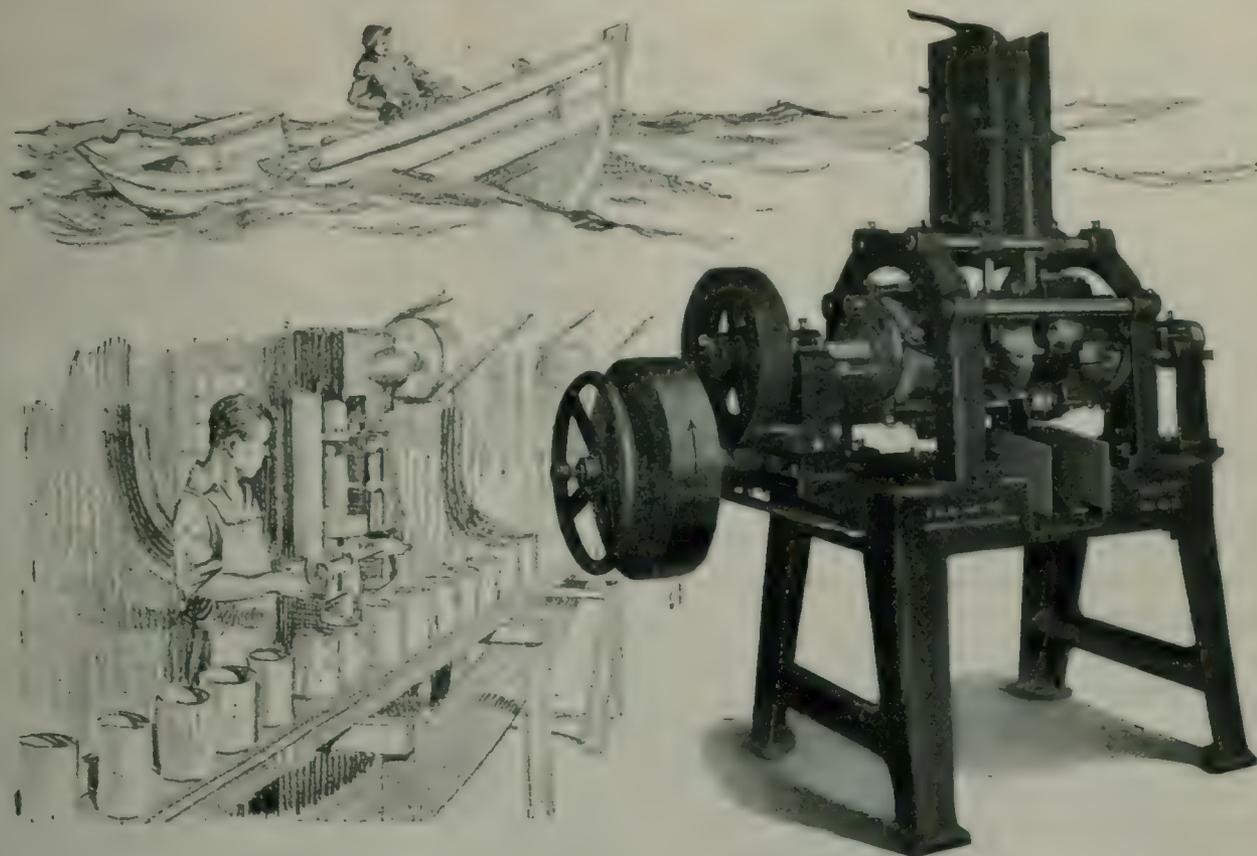
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This machine flanges both ends of can bodies simultaneously and is entirely automatic and continuous in operation. It produces flanges on 100 to 150 cans per minute and can be readily adjusted from one size to another.

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Canada's Fisheries for August, 1917

Summary of the Quantities and Values of all Sea Fish caught and landed in a Fresh or Green State; and an estimate of the Quantities Marketed, or intended to be marketed, fresh, dried, pickled, canned, etc., in the WHOLE OF CANADA, for the MONTH of AUGUST, 1917.

Totals for the Month of AUGUST, 1916.

Kinds of Fish.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.	Caught and Landed in a Fresh or Green State.		Proportion used Fresh, Dried, Pickled, Canned, etc.
	Quantity.	Value.		Quantity.	Value.	
SALMON, cwts.	357,710	1,812,503	.....	300,756	1,355,501	.....
Do., used fresh (or frozen) cwts.	11,921	.....	.....	9,097
Do., canned, cases.	411,345	.....	.....	347,054
Do., smoked, 'cwts.	82	.....	.....	30
Do., salted (dry) cwts.	77	.....	.....	6
Do., mild cured, cwts.	4	.....	.....	51
Do., pickled, cwts.	12	.....	.....	.....
LOBSTERS, cwts.	44,891	213,469	.....	13,465	60,680	.....
Do., canned, cases.	22,059	.....	.....	6,632
Do., shipped in shell. cwts.	769	.....	.....	200
COD, cwts.	283,526	717,827	.....	190,519	358,615	.....
Do., used fresh, cwts.	17,545	.....	.....	8,133
Do., green-salted, cwts.	51,673	.....	.....	29,223
Do., smoked fillets. cwts.	236
Do., dried, cwts.	54,264	.....	.....	41,073
BLACK COD, cwts.	8,042	42,684	.....	4,020	18,750	.....
Do., used fresh, cwts.	6,656	.....	.....	3,434
Do., smoked, cwts.	592	.....	.....	293
Do., green-salted, cwts.	96	.....	.....	.....
HADDOCK, cwts.	59,380	153,403	.....	47,666	76,573	.....
Do., used fresh, cwts.	15,429	.....	.....	7,617
Do., canned, cases.	2,760	.....	.....	3,701
Do., smoked, cwts.	1,324	.....	.....	1,853
Do., green-salted, cwts.	2,410	.....	.....	359
Do., dried, cwts.	10,689	.....	.....	9,901
HAKE AND CUSK, cwts.	81,739	128,623	.....	99,502	98,522	.....
Do., used fresh, cwts.	3,727	.....	.....	4,598
Do., green-salted, cwts.	4,447	.....	.....	11,071
Do., smoked, cwts.	120	.....	.....	.....
Do., dried, cwts.	22,957	.....	.....	24,251
POLLOCK, cwts.	37,965	67,671	.....	21,432	24,189	.....
Do., used fresh, cwts.	1,820	.....	.....	1,438
Do., green-salted, cwts.	1,977	.....	.....	29
Do., smoked fillets, cwts.	210	.....	.....	.....
Do., dried, cwts.	10,519	.....	.....	6,639
HERRING, cwts.	95,009	136,684	.....	187,766	167,954	.....
Do., used fresh, cwts.	6,504	.....	.....	21,299
Do., canned, cases.	1,260	.....	.....	2,355
Do., smoked, cwts.	2,984	.....	.....	19,142
Do., dry-salted, cwts.	160
Do., pickled, brls.	16,629	.....	.....	9,533
Do., used as bait, brls.	15,876	.....	.....	48,826
Do., used as fertilizer, brls.
MACKEREL, cwts.	10,385	52,375	.....	20,504	87,811	.....
Do., used fresh, cwts.	5,702	.....	.....	5,388
Do., canned, cases.
Do., salted, brls.	1,560	5,038
SHAD, cwts.	268	3,154	446	3,945
Do., used fresh, cwts.	250	338
Do., salted, brls.	6	36

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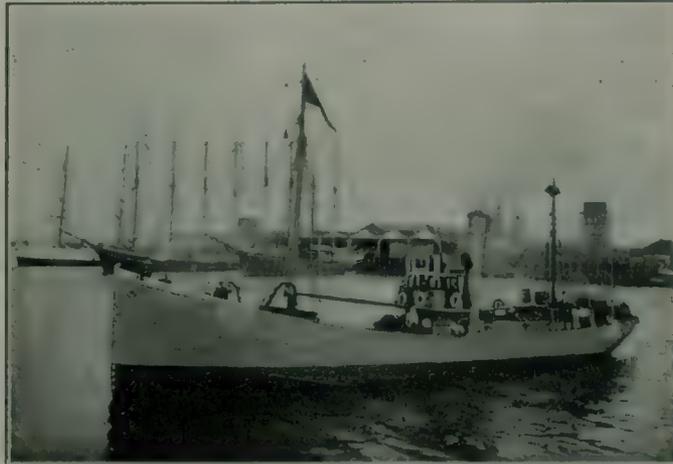
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Cured Herring.*

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ALEWIVES, cwts.	36	78	67	75
Do., used fresh, cwts.	6	8
Do., salted, brls.	10	19
SARDINES, brls.	67,110	283,171	57,927	114,054
Do., canned, cases. . . . .	.....	.....	23,668	.....	.....	26,237
Do., sold fresh and salted, brls. . . . .	.....	.....	61,794	.....	.....	52,680
HALIBUT, cwts.	31,361	309,167	38,410	215,969	.....	.....
Do., used fresh, cwts. . . . .	.....	.....	31,339	.....	.....	38,410
Do., smoked, cwts. . . . .	.....	.....	11	.....	.....	.....
SOLES, cwts.	80	322	80	139	660	139
FLOUNDERS, cwts.	481	873	481	320	430	320
SKATE, cwts.	701	1,347	701	147	173	147
SMELTS, cwts.	117	1,090	117	409	1,611	409
OULACHONS, cwts. . . . .	.....	.....	.....	.....	.....	.....
WHITING, cwts. . . . .	.....	.....	.....	.....	.....	.....
TOM COD, cwts. . . . .	.....	.....	.....	5	10	5
OCTOPUS, cwts. . . . .	.....	.....	.....	.....	.....	.....
SWORDFISH, cwts.	2,896	16,450	2,896	3,484	18,955	3,484
ALBACORE, cwts.	3,715	16,158	3,715	1,879	5,823	1,879
OYSTERS, brls. . . . .	.....	.....	.....	.....	.....	.....
CLAMS, brls.	2,620	4,562	.....	3,159	4,972	.....
Do., used fresh, brls. . . . .	.....	.....	1,718	.....	.....	2,263
Do., canned, cases. . . . .	.....	.....	902	.....	.....	896
SCALLOPS, brls.	300	1,200	.....	2,200	5,500	.....
Do., shelled, gals. . . . .	.....	.....	600	.....	.....	4,400
QUAHAUGS, (sold fresh), brls. . . . .	.....	.....	.....	.....	.....	.....
CRABS, COCKLES, etc., cwts.	1,088	2,895	548	1,425	3,256	716
WINKLES, cwts. . . . .	.....	.....	.....	.....	.....	.....
SHRIMPS, cwts. . . . .	.....	.....	.....	.....	.....	.....
SQUID, (bait fish), brls.	940	2,699	940	1,153	5,524	1,153
LAUNCE (bait fish), brls.	3	24	3	.....	.....	.....
TOTAL VALUE.		3,968,429			2,629,552	

FISH VS. MEAT.

The Eat-Fish campaign of the Government which has been conducted so vigorously for the past few months has had the effect such free advertising might be expected to bring about. Formerly fish was cheap and palatable. It is palatable now, but it is no longer cheap. It seems not unlikely that unscrupulous and avaricious fish dealers may over-reach themselves. As long as fish remained cheap and in good supply it was quite possible to induce people to eat more of it and less of the high priced meats. But when fish quotations soar to a scale about on a par with meat it is a pretty good bet that the ultimate consumer will return to his meat dinner. The Fishing Gazette sizes up the situation in this manner:—

"If, indeed, fish has come into its own as a result of the high prices of other foodstuffs, a cursory glance at the prices of salt and prepared fish would make it appear that the triumph is doomed to be short-lived. The economic question that arises is whether fish will hold its own with competing food products if it is priced as high. Many believe that it will not. Should fish, whether preserved or canned, become a burden to consumers because of its price, it would soon be relegated to innocuous desuetude."—Portland Evening Express and Advertiser.

SPANISH FISHERIES.

A report from a foreign Consul at Madrid states that about 80,000 persons are engaged in the Spanish fisheries, about 600 steamers, and between 15,000 and 16,000 sailing craft. The total quantity of fish brought ashore, of all kinds, is estimated at 150,000 tons, about half of which is landed in Galicia. The consumption in Spain is estimated at 120,000 tons, or an average of 6 kilogrammes per inhabitant each year, and this is supplemented by a large importation of dried fish. The total value of the fish landed is put at about 60,000,000 pesetas (or francs). There are about 1,396 fish-preserving works: for salting, 760; for "conserving," 418; and for the production of marinated wares, 218. From an American Consular report it appears the importation of dried codfish in 1916 amounted to 34,237 metric tons, of a value of \$4,683,691, as compared with 43,528 metric tons and \$5,954,625 in 1915. From another source it appears that the import in May of this year was 400,000 kilogrammes, as against 2,300,000 kilogrammes in 1916 and 2,400,000 kilogrammes in 1915 in the same month; for the five months ended May the import this year was 11,400,000 kilogrammes, as against 14,400,000 last year and 20,200,000 kilogrammes in 1915.

THE CANADIAN FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV

MONTREAL, NOVEMBER, 1917

No. 11



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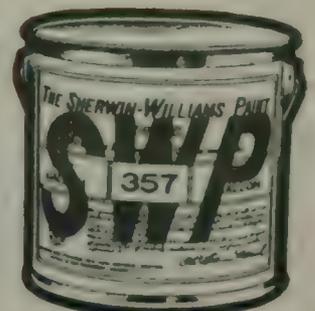
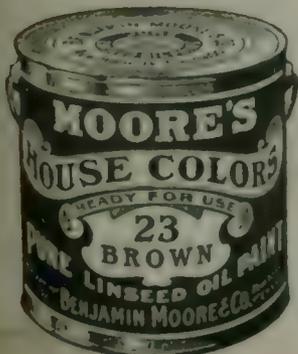
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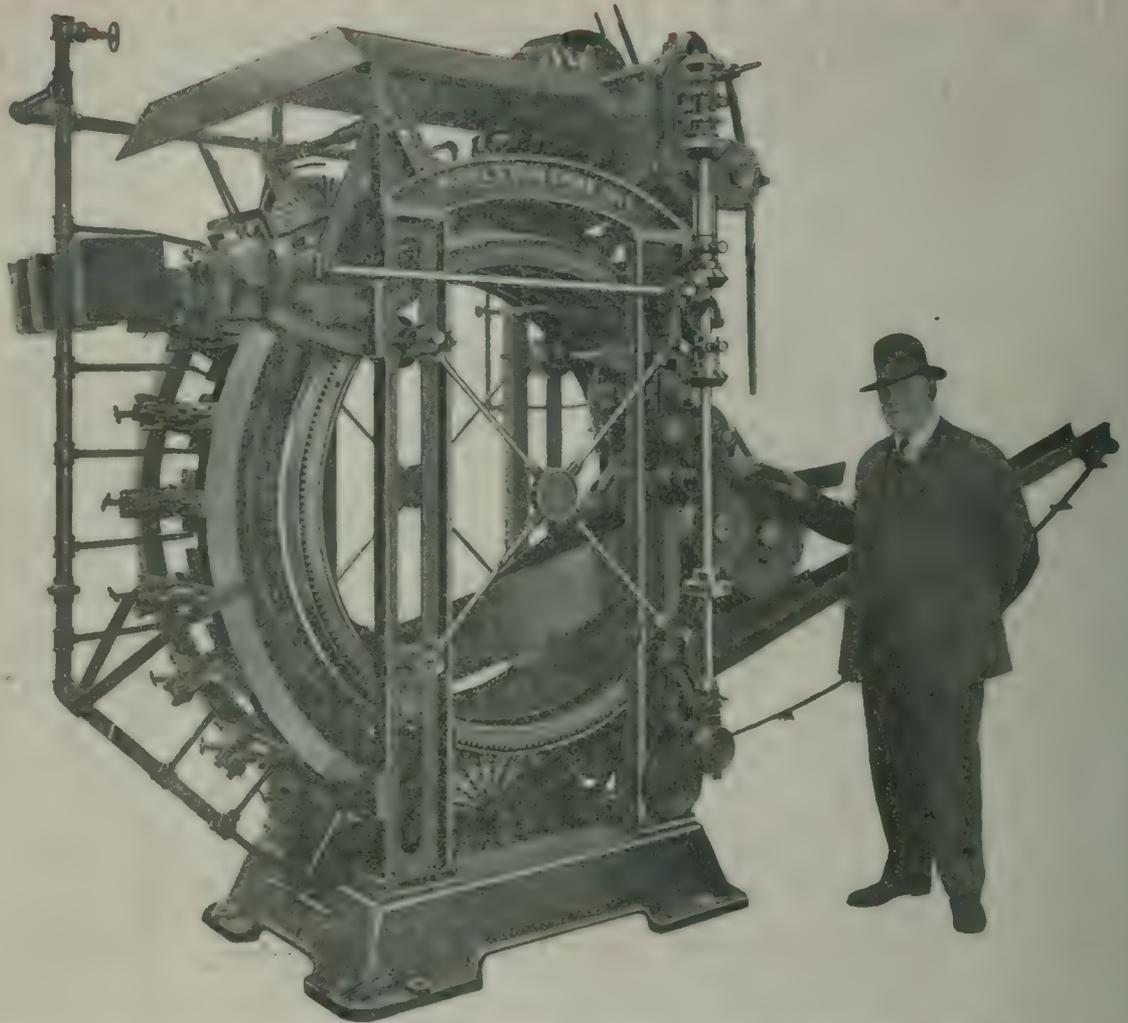
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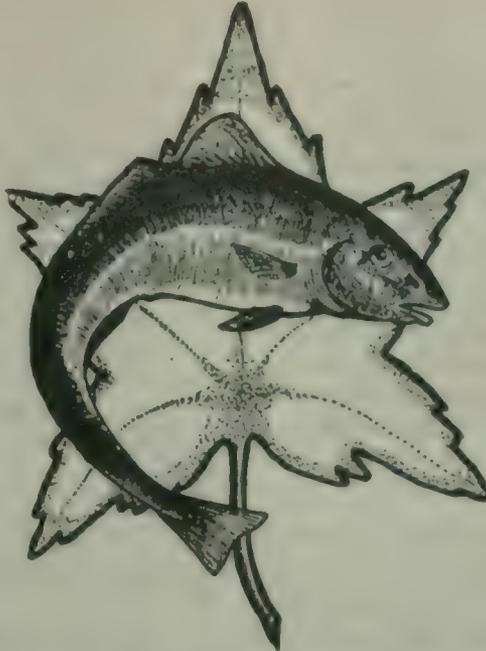
F. WILLIAM WALLACE
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The Industrial & Educational
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Official Organ of the Canadian Fisheries Association

Vol. IV.

MONTREAL, NOVEMBER, 1917

No. 11

AN S.O.S. CALL FROM ONTARIO FISHERMEN.

Unable to make a presentable showing in an effort to produce fish from the virgin waters of Lake Nipigon, the Province of Ontario has resorted to the despicable expediency of holding up the fishermen of the Province and demanding a portion of their catch at prices below what is being paid in the open market. These fish are then offered for sale in a manner calculated to disorganize and ruin the ordinary business of the fish trade.

The people of Ontario are being led to feel that they are getting cheap government fish, but when the final costs, including the high salaries of the inexperienced officials having charge of the provincial machinery of fish production and fish distribution, are brought down in the government return, it will be found that per pound the fish has cost much more than if they had been procured in the ordinary way. The fish produced by the Ontario Government has cost not less than fifty or sixty cents a pound.

If the Province has money to spend it could be laid out to a much better and more permanent advantage by improving conditions in the fishing industry, calculated to alleviate the hardships of the fisherman and improve his power and cost of production, as has been done for the agriculturists, miner and the manufacturer. Furthermore, if the Province desires to keep down the cost of fish to the consumer, it can

better do this by regulating the price. But there is no justice in using the public revenue, part of which the fishermen provide, to establish a competitive business. This is bad enough, but when the Province resorts to the practice of demanding part of the fisherman's catch, at its own price, it deserves the censure of all fair-minded citizens. The farmer, the miner and the manufacturer would not submit to such tyranny, and we believe they will not stand by and see it practised on their weaker fellow citizen.

If the Ontario Government is desirous of increasing the production and consumption of fish in the Province, it could not pursue a course better calculated to defeat these aims than the one it is now following. A discontented and disorganized industry does not make for increased production, and it is a known fact that the consumption of fish in the Province is less to-day than before government fish came onto the market. With the expensive preparations that have been made by the Province to fish Lake Nipigon, only a few tons have been produced, and the people who have been led by announcements to look for this fish are being disappointed. When the consumer asks for cheap government fish and is told by the dealer that he has not been able to get the supplies promised, she feels that she has been deceived by the dealer, and goes away without making a purchase from the regular stocks which the dealer has to offer. For this rea-

son the people are buying less fish, and hence consuming less.

Since the Ontario Government could not make a success in producing fish during the autumn months—the best time of the year for this business—it realizes that it cannot hope to do even so well during the other months of the year, particularly in the winter, when the hardships of fishing are so great. No doubt it is this situation that has driven the Government to hold up the fishermen for the supplies necessary to make good its promise to the people, justify the lavish expenditure already made and keep employed those who have been engaged to look after this government fish business. We use the term "hold-up" advisedly, because the fishermen are complaining of being compelled by Government officials to produce any contracts they have with private firms, and to break these and undertake to supply a part or all of their catch to the Government, under the threat of having their license cancelled.

In an interview which a deputation from the Canadian Fisheries Association had with the Hon. Mr. McDiarmid, the Minister in charge of the Ontario Government's fish business, the Minister defended the right of the Government to see contracts, and while denying any intention of cancelling licenses, did not seem to be very much exercised over the report that threats of cancellation were being made by Government officials.

If the Ontario Government persists in its present course, a very serious and permanent injury will be done an important industry, and it would appear from the sense of security evinced by the Hon. Mr. McDiarmid, that there is not much likelihood of a change being made, unless the public can be aroused to see that justice is done.

The history of the opening of Lake Nipigon and the entry of the Ontario Government into the fish business would indicate that this step was taken more to make a good position for a political friend than to serve the consumer or increase the production of fish. Shortly after the Ontario Government, at the request of the Food Controller, decided to open Lake Nipigon, a Mr. Geo. H. Rapsey, who is not a fisherman, announced that he had been given the sole right to fish this lake and, from all accounts, was preparing for the work. The fishermen of the province raised a protest against any one person being given the exclusive right of so large a territory as a lake sixty-five miles square, and appealed to the Food Controller, with the result that a few days thereafter the Provincial Government decided to operate the lake itself, and to put Mr. Rapsey in charge of the operations at a salary much higher than an experienced fisherman could be had for.

ELIGIBLE FISHERMEN AND CONSCRIPTION.

It is to be hoped that instructions will be given Exemption Tribunals to exempt fishermen of military age in Class I on condition that they remain at their occupation of fishermen for the duration of the war.

There will be a great number of eligible men in the Fishing Industry, but these men are highly skilled food producers which cannot be replaced, and to conscript them for Military Service overseas would be disastrous to the fisheries. For winter fishing, especially, it takes young men able to stand the hardship of seafaring and fishing in rough, cold weather.

We have suggested elsewhere in this issue that all food producers be conscripted into an army of labor. It is the only fair proposal and we have heard it made by fishermen themselves. It is the only form of National Service that will be effective in fighting the enemy's submarine policy by increasing production.

If fishermen are allowed exemption, they should be sworn in to engage exclusively in fishing for the duration of the War. Just as soon as the exempted man leaves fishing for some other non-essential occupation, he should be liable for Military Service.

THE FOOD CONTROLLER'S FISH COOK BOOK.

Mr. Hanna's office is to be congratulated upon the publication of a small booklet of simple fish recipes for war-time meals. The fish chosen are of the cheapest varieties and the menus are economical and readily prepared.

The booklet makes no pretensions to be either handsome or expensively gotten up. There is no art paper or elaborate illustrations, but in its khaki cover, it is as effective as the boys at the front in doing its bit to beat the Hun.

Copies in English and French can be had from the Food Controller, Ottawa.

FISHERY OFFICIALS TO BE CIVIL SERVANTS.

One of the most pleasing actions to be taken by the new Union Government is in the matter of Civil Service Reform. Under the new plan, all appointees to the "outside services" will have to qualify for their positions by examination and will be employed according to their fitness and not according to the number of votes they can secure.

This especially applies to the Fisheries administration. Politics has been its curse. Fishery Overseers, hatchery officers, and others have received their appointments through political influence and qualifications have been overlooked and ignored. The results are only too apparent in the slow development of the Industry and the lack of any evidence of progress.

The bona-fide Civil Servants of the Fisheries Department may be progressive enough, but the tools they have to work with have been foisted on to them, willy-nilly, by the professional politicians who are helped into Parliament to secure jobs for their friends.

Most of these political job seekers are worthless. If they were any good, they would have struck out for themselves and scorned being pulled into a Government Arcadia through political patronage.

Canada can produce plenty of clever men learned in ichthyology and piscatorial science whose services have been refused because they had no "pull." These men will get a chance now, and their employment will materially assist the Industry.

The Fisheries Department is not any worse than other administrations. Political patronage has been the curse of our Government for years. Thank Heavens! the dead wood is going to be cut out now, and efficiency encouraged.

A REVOLUTION IN NEWFOUNDLAND FISHERIES.

Newfoundland is to be a factor in the fresh fish industry. To those who are acquainted with the main business of the Island Colony, this is a momentous announcement. For centuries, the codfish of Newfoundland and Labrador has never been marketed in anything but a salted and dried state, and Newfoundland salt codfish is famous all over the world.

Newfoundland owes her new development to the War, the Reid-Newfoundland Company, and that Kerensky of the fish business—Major Hugh Greene. In response to the great demand for cheap frozen fish in England, Major Greene suggested to the Reid Company that they build cold storages in the colony for the fresh fish trade.

The main storage at St. John's is nearing completion and will be capable of storing 20,000,000 pounds of fish, and of freezing 250,000 pounds per day. Smaller storages will be built at various fishing ports and the fish shipped from them to St. John's or Port aux Basques in refrigerator cars on the Reid railway. Several of the Reid steamers will be fitted with refrigeration chambers for carrying fish from the out-ports not served by the railroad, and for transporting the cargoes to Sydney, N.S., Halifax and Boston.

The value of the enterprise lies not alone in the cod which will be shipped, but it will be the means of marketing for the Newfoundland fishermen species formerly thrown away. Halibut, salmon, haddock, flounders, sole, turbot, skate, etc., will find a ready market, and Old Newfoundland and her fishermen should prosper.

THE USE OF FISH. — A NATIONAL DUTY.

A great many people are obsessed with the idea that the duties of the Food Controller is to lower the cost of foodstuffs—to 'control' prices. This is an entirely wrong conception of the Food Controller's duties, and much of this may be blamed on the inadequacy and ambiguity of the title. Food conserver, or food administrator would be a better word.

In Great Britain, France and Italy, food controller would be correct as these countries are very much in the nature of the besieged nations, and a scarcity of food stuffs and the difficulty of procuring supplies render it necessary that both consumption and price be controlled.

In Canada, we are in no danger of starvation. We are not dependent upon other nations for our staple food stuffs, as are the Allies. Our status is that of a food producing country and events have now placed us and the United States in the position whereby the Allies must look to us for their flour, beef and bacon.

To procure sufficient supplies of these articles, the Canadian food controller, so-called, promulgated beefless days, and enjoined the people to eat less white bread in order that present supplies may be conserved for export. Plans have been made to greatly increase production, and these two policies, conservation and production are the principal features of Mr. Hanna's work.

In order that beef and bacon may be conserved, the food controller suggested that more fish be eaten as the only flesh substitute we have in abundance that can speed up production and increase facilities for distribution. Since fish foods have come to the fore, the universal complaint seems to be that fish is dear in price and that same ought to be regulated by the food controller.

The general public is very liable to come to conclusions through superficial examinations. They work upon the belief that fish costs nothing to produce and that exorbitant profits are made by all engaged in handling it. They expect to get fish cheap and are imbued with the idea that the food controller suggested fish as a substitute for meat because of its cheapness.

This is an absolutely wrong conception. Fish is the only flesh substitute we have in abundance that can adequately take the place of meat, and even if its cost is high, or higher, than the latter, it is the patriotic duty of every Canadian to eat fish and release the beef and bacon in the country for those who need it more than we do.

Canadians are suffering no war hardships in comparison with the people of France, Belgium, Serbia, Great Britain and other European countries. Wages are higher than they ever were before, and prosperity is general throughout Canada, but the public, in spite of these facts, have become critical and whining — arrogating to themselves a species of martyrdom, which is infinitesimal in comparison with that of the millions in the belligerent areas.

Until the public believe more in the efforts of those officials who are devoting their whole time to Win-the-War problems; until they rigidly conform to the requirements of the food administration and refrain from carping and unjustifiable criticism of their re-

commendations, the speedy ending of the tremendous fight we are making against a powerful and resourceful enemy will be postponed to drag on and on into a period when general exhaustion and misery will call a halt and force us into an inconclusive and ignominious peace.

GILL NETTING IN SALT WATER.

There is quite a gill-netting fleet of steamers operating out of Gloucester, and it seems to be quite a successful method of fishing. Last week, one steamer's crew shared \$521 apiece within two weeks. It is said that gill-netting in salt water was introduced by fishermen from the Great Lakes. What's to hinder some of our fishing firms taking the method up? Arrangements could be made with some Canadian tug outfits to bring the boats to the coast before the close of navigation and try it out this winter. There are gill net tugs of the larger type on Lake Erie which should be suitable for the work in moderate weather at sea. It would be better to keep them employed, if possible, than have them laid up all winter in the Lake ports. If it can be done in Gloucester, it can be done here.

PRESERVING THE PACIFIC HALIBUT.

In this issue we are publishing an article by William F. Thompson on the regulation of the halibut fishery of the Pacific. The investigations on this subject were conducted under the auspices of the Provincial Fisheries Department of British Columbia—a Department which has produced some of the best and most useful Fishery Reports in Canada, and, in their halibut and salmon reports, among the most important fishery publications extant.

Thompson is a young man who has specialized in the halibut. From the scholastic atmosphere of Leland Stanford University, he packed his kit and scientific instruments aboard the halibutters out of Vancouver and Prince Rupert and voyaged to the Hecate Straits and Gulf of Alaska "banks" and put in months of careful, painstaking observations. He kept plugging away at his objective in spite of seasickness, rough quarters and the rude, though harmless, pleasantries of his shipmates, the fishermen. Though they jollied the young scientist in his work, yet he was always on deck when the fishing was on, measuring the halibut and deftly extracting their ear-bones or "ootoliths" for age determinations.

A fishing vessel is a poor place for the man of science, but Thompson stuck it out, and brought back information never before published.

In his article in this issue, Mr. Thompson makes tentative suggestions for the regulation of the halibut fishery before it is absolutely depleted. Briefly, he proposes to divide the banks into six areas from the Oregon Banks to the inner Behring Sea — the said areas being open and closed alternately for a period

of years to be determined and regulated by International agreement.

While this seems to be the most feasible means of preserving the halibut and at the same time keeping the halibut fleet and fishermen employed, the big task will be to keep the closed parallels properly policed. Poaching is bound to occur — not that fishermen are dishonest or anxious to break the law — but the spirit of adventure, of "taking a chance," is strong within them. It is not hard to imagine a vessel homeward-bound with a "skunk" trip and crossing a forbidden area rounding up and stringing out her gear for the halibut in the sanctuary below. And in such an enormous area, this is going to be hard to prevent — especially in foggy weather when the skipper can swear he never had an observation for latitude in days.

Seal poaching in the North Pacific went on merrily years ago, and it was only wiped out when the sealing fleet was wiped out by International Congress. Still, if the fines were heavy enough and involving seizure and confiscation of vessel and gear, it is possible to keep the closed areas free from poaching, but the banks will have to be well patrolled.

This may be done outside the regular Fishery Patrol Service, if we had a Naval Reserve with a small fleet of auxiliary vessels for training purposes. These craft, on their training cruises, could very well act as patrols all the year round, and do the policing which would be too heavy a burden on the regular Fishery Patrol.

The sea is very wide. A vessel is below the horizon ten miles off. There is no chalk line or stakes to mark the limits. Sun and lead are practically the only guides to position, and neither are certain, and over a thousand miles of latitude is not going to be patrolled by two or three fishery cruisers. Some will obey the law, but there are others that will take the risk, and give the latter two days on a small halibut patch uninterrupted, there won't be much preservation.

NEW DEVELOPMENT OF PACIFIC FISHERIES.

Halibut and salmon—kings of the Pacific fisheries—are going to find rivals in the various cods and flat-fishes (other than halibut) now being marketed.

The Government are assisting in the marketing of these fish in inland centres as far east as Winnipeg by a rebate of two-thirds of the TRANSPORTATION charges—freight or express, and the Food Controller's Office are making arrangements with the fishermen and the producers on the Coast to have the fish retailed to the consumer around 10 cents per pound.

The arrangements with the fishermen are to be International in order that there will be competitive bidding on either side of the line to raise the price. It is expected that the Deep Sea Fishermen's Union will agree to a price of from 1¼ to 2 cents per lb. for a term of years to establish a market, provided that profits are cut down all along the line by all handlers.

Mr. Joseph Maddock, of the Glacier Fish Company, Tacoma, is representing the U. S. fish producers in the negotiations, while Mr. A. L. Hager, Second Vice-President of the Canadian Fisheries Association, Vancouver, will speak for the Canadian fish men. Mr. John P. Backeock, Assistant Commissioner of Fisheries of B. C. is acting for the Canadian Food Controller.

In addition to supplying a war time necessity of cheap sea fish for Western consumers, the scheme will be of the greatest benefit to Pacific fish men in creating a market to replace the decreasing supply of halibut. The Pacific men urge that the transportation rebate be extended to cover every class of edible Pacific fish, other than salmon and halibut, and that centres 25 miles from tide-water be allowed the subsidy.

A cook book, giving recipes on preparing the new species of fish, will be published and distributed to consumers throughout the West and special efforts will be made by dealers and others to popularize the new sea-foods.

LINEN TWINE FOR NETS AFFECTED BY WAR.

The lake and river fishermen using gill-nets are up against a famine of linen twine, and nets made of this fibre are fable to be scarce and high in price before long unless greater supplies of flax come from Great Britain.

The enormous quantities of linen used for airplane wings in Great Britain and the United States is accountable for the shortage, and in the pursuits of war, the pursuits of peace must suffer.

Of course, we have a substitute in cotton, but cotton nets will not stand the wear and tear of linen—though it is possible to treat it with some dressing that will prolong their use and prevent rot.

Many things used in the fishing industry have risen in price through the war, but a slight advance in the price of fish seems to be regarded as a crime by the general public.

CONSCRIPTION FOR THE FISHERIES.

The vast importance of the fisheries to Canada and the Empire at the present time calls urgently for greater production. With Great Britain, the United States and the home market demanding all that can be produced, and with Food Controllers Hanna and Hoover insisting that more fish be used in order that meat be released for overseas, it is imperative that the producing end of the fishing industry be marshalled as an efficiency working force to keep up production.

With men being conscripted for the fighting overseas, it is only fair that men be conscripted for labour at home — essential labour in the production of food-stuffs and munitions. Dealing with our Canadian fishing industry, a start should be made now and the National Service Board could very well be given an

opportunity to justify its existence.

Fishermen should be enrolled into an army of food producers, but along lines most essential to the needs of the country. The salmon fishermen of British Columbia could be drafted into the shore and deep sea fishery for halibut, cod, flounder, herring, etc., until the canning season opens again. The lobster fishermen of the Maritime provinces and the Lunenburg salt fishermen can readily be kept fishing in other branches, while the Great Lakes men, not fishing through the ice, could be sent to the Northern Lakes or down to the sea coast.

We venture to predict that there would be no protest from the fishermen. If it was pointed out to them that by "carrying on" their work along the lines required of them they were doing their bit, they would turn to willingly in the interests of the National Service. It remains for the National Service Board to get busy NOW and do something to win the war at home, while others are winning it for us overseas.

HALIBUT AND SALMON — LUXURIES!

When we refer to the above fish, we cannot acclaim fish as being cheaper than meat. Retailers are grumbling at the price they have to pay for these fish. Consumers are writing to the papers about it, and the butcher — oft cursed for the high price of meat — points gleefully to halibut and salmon and expounds upon the high cost of fish.

In Montreal, the consumer is paying from 35c to 38c for fresh Pacific halibut. On the Coast the producers have paid as high as 63 cents apiece for Dog Salmon — worthless a few years ago — and salmon of all varieties have reached hitherto unheard of prices. Truly, both fish are in the "lordly, aristocratic class" and will soon be confined to the tables of the rich.

In an interview to the Vancouver Sun, Mr. A. L. Hager, Vice-President of the C. F. A., and Manager of the Canadian Fishing Company, Ltd., Vancouver, sums up the situation as follows:—

"Our tonnage is much below last year, both for fresh fish and frozen, in fact, considerably less than in any previous year. This is to be attributed to the scarcity of fish and the scarcity of labor. There are lots of orders in sight, export orders, but we cannot begin to touch them. In the first place, the price offered is too low, and apart from that we cannot get enough fish for the export trade. We are not getting enough fish for our Canadian and American trade.

"Both halibut and salmon are in the luxury class. I cannot say what price halibut is retailing for back east; I suppose any price can be asked for it, but it is surely very high right here. Halibut has been selling around 16 to 20 cents a pound, and went as high as 30 cents for a little while. This is compared with five

and six cents a pound three or four years ago. Just two years ago it was selling at eight cents a pound, and that was a good price.

"Take salmon again. Here we are today having paid as high as 63 cents for dog salmon the cheapest grade of salmon, getting close to what I might call the world's record for sockeye at 70 cents."

"But the harvest is the fisherman's and not that of the fishing and distributing companies, Mr. Hager points out. The huge price for salmon is attributed to the bidding of the American buyers and the Japanese fishing fraternity being well organized, and Mr. Hager does not question in the least that numbers of Japanese fishing brokers, and even fishermen, are able to winter in Japan off their gains this season.

"The halibut fishermen are also enjoying remarkable winnings by their percentage of the market price of the fish the deep-sea boats bring in. For the halibut fishermen to make \$400 and \$500 for a two-week's stay on the fishing grounds has been no exception this summer."

A CORRECTION.

In our September issue there occurred on page 430 an expression which might lead our readers to believe that the Leonard Fisheries owed their origin to the North Atlantic Fisheries. This, of course, is not correct. The Leonard Fisheries, Ltd., are successors to the businesses of three old, well established firms, viz., Leonard Brothers, Ltd., of Montreal, Que., and St. John, N.B.; Mathews and Scott, Canso, N.S., and A. Wilson & Son, Halifax, N.S. In the course of the extension of its business the Leonard Fisheries, Ltd., purchased the large cold storage plant at Port Hawkesbury, N.S., which at one time belonged to the North Atlantic Fisheries, Ltd.

FOOD CONTROLLER'S MAXIMUM PRICES.

Maximum prices to be paid to fishermen in the Provinces of Manitoba, Alberta and Saskatchewan for winter-caught fish have been fixed by the Food Controller. The profit of the "Producing Companies" who buy from the fishermen and sell to the wholesale houses, has been limited to a maximum of 1 per cent per pound, while the profit of the wholesale houses on sales to retail dealers must not be more than 2 cents per pound. In this way, the price charged for such fish to the retail dealers in any part of Western Canada must not exceed by more than 3 cents the price actually paid to the fishermen, plus transportation charges from the primary rail shipping point. While the Food Controller has not fixed the price to the consumers, this may be done by the several municipalities which are co-operating with the Fish Committee of the Food Controller's office.

Persons dealing in Western winter-caught fish in quantity will be required to secure a license from the Food Controller. Heavy penalties are provided for failure to register and take out such license or for failure to comply with the Food Controller's regulations. Deliberate waste of fish will be penalized. Wholesale dealers must give first consideration to the needs of the Canadian market. By this means it is hoped to ensure for the people of Western Canada an adequate supply of fresh fish at fair prices, and thus to

release for export overseas a very large quantity of beef and bacon.

The announcement to this effect follows a meeting between the Fish Committee of the Food Controller's office and representatives of the Western fishing industry. A conference was also held between representatives of the Food Controller for Canada and the United States Food Administration at which the international questions involved were considered and an agreement reached.

Following are the maximum prices which may be paid to fishermen for Western winter-caught fish until further notice at the shipping points, named, f.o.b. railway track in each case:

	Lake Winnipeg and District.	Lake Manitoba and District.	Lake Winnipegosis and District.	Pas District.	Big River Dist.	Alberta Lakes.
Lake Trout and Whitefish, Round	8	8	—	—	—	—
Do., Dressed	—	—	7½	7	7	6½
Pickarel and Perch, Yellows	7½	7½	7½	7	7	6½
Jackfish, Round	4½	4½	4½	4	4	3½
Do., Dressed	5	5	5	4½	4½	4
Tullibees, Round	5	4	4	4	4	3½
Goldeyes, Round	3	—	3	3	—	—

In making the announcement Mr. Hanna stated that the Fish Committee had considered a number of alternatives. "The course which has been adapted," he said, "ensures that the consumer who uses the fish in the fresh state will be able to purchase it at a reasonable price. The amount which he has to pay will be regulated by the price actually paid to the fishermen. In this way both the fishermen and the public will be protected against excessive profits to the middlemen."

THE PAS FISHERIES TO BE AIDED.

The threatened tie-up of the winter fishery along the line of the Hudson Bay Railway will be relieved by the action of the Government who have arranged with the contractor for a service twice a week to bring winter caught fish into the Pas.

It is estimated that between 70 and 80 cars of whitefish, yellows and jacks will be shipped over the line this winter.

TO WHOLESALE FISH DEALERS.

Don't forget to register with the Food Controller. Neglect incurs a heavy penalty.

The Armstrong Independent Fisheries is the name of a new fishing company formed in Manitoba to deal in Western lake fish. Hon. Hugh Armstrong, of Portage la Prairie, is president of the new company.

It is reported that Gloucester firms have purchased almost the whole of the Cape Breton salt fish catch. The stock this season in Cape Breton is said to be the biggest in years which looks as if the fishermen have been paying heed to our Increase Fish Production campaign.

WHOLESALE DEALERS OF FISH TO BE LICENSED.

By order of the Food Controller, wholesale dealers in fish of all kinds are required to apply for license to act as such. All dealers must apply for said license before January 1st, 1918.

All wholesale dealers in fish have been required to register with the Food Controller. This regulation has been made public for some time and no excuse will be accepted for non-compliance with the order now.

No licenses will be granted to persons or firms who have not registered. Penalties for non-compliance with these laws are heavy, and we strongly advise all dealers who have omitted to register, to do so immediately. Those who have already registered, should now apply for license. There is no fee required.

EMBARGO ON FISH EXPORTS.

By order of the Food Controller, an embargo has been placed on the export of dried, smoked, cured, prepared, canned and salted fish to the United States and other countries. None of the above products will be allowed to go out of the country unless a permit is granted by the Food Controller's Export Bureau, Ottawa.

Fresh fish in usual quantities can be exported without a permit.

The order went into force on November 17th.

PROVINCIAL FISH COMMITTEES FOOD CONTROLLER'S OFFICE.**British Columbia:—**

John P. Babcock, Asst. Comm'r Fisheries, B. C.
John Wallace, Vancouver.
A. L. Hager, Vancouver.
Ald. O. H. Nelson, Prince Rupert.

Nova Scotia:—

A. E. Jones, Halifax, N. S.
H. R. Silver, Halifax, N. S.
E. C. Whitman, Canso, N. S.

Prince Edward Island:—

W. F. Tidmarsh, Charlottetown.
A. F. McFadyen, Tignish.
Chas. Sterns, Souris.
C. H. B. Longworth, Charlottetown.

Alberta:—

A. A. Craig, Edmonton.
Benj. Lawton.
Walter S. Campbell.

Saskatchewan:—

F. N. Darke, Regina.
F. H. Auld, Regina.
P. McElmoyle, Regina.

EXTENSION OF FISHING SEASON IN B. C. LAKES

In order that more fish foods may be produced this Fall from the B. C. lakes, the Provincial Fish Committee of the Food Controller's Office recommended that the net fishing season in the Okanagan, Arrow and Kootenay lakes be extended until Dec. 31st.

An Order-in-Council has been passed on Nov. 3 by the Federal Fisheries Department extending the season as requested.

A considerable quantity of red fish will thus be marketed.

OBITUARY.

It is with feelings of the deepest regret that we announce the death of D. N. McIntyre of Vancouver, B. C., who was instantly killed in France while serving as a lieutenant in the 16th Scottish Canadians of British Columbia.

Lieut. McIntyre was, until little over a year ago, Deputy Commissioner of Fisheries for British Columbia. He was born in Napanee, Ont., and was a graduate of Queen's University, Kingston. He entered journalism and was for a time with the Montreal Star—latterly going out to the coast as news editor of the Victoria Colonist. From the editorial desk he went to the B.C. Fisheries Department and filled the office of Deputy Commissioner of Fisheries for a number of years.

"Mac", as he was familiarly known, was a good fellow in every sense of the term and was well liked by all who came in touch with him — officially or otherwise. Our sincerest sympathies are extended to his wife and two children resident in Vancouver.

AMERICAN STEAM TRAWLERS BREAKING RECORDS.

The new steam trawlers "Walrus" and "Seal" landed trips of 300,000 lbs. each at Boston on November 5th — stocking something like \$15,000 apiece. The "Walrus" landed 75,000 haddock, 150,000 cod, 75,000 scrod. The "Seal" landed 120,000 haddock, 120,000 cod, 10,000 pollock, 50,000 scrod. The former vessel is commanded by Capt. Clayton Morrissey—a famous high-line salt bank fisherman in schooners, and the latter by Capt. Lem Spinney—another schooner high-liner. Both men are Nova Scotians. The fish were caught on Western Bank.

For two month's mackerel seining on the schooner "Helen B. Thomas" of Boston, the crew shared \$1,171 apiece. It pays to be fishing these days.

Whalemeat is now coming to the fore as food on the Pacific Coast, and is being sold in Vancouver at 10 cents per pound. The meat is not unlike moose-meat and has no fishy or oily taste — in fact it is as palatable as ordinary beef. In California, where it has been used for some time, whalemeat is used in restaurants for making Hamburger steaks. At the whaling stations, the meat is cut out in great square blocks, frozen hard, and boxed for shipment to market.

Alberton, P. E. I.

To the Editor of

Canadian Fisherman.

Enclosed you will find money order covering renewal of my subscription and three other new subscribers whose names and addresses are on the back of this paper. These men saw my copy and they want to subscribe themselves.

You are certainly putting out a valuable journal which is full of information for a fisherman.

The last week of October has been the best in the history of Alberton — a big run of smelts — and good prices. Some of the buyers were paying as high as 10 cents a pound. Good catches of cod also are coming in. There is a lively time around the wharf.

There was a time when everybody talked Black Fox but every body is talking Fish now.

(Signed) ONLY A FISHERMAN.

The Food Value of Fish

By A. BROOKER KLUGH.

In the past the consumption of fish by the population of Canada has been decidedly limited, but now, urged by the high price of meat and by a patriotic desire to conserve the stock of meat, its use is being considerably extended. It is therefore of interest and of importance to enquire into the matter of the food value of fish. It is useful only to augment a reduced meat ration? Is it to be used only as temporary, war-time substitute for meat? Or is it a food which may, without any danger of mal-nutrition, take the place of meat, not only at the present time but indefinitely?

These questions of vital importance we can only answer by a careful and scientific enquiry into the function of foods and the composition of fish as compared with other foods.

In the first place it is necessary to get a clear idea as to the main constituents of foods. There are three of these — carbohydrates, fats and proteins. By carbohydrates we mean such substances as starch and sugars. By fats we mean not only the animal fats which are usually so termed but also butter and oils. By proteins we mean such substances as the white of eggs, the casein of milk and cheese, or pure lean meat.

The human body requires two things of the food taken into it — energy and material for the manufacture of new cells, that is, material for growth and repair.

Energy is furnished by the carbohydrates and fats, they are, as it were, "burned" in the body and the energy liberated in this process supplies the heat which keeps the body at its proper temperature and the energy which is used up in the action of the muscles. The fats and carbohydrates provide the fuel which keeps the human machine running, but they do not provide the material which repairs that machine, and for this purpose protein is absolutely essential.

Proteins are far more complex-chemical compounds than fats or carbohydrates. And not only are they more complex but they differ far more among themselves than do the other constituents of foods. The manner in which they differ is so fundamental a matter in nutrition that we have to consider it in some detail.

Proteins are made up of combinations of some seventeen different chemical compounds known as amino-acids. Some proteins, known as complete proteins, contain all these amino-acids, while others, the incomplete proteins, lack one or more of these compounds. For the maintenance of the body, and particularly for growth, all the amino-acids are necessary, and for this reason a diet which consists entirely of incomplete proteins will not maintain the body in its proper state of repair. On such a diet the body will slowly but surely starve for lack of one or more of the essential amino-acids. Now it is among vegetable foods that we find incomplete proteins to be most common — they are very rare in animal foods, and it is because of this fact that some animal protein must be included in our menu. We may derive all our carbo-

hydrates, and even all our fats, from plant products, and we may derive two-thirds of our protein from vegetable fare, but further than this it is unsafe to go—we must obtain the remaining third of our protein from animal products.

From the above discussion we can readily see that the greater the content of protein in an animal food the more valuable that food is to the body.

Now let us investigate the protein content of different kinds of fish and compare them in this respect with other animal foods high in protein, such as various kinds of meats, eggs, and cheese.

Taking some of the common food-fishes we find that in the fresh, uncooked, condition the amounts of protein are as follows:—

Whitefish	22.2%
Cod steaks	18.1%
Halibut steaks	18 %
Mackerel	18.1%
Lake Trout	17.3%
Haddock	16.7%

Now turning to meats we find that the protein content of uncooked meats are as follows:—

Beef, round steak	20.7%
Beef, loin	19.1%
Beef, ribs	17 %
Beef, rump	16.9%
Veal, cutlets	19.7%
Veal, ribs	20.1%
Mutton, leg	17.9%
Mutton, shoulder	17.2%
Mutton, neck	16.4%
Mutton, loin	15.5%
Lamb, leg	18.6%
Lamb, shoulder	17.6%
Lamb, neck	17.2%
Lamb, loin	18.1%
Pork, ribs	16.8%
Pork, loin	16.1%
Pork, shoulder	12.9%
Pork, side	8.8%

Comparing these two lists we see that, fish compares very well with meet in protein content and if we average the percentages for fish and meat we find that the average for meat is 17.1% and that for fish is 18.4%, and this in spite of the fact that we have included all the prime cuts of meats in our list.

The protein content of eggs is 13%, that of milk is 3.2%, and of cheese 25.1%, so that cheese is the only food which compares favorably with fish in the amount of protein, and since it is not a raw material but a finished product it would be more correct to compare it with either cured or canned fish than with raw fish.

The percentage of protein in cured fish is as follows:—

Smoked Herring	35.8%
Salt Boneless Cod	24.9%
Smoked Halibut	20.1%

These values compare well with that of cheese and also with that of Dried Smoked Beef which has protein content of 29.1%.

Turning to canned fish we find that Canned Salmon has 21.1% of protein and Sardines 22.3%.

So far we have been concerned only with the percentage of protein in the various foods which we have compared, without reference to price. Now let us see how they compare with regard to the cost of protein in the form of meat and the form of fish. The clearest way to do this is to give the cost of a pound of protein if bought in the form of the various foods, though we do not eat protein by the pound and in fact a pound of animal protein will provide a man engaged in light work with all the animal protein he requires for twelve days.

The cost of a pound of protein in different meats is as follows:—

Beef, sirloin @ 35c per lb.	\$2.18
Beef, round, @ 30c per lb.	\$1.45
Mutton, leg, @ 32c per lb.	\$2.04
Pork, loin, @ 30c per lb.	\$2.25
Dried Chipped Beef @ 50c per lb.	\$1.90

The cost of a pound of protein in different fish is:—

Cod, steaks @ 12c per lb.	71c.
Haddock, @ 12c per lb.	78c.
Lake Trout, @ 15c per lb.	\$1.10

Halibut, steaks @ 25c per lb.	\$1.57
Canned Salmon, @ 25c per lb.	\$1.24

Averaging these figures we see that the average cost of a pound of protein in the form of meat is \$1.96 while in the form of fish it is but \$1.08, or to put it in another way the cost of protein in the form of fish is only 4/7 its cost in the form of meat.

Considering now the other main foods rich in animal protein we find that the cost of a pound of protein purchased in the form of cheese at thirty cents per pound is \$1.00, in the form of milk at nine cents per quart it is \$1.36 and in the form of eggs at sixty cents per dozen it is \$2.40. So here again cheese is the only food which compares favorably with fish.

There is also a further point which we have to consider in relation to the food value of fish and that is that it is easy of digestion and in this respect it differs very materially from its nearest competitor in food value, namely, cheese, which is not by any means an easy food to digest.

Now that we have examined carefully into the food value of fish we can without any hesitation say that it is a food which should not only very largely replace meat at the present time and thus fulfill the laudable function of conserving the stock of meat, but that it should become a common and constant item on the menu of the Canadian people.

The Regulation of the Halibut Fishery of the Pacific

B. C. Fisheries Report, 1916

By WILLIAM F. THOMPSON.

The Condition of the Banks.

It was made evident in a previous paper (B.C. Fishery Report for 1915) that intense fishing on the halibut banks of the coast of British Columbia and the United States has resulted in not only serious depletion, but has made its influence felt throughout the whole biological appearance of the species, and in doing so has rendered precarious the future of the banks, particularly the older or longer known. The numbers still found on them are so small, and the percentage of mature fish in this population has fallen so low, that it appears imminent that the halibut will drop to a minor position among the food-fishes of the Pacific. It may recede northward, as it did from the shores of Massachusetts and from the coast of England, until it exists only in the more remote and difficult to reach of the banks. It is very difficult to see wherein more proof than is at hand may be adduced to emphasize this tendency, save the final one of the catastrophe of commercial extinction itself.

The rate of decrease shown—over 70 per cent—for each decade is surprisingly large. Yet it must be remembered that the constant shifting to new banks has stayed off a portion of the effects of impoverishment. This extension is, in its way a measure of depletion. Just as a mine may be exhausted and its owners re-

duced to working over the discarded low-grade ore, so may the halibut fleet be compelled to rely on depleted banks. The progress from Cape Flattery to Hecate Strait, and from there to Yakutat and beyond, has been at a constantly accelerated rate as the total catch has grown from year to year. When the end will be reached, perhaps in the Southern Bering Sea, perhaps on the Siberian coast, is, of course, difficult to forecast. In the meantime the expenses of long voyages are gradually growing, and the necessity for vessels of large steaming radius is becoming greater, so that it is a question whether the final reserves of halibut shall be exploited by vessels from our coasts. When expansion is at an end, as will inevitably be, the vessels must return to fishing on the older banks, which will then be depleted beyond their present condition unless measures are taken to allow them to recuperate. They cannot support the fishery now existent, it is very plain, or anything comparable with it.

There are many reasons why this depletion does not evince itself in the prosperity of the fishing business in direct proportion. The rising prices demanded of the consumer and the extension to new banks require no comment on their effects. More important than these, however, is the fact that the time and effort required by the boats to catch the fish is only a portion of that

necessary to carry the fish from the ocean to the consumer, and a seemingly overwhelming increase in the fishing-time of the boats is but a moderate increase in the total. The length of the voyage, as has been shown, does not increase in the same proportion as the actual fishing-time, and the length of the voyage is but a part of the whole journey over ocean and land. In other words, the increased expense of obtaining the fish is distributed between that of transporting and selling, and is felt correspondingly less.

It is evident, therefore, that an automatic abatement of the fishery in direct proportion to the rate of depletion is far from what is to be expected, and those who rest content in the belief that it will not pay commercially to deplete the banks beyond the limit of recuperation are on unsafe grounds.

Remedial Measures.

The reason for the existence of halibut-fishing on

farther north, there should be no great obstacle to the application of adequate measures to the older banks.

In addition to propositions discussed privately, there has been a strong effort to pass a measure designed to meet the urgent need for the protection of the banks. This has resulted in the introduction into the Congress of the United States, and its passage by the Senate, but not by the House, of a Bill (S. 4586), establishing a close season for halibut during the months of December and January, and a nursery of approximately 290 square miles near Hecate and Noyes Islands, Alaska. The enforcement of this was to be dependent on the enactment of similar regulations by the Canadian Government. It was the present author's opinion, as expressed in a previous communication to the Provincial Fisheries Department, that the remedy for the depleted condition of the banks "would be to materially restrict the fishery (1) by stopping fishing en-



The Crew of a Halibut Fishing Vessel.

the older banks when they are apparently partly depleted is seen also in the great seasonal variation in the yield obtained. It is evident from almost all of the data presented that during the winter months the yield falls greatly, but rises to its maximum in summer, during June and July. It is during these best months that it is possible to do profitable fishing on these banks, and that fact keeps a certain number of vessels in the impoverished areas. Notwithstanding this, it is common knowledge that even during the best season it now pays to go to the Far North. It has also been proved that there is an alarming lack of mature fish on the older banks. It must be borne in mind, then, that the vital need of the southern banks, with the exception of those off the coast of Oregon, is protection during that portion of the year when they are yielding their largest proportion of small and immature fish. As the main fishery has shifted to a position

tirely over large areas, such as Hecate Strait; (2) by making a close season of, at the very least, twice the length suggested; or (3) by limiting the number of boats and men employed."

The provisions of the Bill and the above alternatives are here discussed in greater detail, with the exception of the question of limiting the "number of boats and men employed," which cannot be seriously considered in view of the necessarily international aspect of the proposed remedies. Brief comment on an additional means of combating depletion—namely, artificial propagation—is also given.

Artificial Propagation.

The contemplation of experiments in hatching the halibut must lead simply to ill-founded optimism on the part of the fishermen. The hatching of cod and plaice has been carried on by several Governments with results which are local and limited, and have been dis-

puted. These species are much smaller, more easily handled, come to maturity at a smaller size, and the near-ripe fish are obtainable in greater numbers than is the case with the halibut. The later's ova are shed gradually, so that to get quantities of ripe ova it would be necessary to keep fish in breeding enclosures, and, as they reach maturity at a considerable size, this would be difficult and expensive. It is also very doubtful whether, on the long sea voyages of the fishing-boats, enough ripe spawn could be captured to make the attempt profitable. As the number of eggs produced by a female during its lifetime is supposed to be proportional to the difficulties encountered in survival after being laid, the value of such ripe eggs as are obtained from this species would be less than that of those from less "prolific" forms. The number of ova laid in each of the spawning periods of a halibut is about 300,000 when 35 inches long, and 1,600,000 when 56 inches, and there must be about ten such periods in the normal life of a twenty-year-old fish. So the

posed, and in view of the widespread adoption of closed seasons in conserving other species is worthy of careful consideration.

To be worthy of adoption, however, it is imperative that a measure be shown capable of conserving the numbers of the species as a whole or in threatened areas, or adequate to increase the number of spawning fish where it has fallen below the margin of safety. The question in any case is simply one of ensuring the existence of a sufficient number of breeding males and females in those large areas now lacking them.

It is a serious question whether the closed season would not simply result in a more intense fishery during the open portions of the year. It must be remembered that the cold-storage facilities now available render it possible to deliver a supply of halibut all the year round, with or without a close season. There is no question, then, of an interruption of the demand from the consumer, with a consequent lessening of the total called for; and there is, as we shall see, every



A Halibut Fishing Vessel.

value of hatched eggs cannot be great unless the resultant young are carried through more of the precarious stages than is usual, or possible without great expense. Hence, in the face of the wholesale reduction in numbers of halibut on the banks, the establishment of hatcheries cannot be regarded as anything but exceedingly expensive experimental work. Its results, unlikely as they are to be of value, could not be known for many years, and those years might mean the ruin of the industry if action were delayed pending the arrival at a conclusion.

Close Season.

Recognizing the urgency of the situation, there has been, among fishermen and dealers, a strong sentiment in favor of the imposition of a close season of two months, December and January. This has been perhaps the most widely approved measure of any pro-

reason to believe that this demand will be satisfied, whether there is a close season or not.

Catches of the Puget Sound Halibut Fleet.

The cost of catching is but a small part of the cost of transporting, preserving, and marketing. It could increase manifold before being felt greatly. If the fish may be purchased on the docks in Seattle at 5 cents per pound, as has been done, and sold by the retailers at 25 cents, then an increase of 2½ cents, or 50 per cent of the original cost, would be but 10 per cent of the retail price. Something essentially similar to this has taken place in the fishery, the length of a voyage, and with that the expense of obtaining a cargo, having increased by about 100 per cent in the ten years between 1904 and 1914. That means that the yield per vessel has fallen to a half, yet the total catch landed

by the fleet has steadily increased in response to the demand. Such being the case, it is hardly to be expected that the reduction of the fishing-time by a sixth would have much effect even if it were capable of being accepted at its face value.

The apparent value of the close season during the winter is greatly modified by certain considerations. One of the most prominent of these is the fact that during the two months of December and January the catch is but half that prevailing during the summer months, as is shown on the foregoing chart. That is, the effectiveness of such a close season would be half that of a similar one in the summer. Furthermore, the decrease in total catch is in accordance with the diminished catch per unit of gear, and indicates with it the fact that the two proposed months are the most expensive. Providing the far greater consideration of the future of the banks were not in question, there would be no possible objection to legislating away the unprofitable part of a business year. But, aside from the fact that it is not the bona-fide object of the proposed legislation to increase the immediate prosperity

of the industry, it can be shown to have a really detrimental effect on the condition of the banks. The proposed close season would surely put vessels on a better financial basis, encouraging the building of more and rendering them capable of profitable operation on smaller summer catches than is now the case. This would mean the enlargement of the fleet and the closer fishing of the banks, including those considered the least profitable.

Fishing on these more depleted southern banks off the coast of British Columbia is prevalent mostly in summer, because the catch per unit of gear is at that time highest, and the reliance is on young fish almost entirely. It has been shown that it is these banks which need protection, and if they are to have it, it must come while fishing is being done on them. Instead of that, as has been pointed out above, a winter close season will intensify the fishery, the more so as the most depleted banks are nearer to market than the less depleted.

Cold-storage plants play an important part in intensifying this result of the closure. They not merely



Bring'ng in the Line on Halibut Vessel.

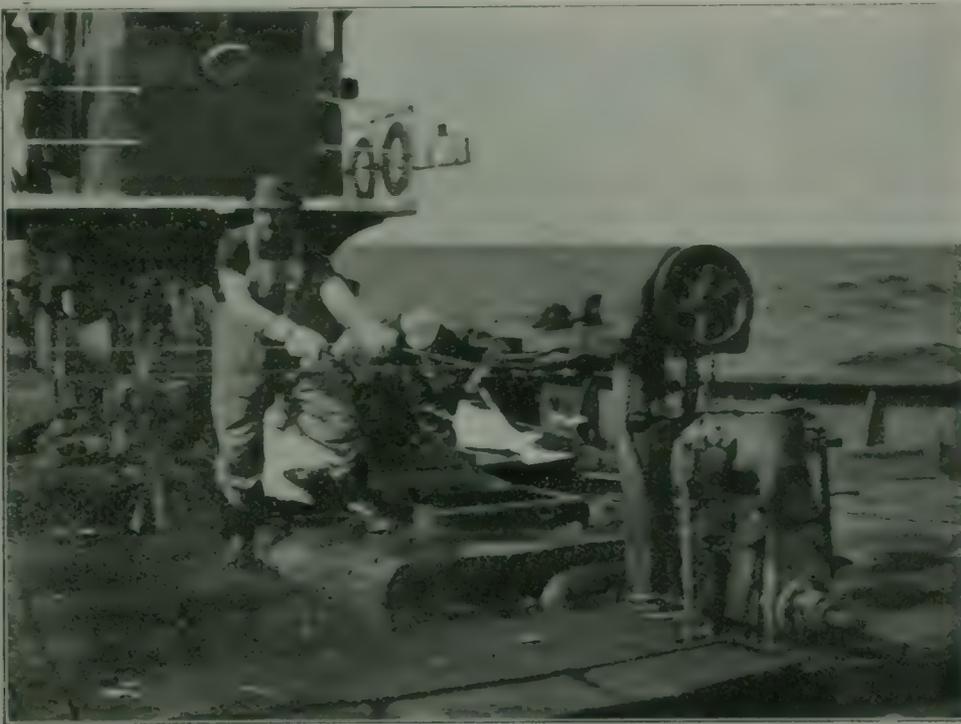
	1912.	1913.	1914.	1915.	Total.	Per Cent.
January	1,310,250	627,500	1,686,500	1,228,150	4,852,400	3.29
February	1,845,600	2,246,750	3,325,250	2,834,300	10,251,900	6.94
March	3,034,450	3,909,750	3,467,850	2,721,400	13,133,450	8.89
April	4,276,400	2,628,500	4,039,550	3,863,650	14,808,100	10.09
May	3,901,000	6,040,850	4,585,050	4,556,500	19,083,400	12.91
June	3,746,000	4,283,000	4,728,000	3,151,500	15,908,500	10.76
July	2,844,000	3,516,000	3,255,000	3,058,100	12,673,100	8.58
August	3,921,000	4,731,000	4,366,950	2,290,400	15,309,350	10.36
September	3,096,400	2,839,000	3,752,425	2,599,911	12,287,736	8.31
October	2,659,250	3,612,000	3,052,500	2,194,325	11,518,075	7.79
November	2,446,700	2,747,000	3,053,600	2,147,937	10,395,237	7.03
December	1,071,050	1,479,500	2,512,900	2,487,140	7,550,590	5.11
					147,771,838	100.06

Table and Chart Showing the Percentage of the Total Catch which is landed during the Several Months. Computed from the years 1912 to 1915, inclusive. Those parts included in the "close season" indicated by a triple line. Data taken from "Pacific Fisherman.")

maintain the demand, but tend to counteract the extensive natural increase in price in winter and the decrease during the summer. This results from the absorption of surplus fish in summer for freezing and its sale during seasons of scarcity. There is in the winter, nevertheless, a considerable catch of fresh fish with which the frozen product must compete. The elimination of this catch during several months would without the cold-storage plants apparently stop the consumption, but with them could simply force the laying by of more extensive stocks of fish frozen during the summer. It is obvious that this has a tendency to impel still better prices in summer and poorer in winter. In other words, there would ensue a more profitable summer fishery, hence a more intensive one. It should be observed in this connection that the near-by banks off the coast of British Columbia yield a medium of small-sized immature fish ("chicken halibut") very suitable for freezing. These banks are those fish-

to the effects of commercial fishing. We therefore come to the anomalous conclusion that protection is proposed for banks which show exhaustion least, as they have a more nearly adequate supply of breeding fish.

If, however, the claim had been that within the confines of each bank winter fishing was carried on in areas characterized by spawning fish, more weight might be given it. As a matter of fact, however, no proof of such congregation has been found, and observation has not yet disclosed any annual change in average size in one portion of a bank which did not take place in another. The shift in the fishing-grounds according to season, is something entirely different from this, being a removal of the fleet to other banks far distant. It is a fact worthy of every emphasis that no such extensive movement on the part of the fish is to be found, whether there is some possibility of a limited and local movement or not.



Dressing Down the Halibut.

ed most intensely in summer and need better, not poorer, protection. A certain measure of the harm might, it is evident, be averted by forbidding the sale of cold-storage halibut during the close season.

The most generally held reason for supporting a winter close season is that it is designed to protect the halibut during its spawning period. The assumption is that the fleet resorts to "spawning-grounds" in which are to be found spawning fish congregated from other localities, and that the catch consists to an unusual degree of such fish. However reasonable this may sound, it is impossible to find any basis of scientific fact behind it. On the contrary, so-called spawning-banks are those less depleted than others because less accessible, or because it pays to resort to them only during the winter seasons. It has been demonstrated that at one time the banks now characterized by small immature fish had a population of large, undoubtedly mature, fish, and that their absence is due

It would seem certain that the closure would not protect spawning fish especially, and there would be little utility in extending protection to halibut spawning and immature alike at the cost of more intensive fishing during other seasons. As has been indicated, the depleted banks are characterized by a lack of mature fish and a predominance of immature. If the latter are caught, it is a matter of indifference at which season it is done, as all succeeding spawning periods are eliminated, anyway. This is also true of the mature halibut. There is no reason why capture a week before spawning-time should be more disastrous than capture six months previously, all the remaining periods of spawning being eliminated, anyway. If the number of fish caught by the fleet remains the same, prohibition of fishing during such a season would mean naturally that of those fish usually caught during spawning the more intense fishery would cause just as many to be captured before the season as would

be caught later because of the protection. As a result the number of fish present each spawning-time would be unaltered. As a matter of fact, the areas now needing protection are those in which halibut rarely have a chance to reach maturity, and to allow them to do so the only method available is to give them a better chance of escaping capture. It is not sufficient merely to alter the time of year at which they are caught.

Among other reasons advanced is one implying that fish caught during winter are of poorer quality, with larger heads and leaner bodies, than those taken during summer. Regarding this it should suffice to state that the observed difference is due rather to the fact that in summer immature fish from banks with rapidly growing fish are utilized, while in winter mature slow-growing fish are obtained. These mature poor-quality

months, it is possible that certain modifications of it might be feasible; for instance, an extension to four months. But if not disastrous to the fishery and to the fishermen because of its length, the objection previously held that the already depleted banks would be subject to a still greater strain would apply to an even greater degree. The restraint on the fishery would be accomplished principally, perhaps, by forcing vessels and men to lose a third of their time. It is possible that some other fishery could be developed to supplement that for the halibut during that season, but at present none offers itself; and even if such were the case, the objection to the changed concentration of the fishery still remains. So it is hardly conceivable that such a measure could meet with unqualified approval.



Deck Showing Fishing Operations on a Halibut Vessel.

fish come from undepleted northern, or outside, banks naturally characterized by large-headed fish, and it is extremely improbable that they change their appearance greatly with the season. It is just as well that these fish are utilized to some extent at least. The difference between banks in so far as quality is concerned is far greater than can be assigned to seasonal differences. It is not to be denied that there is such a seasonal difference, but it cannot be assigned the importance given it. This is the more true as it has no immediate bearing on the all-important objective of preservation of the banks.

An Extension of the Close Season.

Despite the fact that there are cogent reasons against the adoption of a close season during two winter

A Summer Close Season.

A course, on the other hand, which might obviate the most dangerous features of the close season would be to place it in the summer. One summer month would be equivalent of two winter months. Such action would result in discouraging the capture of small immature fish, of which spring and summer catches mainly consist on the older banks, and would encourage winter fishing. The influence of cold-storage firms would not in such a case be adverse. But the serious question would still remain as to whether the total catch from any bank would be sufficiently decreased. If the demand overcame the handicap of an increase of the voyage length of 200 per cent within ten years, would it not overcome one of a decrease in available fishing-time of even 30 per cent? Although it is prob-

able that what the banks need is a total cessation of fishing in view of the great rate of depletion, yet such a measure as closure during summer months would be certainly effective in its nature, in contrast to the winter close season.

A Nursery.

Supplementing the proposed close season, the Bill mentioned above for the conservation of the fisheries defined a nursery of about 290 square miles to be withdrawn from use. There are very decisive reasons for regarding the measure as totally inadequate. There are no considerable migrations between banks, as has



Gaffing a Halibut as it Comes Out of the Water.

been shown, and it is not probable that any but the zones nearest to such a permanently closed region would profit by it at all. The area of the continental shelf within the 140-fathom line off the coasts of Alaska and British Columbia, between Bering Sea and the Strait of San Juan de Fuca, is certainly in excess of 80,000 square miles, of which about 1-3 of 1 per cent was to be made this nursery. The nursery itself, the region to benefit principally, would never be opened to the fishery. Behind the idea of such a nursery there is seemingly the conviction that the small fish characteristic of this region are young, but it is far more probable that they are simply a slow-growing population, from which, in addition, the larger mature fish may have been cut off. Added to this is the fact that

there is no reason to believe that the reserve in question has been bearing even its proportionate amount of fishing. So regarding this proposal it is safe to say that it would protect only the region closed. However, the idea involved in this plan, that of extending protection to an area by totally eliminating fishing on it, is a suggestive one.

Closure of Large Areas.

Before considering the last of the proposals designed to protect the banks, it would be well to observe those conditions which are not met by the others. It is obvious that the winter closed season would fail to protect the depleted banks during the proper season and appears inadequate even if changed to summer. In fact, there is doubt whether a season short enough to allow the vessels and fishermen a business in any way continuous would be adequate. The nursery, on the other hand, does not benefit an adequate area outside its own limits, and is not intended to be reopened. It is hence obvious that any measure must protect a large area for a sufficient time and during the proper season. This would be possible, considering the welfare of the fishery, only by applying it to portions of the banks alternately, making it adequate without doubt by covering all seasons of the year. We come then, logically, to a consideration of the closure of large areas for periods of years.*

There are certain general considerations which it would seem must be borne in mind in formulating such regulations. The areas must be so balanced as to add and subtract nearly identical reserves of halibut when closed or opened. Otherwise the fleet would be subjected alternately to failure of supply and abundance. This would be the more so, the larger these areas are made, and the embarrassment would reach its maximum with a division into two alternately closed or opened areas. Since the depletion of the banks is unequal, it is also obvious that fixed regulations suitable for one year might become unsuitable on the replenishment of the areas. In fact, some flexibility must be given to any regulation applied for the preservation of favourable conditions in the fleet and the trade. A prerequisite for the passage of fixed regulations which would not become dangerous would be the possession of data as to the exact location and extent of the fishery and the condition of the banks. It would seem necessary, then, to make a careful collection and survey of the logs of the fishing-vessels preceding definite regulation.

A tentative outline of legislation for the regulation of the halibut fishery may be made, taking into account the aforesaid general considerations.

I.—The banks should be divided into districts of such areas as: (1) Those off the Oregon and outer Washington coasts; (2) the coast of British Columbia; (3) between Icy Strait and Dixon's Entrance; (4) between Icy Strait and Cape Clear; (5) between Cape Clear and the entrance to Bering Sea; (6) any subsequently discovered banks not properly attached to the foregoing, including Bering Sea.

Areas 1, 5, and 6 are those least depleted; Area 2 has been shown to be badly exhausted; Areas 3 and 4 are presumably also depleted, the latter less so.

II.—Areas 2 and 3 could be alternately closed and opened, 2 closed for five years, then 3 for the next

five, an so on alternately. Areas 1, 4, 5, and 6 could be closed at the same time as either 2 or 3, their closure being subject to the discretion of conferees appointed by the two Governments; provided that, unless otherwise agreed upon by these conferees, Areas 1, 3, and 5 would be closed together, and areas 2, 4, and 6. Each area would thus be closed five out of every ten years.

This arrangement would allow sufficient latitude of time to overcome any differences in the productive power of the areas, and at the same time make the closures automatic if the times of their inauguration were not agreed upon. It would also obviate any danger of placing any particular port under a disadvantage.

III.—To cover the period of adjustment and to render protection immediately available to the most badly depleted regions, a special programme for the first ten years might be formulated. Thus Area 2 could be closed for five years, its opening to be simultaneous with the closure of Areas 4 and 3. Subsequent to the first ten years, the provisions of section II. could apply. This programme would be felt very slightly during the first five years, more in the second, and fully in the third, allowing in the meantime the exploitation of the least-depleted banks and protecting those in the worst condition. It would be advisable to close Area 2 for more than the five years during this first decade.

IV.—There should be an emergency clause enabling a further closure of any area upon mutual consent of the conferees, a closure solely in addition to the prescribed minimum.

V.—Provision could be made for the collection by each Government of data from the official log-books of the fishing-vessels, it being made compulsory for the masters of such vessels to supply in these books, over their signatures, the following information:—

(a.) Place and date of each fishing operation.

(b.) Amount of gear utilized and its nature (size of net, or space between hooks on long line).

(c.) Number and approximate dressed weight of halibut taken in each place. This should be collected by each Government and placed at the disposal of the other at the conclusion of each year, it being expressly stipulated that such data be placed in the hands of the scientific departments of both Governments, and that it be formulated by them, and in a way mutually agreed upon by the conferees. This should be the case in order that the latter could utilize the information obtained in making their decisions regarding the times of closure.

The discretionary power vested in the officers designated as conferees should lead the fishermen to furnish this information willingly, in the interests of their trade.

It appears to the writer that the principal objection which will arise will be one of inadequate amount of protection, but it is difficult to see how any other precaution than the granting of discretionary powers

to the appointed officials could be taken. The objection is one which would apply to any measure.

There may be some injury worked to vessels unable to fish outside the three-mile limit, or those with limited cruising radius. This might be greatly magnified by opponents of the measure, but does not seem important in looking over the list of vessels. It must follow on the exhaustion of the banks in any case, or on the imposition of any other regulations.

Consumers Cordage Co., Ltd., Montreal, manufacturers of "Lion Brand" cordage, has just issued a very attractive and serviceable blotter. Canadian Fisherman understands that any reader of this paper will be furnished with these blotters on request, either at the head office of Consumers Cordage Co., Ltd., at Montreal, or from their branch offices at Halifax, St. John or Toronto, or from their agents, Tees & Persse, Ltd., Winnipeg, Regina, Saskatoon, Calgary, Moors Jaw, Edmonton and Fort William; James Bisset & Co., Quebec; MacGowan & Co., Vancouver.

SARDINE FACTORY AT ST. JOHN, N.B.

J. F. Belyea Applies for Concession for New Concern.

The American sardine canneries are to be subjected to more Canadian opposition according to reports received here last week from St. John, N.B., where J. Fred Belyea, the well-known weir owner, is said to be planning the erection of a plant to be ready for opening at the beginning of the next season.

The new factory will be located in the city of St. John, at the head of No. 15 berth, on the West Side, and will cost around \$90,000 to construct. These figures indicate that it will be a fairly large plant, and also that there is considerable real money back of the project. Mr. Belyea has already applied to the City Council of St. John for tax exemption, and free water to the extent of 25,000 gallons per day, the Council reserving their decision in the matter.

The effect on canneries on this side is problematical. The tariff on sardines will prevent any competition in the American market, but it may affect the supply of fish for the Maine factories, which have of late years been securing a considerable proportion of their herring from St. John and Lepreau, in both of which locations Mr. Belyea's interests in weirs and other fishing property are extensive, and might easily determine who would get the fish in case of opposing interests.

There are already two successful sardine canneries on the Canadian side,—that at Chamcook and the Connors Bros.' plant at Black's Harbor, but there have been many failures on the part of those who have tried to build up a stable sardine business in the Dominion.—Eastport Sentinel.

* On February 26th, 1917, G. J. Desbarrats, Esq., Deputy Minister of Naval Service, Ottawa, advised the writer that, "In all the circumstances, and in the light of your reports, the most feasible course that appeals to the Department is to divide the ocean into three areas, and allow no halibut-fishing, as such, in a given area during a term of years."

Canadian Fisherman is receiving each month from Cutting & Washington, Inc., manufacturers of wireless apparatus especially suited for fishing vessels, a very attractive series of blotters. We understand this series will be mailed gratis to any readers of Canadian Fisherman who wish to apply for them to Cutting & Washington, 26 Portland Street, Cambridge, Mass.



T. W. C. BINNS
Director Canadian Fisheries Association



W. L. DOUGLAS
Director Canadian Fisheries Association



The Battle for the Fishes

How Victory Was Won

IV.

By the HON. W. E. MEEHAN,

Former Fish Commissioner of the Commonwealth of Pennsylvania—Superintendent of the Fairmount Park, Philadelphia, Public Aquarium.—Author of *Fish Culture in Ponds and Other Inland Waters*, etc.

In all important movements someone starts a slogan,—electrical and forceful,—that rallies the forces and encourages them to still greater endeavor. Fish culturists have one. It represents the potential line of work that has done more than all else towards the restoration of the fisheries. In the early days when conservationists were battling with selfish individual and corporate interests to stop the wanton slaughter of fish life and to put an end to the universal pollution of the streams, to the destruction of fish life and the peril to human health and life, and with tremendous odds against them, the war cries were along these lines. When their grand objectives were fairly realized and the work of rejuvenation was well under way a new rallying cry developed among the fish culturists.

They had mastered the problems of trout culture and brought it to something approaching mathematical exactness. Seth Green had invented a method of propagating shad. The National Government had designed jars for the incubation of eggs in vast quantities and Pennsylvania discovered a method to separate the glutinous eggs of the pike-perch so that they could be handled in the hatcheries, when the fish culturists slogan came naturally into existence. It was "Save the Waste."

The phrase was a catchy one and a literal observance of it has meant that at least seventy-five per cent. of the fish hatched in National and State hatcheries have been from eggs that would, had it not been for the intervention of the fish culturist, either have never been impregnated, or would have been mostly destroyed by spawn eating fishes. At the very lowest estimate three billions of young fish hatched under these conditions have been planted every year for almost a quarter of a century.

By the process of saving the waste, the principal fisheries of Lake Erie have been almost completely restored; the salmon fisheries of the Pacific maintained nearly to their pristine value and the fisheries of several large tidal rivers almost exterminated, have been revived to richly paying industries. As with other big things waste saving started on a small scale, on narrow

lines and without much conception of its coming importance and vastness.

From shad, white fish, lake herring, pike perch and other non nest-building fishes, the eggs of which are deposited in large numbers, it was extended to nest builders like the salmon and the fresh water basses.

Perhaps one of the greatest single accomplishment with respect to this character of work was the study of the lobster and its rescue from seriously threatened extinction. Two States, Massachusetts and Rhode Island and the National Government began an investigation of the possibilities of lobster cultivation about the same time and independently of each other. The two States solved the problem first and almost simultaneously. Since then millions of young lobsters have been saved and given a chance to grow up, that would otherwise have been totally lost, for with few exceptions the eggs were taken from females that had been caught for the market.

Lobster culture was virtually a new line in waste saving as well as a new enterprise in the work of restoring the fisheries. It is true that before investigation into lobster culture was begun, efforts had been made with some success in artificial oyster culture, but the triumph of lobster culture antedated the eminently successful waste saving methods of oyster culture as now practised.

From the very nature of the methods employed to rescue eggs and young of wild fish from destruction a name had to be found to apply to the enterprise as a whole. Field work fittingly covered it. Under the term field work may be classed all forms of fish cultural work and scientific investigation outside of the regular established offices and hatcheries. It embraced the gathering of eggs naturally deposited by wild fishes; the taking of eggs of ripe fishes caught in the nets and other devices of the market fishermen; the gathering and caring for the young naturally hatched and threatened with total destruction by the mature of their own kind and other carnivorous fishes; the gathering and transferring mature wild fish from one water

to another; the propagation of crustacea and of shell fish like oysters and fresh water mussels; the study of fishes in their natural environments and investigations made at sea with specially equipped vessels.

Some discoveries of incalculable economic value have been made by the National Government officials while investigating ocean fauna. One of the greatest was the location of an enormous bed of scallops, several hundred miles in length, extending from the neighborhood of Nova Scotia to near Cape Hatteras. In fact the find covered almost the entire area of the Banks. It is estimated that the supply is equal to the highest demand that could be made on it by the world and at the same time bring the market value down approximately to that of oysters. The find assumed a greater importance from the fact that it was the large so-called

ed later entirely unknown to science. In a short time he had boated over 5,000 pounds of them. He caught nothing else.

The new fish was unusually beautiful. Not unlike the cod in outline, its body was thickly covered with large yellow spots and the body itself had iridescent tints similar to the weak fish. On its back was a fleshy fin very like that of the salmon but located in front of instead of behind of the dorsal. On the cheeks were vari-colored tile shaped marks.

Knowing nothing of the fish, Captain Kirby threw overboard most of his catch. He regretted it however for on his return and testing the fish it was found to be of the highest food quality and a good keeper. Specimens were sent to Washington where it was found that the fish was not only a new species but of



REARING PONDS FOR YOUNG BASS.

scallop clam, three or four times the size of the usual scallop and of equal flavor. It is said however that before the discovery can be profitably utilized, some other method than the beam trawl will have to be devised to dredge the scallops.

Another interesting and valuable work of the Government sea investigation was the rediscovery of the Tile fish. This high grade fish considered by many as almost if not quite equal to the cod in flavor and average size, has a remarkable history. It rivals the most thrilling work of human fiction ever written. In human life it would be incredible.

One day in May 1879 a Captain Kirby of the schooner Hutchings out of Gloucester, Mass. was trawling for cod on the outer edge of the banks southward of Nantucket, in about 60 fathoms of water but without finding many cod. Suddenly he began hauling in large fish of a kind totally unknown to him and, as it prov-

ed later entirely unknown to science. It was given the family name of Latilidae and the generic or tribal name of Lepeltilis and the specific name of chamaeleonticeps. The popular name of tile fish was also bestowed by Washington on account of the tile-like markings on the head.

The tile fish achieved immediate popularity with the public. Huge quantities were brought into the market and promptly sold. It became one of the most important and most sought for food fish in the Boston, and New York markets. The supply continued abundant for nearly three years, then one day early in spring of 1882 the boats that went out to the fishing grounds failed to catch a single tile fish. This was the more mysterious since on the previous trip, the boats had returned heavily laden with them.

A few days later, vessels arriving at the ports of Philadelphia, New York and Boston reported passing

through miles of dead or dying tile fish. Investigation showed that the area covered by these dead fish was between 5,000 and 7,000 square miles and that the number exceeded 1,000,000,000.

From 1882 until 1915 not a trace of tile fish was found anywhere in the world although another genus of the family and a couple of species of little or no value were discovered. Scientific men became convinced that the valuable food fish had become suddenly exterminated by some sudden submarine disturbance, or by some poisonous gas or by a sudden fatal malady.

Early in the season of 1915 while the Government was engaged in marine work off Nantucket, without any warning, tile fish were caught. The location was on the old grounds in almost the same spot where Captain Kirby made his first catch in 1879. A hurried investigation showed that the fish were present in vast abundance. Later, not only were the other old grounds found to be occupied, but new ones were located along the New Jersey coast and north of Nantucket. Boats were immediately chartered and in a few weeks, the Boston, New York, Philadelphia and Baltimore markets were well supplied and since then without interruption the tile fish have been held in high popular favor. It was evident that all the tile fish had not been exterminated by the mysterious catastrophe in 1882, and that whatever the disaster was, it was of such a nature as to drive the survivors far away into much deeper water beyond the reach of the apparatus of fishermen.

The original field work in waste saving consisted chiefly in collecting eggs of shad, white fish, lake herring and pike-perch caught in the nets by commercial fishermen. Later it was extended to all the useful fresh water fishes and some sea fishes caught in the same manner. This was done by official spawntakers either accompanying the fishermen on their boats or being with the seines or other apparatus when they were operated, selecting the ripe fish and taking the eggs. Although the fishermen were being benefitted hugely by the work, and the taking of the eggs cost them nothing either in money, time or convenience, for many years both National Governments and States paid the fishermen so much a quart for the green eggs they took and fertilized. More they gave them a premium whenever they would take and fertilize the eggs themselves and deliver them to the spawn takers of the hatcheries.

It would naturally be thought that under the circumstances the fishermen would from the very beginning welcome the Government work and help the spawn takers in every possible manner. But they did not. For several years with few exceptions the fishermen were either indifferent or actually hostile. It was so pronounced that one or two of the States, Pennsylvania being one, enacted legislation declaring fish spawn to be the property of the State and compelling fishermen under penalty to receive and aid the spawn takers. It was never necessary to enforce this legislation because there came a revulsion of feeling aided largely by the element that had always given support to the fishery authorities, and nowadays both are working hand in hand.

Since the friendly feeling has been firmly established, the National Government work in white fish has been greatly enlarged by impounding green males and females until they are ripe and the eggs and milt can be taken. This is done by the co-operation of the Gov-

ernment and the fishermen. When the nets are lifted, the best females and males are selected and put in big cribs and after becoming ripe and stripped are returned to the fishermen. Any that die are paid for by the Government at the highest market price.

That phase of field work in which fish eggs naturally deposited are collected is valuable and interesting but along narrower lines than that in which eggs are taken from fish captured by commercial fishermen. In fact the eggs of only a few fishes are so collected. Yellow perch eggs are annually collected by the National Government. Pennsylvania, Iowa and one or two other States by the hundreds of millions. New York col-



CRIB FOR YOUNG BASS.

lects smelt eggs in this manner and some salmon eggs are gathered by north western coast States.

Of all collecting field work, however, the gathering of newly hatched black bass from natural waters is perhaps the most absorbing, although its results foot up only in the thousands instead of millions or hundreds of millions. First the nests of the bass must be located, and then they must be watched day by day without frightening the parent fish away until the little fish are hatched the sac absorbed and the young start to move from the bottom. Then the nest must be environed by a crib made of a skeleton frame of flat iron and surrounded by muslin or cheese cloth. The

crib is set so that none of the little fish can escape, or the enraged parent fish cannot knock it over. The little creatures are confined a few days in the crib and then removed to hatchery or field ponds containing no animal life excepting small crustaceans. They are kept there until four or five weeks old. They are then old enough to take good care of themselves and are released in waters in which it is intended for them to live.

A close study of the black bass in hatchery ponds revealed a tremendous destructiveness of the fish among themselves. Even when kept from mature fish and young of other fish the death rate is from fifty to seventy-five per cent by cannibalism in twelve months. The little fish begin devouring each other before they are two weeks old and as days go by the practice becomes more pronounced.

Many instances may be cited of the tremendous benefit fish cultural work has been in the direction of maintaining, restoring or increasing the fish in the badly depleted waters of the United States. Scarcely a year passes without something new or some additional benefit to the fish culture developing. As might be expected there are some who, in the face of overwhelming evidence doubt the value of so-called artificial



MR. MEEHAN AND HIS ASSISTANT MR. HAAS
GATHERING PERCH EGGS.

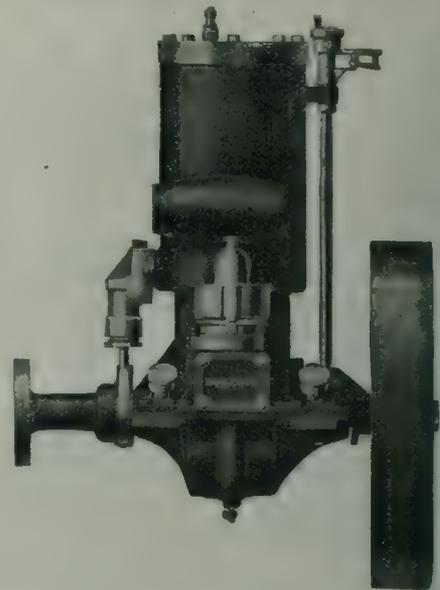
propagation, or even the gathering of spawn from the field. These hold that the same results or even greater would follow by prohibiting the catching of fish during the gravid periods. Such a close season where it can be done without interfering seriously with the catching of fish whose spawning time has not arrived or has passed is sometimes of decided benefit. But not always. There are instances where the results have been very discouraging. But it may be stated without reservation that years of practical experience has proven without the shadow of a doubt that the so-called artificial propagation of fish is several hundred fold more effective and has accomplished far greater good results than natural propagation through a closed season during the spawning period.

Probably the greatest evidence that can be produced of the efficacy of artificial hatching and planting was by the United States Government about 1874 when it transported a quantity of fry from the Atlantic to the Pacific coast. Until this planting was made there was no shad in the Pacific ocean. To-day the shad are so numerous that the annual catch supports a profitable shad canning industry and fresh shad are sent in quantity to the Atlantic sea board cities every winter.

Almost of equal evidence was the successful introduction of trout and other valuable food and game fishes in the waters of Australia.

THE FISHERMAN'S ENGINE.

One of the marine engines now on the Canadian market, which is particularly applicable to the Canadian fishermen's needs, is that known as the "Roberts Motor," manufactured by the Roberts Motor Manufacturing Company of Sandusky, Ohio. This is a two-cylinder 8-10 H.P., and can be operated on kerosene, gasoline or distillate. The engine is equipped with either make and break or jump spark ignition. One of the particular features of this engine is its great use for trawling purposes. It can be controlled so that it can be throttled down, and enables the fisher-



man to drive his boat from one and a half to two miles per hour, which is a great advantage, particularly on the majority of Canadian fishing grounds. The motor possesses the necessary strength to drive the boat up to the maximum speed, when necessary. It is not a slow-speed two-cycle motor in which the compression has been cut down and devised to run at a slow speed, but is positively guaranteed to give 8 H.P. at 300 r.p.m. and 10 H.P. at 400 r.p.m. The complete weight of this motor is 300 pounds.

The Roberts Motor Mfg. Company are builders of marine, aircraft and stationary engines, and will soon add a 4-cycle marine engine to their present 2-cycle line. The motors are marketed in Canada through all builders and responsible dealers, and in Newfoundland the Smith Co., Limited, St. Johns, hold the agency for that colony.

POINT EDWARD HATCHERY READY FOR EGGS.

Point Edward is now ready for the whitefish eggs, which will begin to arrive here from Lake Ontario points in a few weeks. About 50,000,000 whitefish eggs were hatched at this plant during the past winter and the Government men will endeavor to gather as many eggs this fall as possible. The hatchery has been overhauled and several improvements have been made by the superintendent, Adam Laschinger. The roof has been shingled during the summer, and the boilers and pumps were placed in condition. The hatch of whitefish which starts next month, will be out in April.

The Carp as a Food Fish

By J. B. FIELDING, F.Z.S.

Few of us realize the value of the European carp as a food fish, yet there are caught in Canada some 2,000,000 lbs., and in the United States 43,000,000 lbs. We are told that the consumers of this fish consist of the low class foreign element from Central Europe. Why has it not become one of the general foods of the people in this country? This is a question worthy of consideration.

In this country the carp is offered to the consumer in the worst possible way, at the worst possible age and in the worst physical condition. During the months of May and June when the large mature fish come into shallow water to deposit their ova they are netted with a sein sometimes packed and shipped, but more often impounded in muddy ponds until the price has risen to its highest point during the fall of the year. Now the condition of these fish, sold immediately after being seined, is first-class. They are mature fish of from probably 5 to 15 years old, full of ova or milt, in other words in grand condition. The flesh at such a time must of necessity be flabby and very unpalatable. Again, they are taken at a time when they are routing about in the mud under shallow water looking for food and a suitable place to spawn, from which they assimilate that well known muddy taste which is so objectionable.

Now, if these fish are impounded as is usual until the fall, what is the difference? True they may be a little less flabby, having recovered from their gravidity, but this is doubtful, since they receive little or no food, and have no access to any feeding ground. Many tons of these large fish are put into a small pond so thickly that the water is always in a roily or muddy condition. In the effort to escape they damage themselves considerably, and it is seldom a fish is seen that is not attacked with a paracitic fungoid disease known as saprolegnia feras. The mycelium of this fungus penetrates deeply into the tissues and causes great mortality, often as high as 50 per cent of the whole season's catch. Even at that, it pays the fisherman, owing to the increased price he gains by holding these fish over. Even those fish that recover and manage to live through the attack by virtue of the fact that the parasite has not attacked a vital part of the body, the tissue must of necessity be abnormal and not palatable. Further, fish impounded in these small retaining pools must of necessity assimilate a muddy taste.

Hence it will be seen that to a large extent the fisherman is to blame for the bad name the carp has obtained in this country as a table fish. In plain language, the fish now offered the consumer is of very low grade, but it is the nearest these central European settlers in this country can get to the genuine thing they got in their former home.

Before dealing with the economic question, let us look into the history of the carp, for we must remember that it is not indigenous to this continent. The date of the introduction of the carp into this continent. I believe is not known, but I am under the im-

pression it was introduced within the last 40 to 45 years.

Varieties.—There are many varieties of carp, indeed, so varied are they in Central Europe that stud books or registers are kept for them at all modern carp farms; however, the three great groups of which the many sub-varieties belong are:—

- 1.—*Cyprinus carpio communis*—the common scale carp.
- 2.—*Cyprinus carpio specularis*—the mirror carp.
- 3.—*Cyprinus carpio coriaceus*—the leather carp.

The carps used for artificial cultivation are selected from these groups for their special tendency towards, 1st, rate of growth, 2nd adaptability to climatic changes, that is between water temperatures of freezing and 100 deg. F.; 3rd, time of reaching maturity; 4th, contour of body, e.g., deep shoulder, high and broad back, etc.

Now the term carp therefore includes many types and, further, we must bear in mind that the carp will inter-breed with the so-called crucian carp—*carassius vulgaris*, a common fish in Europe of very inferior table value. Thus the fish we know in Canada is a mongrel gradually reverting to primitive type, and it has under natural conditions inter-bred, crossed and re-crossed until it has become coarse and quite unlike the brood stock that in all probability was first introduced on to this continent.

Rate of Growth.—As with all fish, the rate of growth is dependent on the mean temperature of the water and the abundance of food, but under favorable conditions a fish tender expects to put his carp on the market in its third year, weighing an average of 3 lbs., and this without intensive methods being employed.

Food of the Carp.—Carp are often accused of being vegetarians, but this is a wrong impression, for they are omnivorous and for the most part only consume vegetation incidental to seeking the microscopic life living upon it. It is true that on opening a carp the alimentary canal will be found highly charged with algae, but I think German authorities are satisfied that the carp can make very little use economically of vegetable diet alone, except in the case of microscopic vegetation. The carp's habit of rooting amongst wild rice beds and other vegetations is rather to obtain the microscopic vegetable food entomostraca larvae, and small shell-fish. It appears to have all the propensities of the hog in its power of rooting in pursuit of food. Were it a fact that carp were vegetarians in diet and that vegetation consisting mainly of algae, we could not expect to get the rapid growth we do. Such vegetation as we find in the alimentary canal of the carp is of a very low order, so far as its nutritive value is concerned, hence we must look elsewhere, and the obvious conclusion is that the rapid growth is mainly dependent on the animal food consumed.

Some fishermen when it suits their purpose tell you that carp live on the young of other fish and ova; it needs very little argument to prove that such is not the case. It is, however, possible that at times when

seeking other food a few ova may be sucked up into the mouth, but to say the carp is cannibalistic is entirely erroneous, as has been proved over and over again on carp breeding establishments.

The carp breeder aims at the artificial stimulation of all small animal aquatic life as a source of food for his stock, but without rank and vigorous vegetable life in the water he would be unable to promote the rapid development of the former.

Propagation.—The spawning period of the carp is spread over the months of May and June, but the exact date is governed by the temperature of the water in the locality. As a rule, the carp reaches maturity at three years old, but much depends on temperature and food supply. The female is very prolific, producing about 90,000 eggs for every pound of her weight.

The period of incubation of the eggs is very variable, and is governed entirely by the temperature of the water. The period varies from three to twenty days, the warmer the water the quicker the incubation.

The eggs when deposited are scattered broadcast over vegetation, and the actual process of spawning and impregnation is spread over many days. During this period the eggs, naturally unprotected as they are, become an object of food to many creations, particularly the larvae of carnivorous insects such as *Dytiscus* and dragon fly larvae. Spawning takes place in very shallow water amongst the thickest vegetation.

Under artificial conditions in Central Europe, the method of procedure is as follows:—

A pond $\frac{1}{4}$ -acre in extent is kept dry all the year except for the actual spawning time of the carp. The bottom is well cultivated and as a rule carries a heavy crop of grass usually orchard grass, *Dactyloctenium* glomerata. It is then ditched in such a way that the water when lowered leaves the grass exposed and the fish in the ditch round the margin. From this pond is a large pipe leading to a larger pond, generally about four acres in extent; this latter is called the yearling pond. Here the fish remain for a year before being pushed by intensive means. The small spawning pond is known as such and a spawning unit is introduced. This latter, as a rule, consists of two ripe females, two ripe males, and one immature male, the latter being introduced to stimulate the other or active males to properly fertilize all ova deposited. As soon as spawning is completed, the pond is lowered, and the parent fish taken out. The pond is then raised so as to have about 3 to 4 inches of water over the eggs, which are left until all are hatched out. As soon as the fry appear to be on the feed a sluice is opened and they pass into the yearling pond where food is awaiting them. Here the fry develop rapidly, and by the autumn they have acquired a length according to food supply of from 4 to 8 ins. in length, or from about $\frac{1}{4}$ lb. to $\frac{1}{2}$ lb. in weight. I need not describe the subsequent treatment which consists of intensive cultivation of the food necessary to the quick production of marketable fish weighing 3 to 6 lbs.

Food Value of Carp.—The suggestion that we should have carp often on our table in this country always meets with ridicule, mainly, I am of the opinion, because the fish offered is an old breeding fish off a mud flat. Is it surprising we should object to such food; we would not consider eating any other animal in somewhat analogous circumstances. Yet the Germans of Canada will eat this fish they say—possibly—be-

cause they cannot get the fish in its proper condition they have to take it as it is offered.

The carp breeder sees to it first that he has no spots in any of his ponds which contain mud highly impregnated with decayed vegetation, secondly he sees that his fish are put on the market at the end, not the beginning, of the feeding season; thirdly he would never think of offering a "gravid" fish. His fish would be young, firm, plump, and entirely free from any offensive smell or taste. I myself have known carp cut in fillets and put on the table only boiled in water, which have passed off as haddock, and in one instance as pickerel, and pronounced excellent. If our carp were properly handled after catching, much of the prejudice now rampant would go but they should not come on the market before the middle of September and preferably before the first frost. I know of few finer fish grown under suitable conditions and put on the market at the right time than the carp. Carp is to-day served in many eating houses in the States under other names. In 1902 some 224 men of the Northern American Fish and Game Protective Association, and representatives of the fishery departments in Canada were purposely deceived at a banquet by being fed carp for red snapper. None of these experts apparently discovered the trial of taste, which tends to prove that when properly grown and properly marketed and cooked there are few better fish to be had in inland Canada. The food value of the carp is high, in fact it contains nearly as high a percentage of protein (flesh growers) as sirloin beef.

Objections to Carp.—It has been said that the objections to carp are so many that the question even of its protection cannot be even considered. Some of the following reasons are raised:—

- 1.—By its feeding habit it stirs up so much mud that the ova of other fish are destroyed.
- 2.—That it destroys vegetation valuable to ducks.
- 3.—That it devours the spawn of fish and also the fry of other fish.
- 4.—That it is unpalatable and has no food value.
- 5.—That it is of no sporting value.

Reply to objections:—

- 1.—While it does stir up mud, the bass is about the only fish of economic value which deposits its eggs about the same time and in approximately similar conditions. The carp is a food fish, the bass a fish of lesser value as good, though valuable to the sportsman.
- 2.—The question is whether sport to the few is more valuable to the country than food for the multitude.
- 3.—This has never been proved as a habit.
- 4.—Under proper conditions this objection is unfounded.
- 5.—Quite true; the same applies to the white fish.

Advantages of Carp as a Source of Cheap Food in the Interior Provinces.

- 1.—The carp is very prolific and adaptable.
- 2.—It lives largely on foods easily stimulated and of less value to other fish.
- 3.—Its extreme hardiness during all stages of its existence.
- 4.—It will live in waters where other fish of high food value cannot be economically grown.
- 5.—It has non-cannibalistic habits of feeding—an important point.
- 6.—Rapidity of growth.

While by no means an advocate for the broadcast

planting of carp in waters now producing valuable fish, it is worthy of consideration in times of food shortage whether many of our so-called inland barren waters could not with advantage be made to produce a crop of carp. Many of these waters now do not produce the food essential to the lake trout and whitefish, and might surely be allowed to produce carp under technical supervision, so as to get the best food results. Fish is fast, under the able stimulation of the Government, becoming a common food of the people, and many fish are eaten under the title of fancy names which they would not were they given their true name.

Give any commodity a bad name, and it is difficult to place it on the market except by deceit; the same applies to all food. Again, many erroneous theories relative to the carp are current, and it is well nigh impossible to convince people of their incorrectness. Until quite recently we were told the turbot could not be sold in Canada, while in England it was being regu-

arly sold as a delicacy at 60 cents per lb. On the other hand we are told that until recently young veal was put up in cans and sold as "boneless turkey." There is more in a name than many people think. So valuable did the people of Germany think before the war the flesh of the carp, that carp farming had assumed quite a large industry while stock registers were common everywhere. I myself remember some ten years ago visiting a large penal establishment operating a 2,000 acre carp farm in northern Hanover and the superintendent telling me it was highly profitable and more than paid all expenses.

The time is fast approaching when we have to consider two great problems:—

First.—The question of obtaining the maximum of food with least expenditure of labor and capital.

Secondly.—The question of utilizing the vast lesser areas of water in inland Canada now producing nothing.

Annual Report of British Columbia Fisheries

The report of the Provincial Fisheries Department for the year 1916 was issued by the King's Printer to-day. As usual, it is a valuable publication, containing many special papers, including "The Regulation of the Pacific Halibut Fishery," the "Egg Production of the Halibut," a "Contribution to the Life History of the Pacific Herring," and "The Life of the Pacific Oyster—Cultivation," besides reports from the fishing and spawning grounds of the principal salmon streams of the Province.

The report proper deals extensively with the salmon fishery of the Fraser River District. It reviews the history of salmon fishing in that district—which includes the waters of both the Province and the State of Washington, through which the sockeye seeking the Fraser are captured—and traces the decline in the catch in the lean years and the reasons for it in such clear and forceable language as to command the attention of the authorities on both sides of the international line. It is an able presentation of the case.

The Fishery Products of the Province.

The value of the fishery products of the Province for the year ending March 31st, 1916, are shown to have totalled \$14,538,320, or 40.54 per cent of the fishery products of the Dominion, which totalled \$35,860,700. As in recent years the Province again lead the Provinces of the Dominion in the value of its fishery products. British Columbia exceeded Nova Scotia by \$5,371,469.00, and exceeded the total combined fishery products of all the other Provinces of the Dominion by \$2,482,783.00.

Notwithstanding the fact that the fisheries of the Province show an increase in value of \$3,023,234 over that of the previous year, the quantity of the leading species of fish caught was notably less. The gain in value is due to an increase in the price received for the catch.

Of the fish marketed salmon produced \$10,726,816, herring \$1,009,708, halibut \$1,972,000, cod \$300,049, and

oysters and clams \$98,130. The list of species marketed included twenty-one varieties.

The 1916 Salmon Pack.

The salmon pack for the calendar year 1916 totalled 995,065 cases, as against 1,133,381 cases in 1915. The pack of 1916 is valued at \$10,726,818, as against \$8,018,835 in 1915, a decrease of 138,316 cases and an increase in value of \$2,707,983.

The Salmon Pack of Fraser River District.

The salmon pack in the Fraser River district, which includes the catch from the waters of the Fraser River, Gulf of Georgia and Juan de Fuca Strait in the Province and the channels in the State of Washington leading to the Fraser River, in 1916, was the smallest ever recorded there, notwithstanding a notable increase in the pack of chum salmon, a species but little used in former years. The total catch of sockeye salmon in the entire district produced a pack of only 110,476 cases. Of that amount Provincial canners packed but 32,146 cases or, 30 per cent, and the canners in the State of Washington 78,478 cases, or 70 per cent.

The Pack in the District for the Past Eight Years.

The report gives a tabulation of the pack of sockeye salmon caught in the Fraser River District, in British Columbia and the State of Washington for the past eight years, which affords a comprehensive basis for an understanding of conditions in both Provincial and State waters of that district. It displays the vast difference in the catch in the big and the lean years for the entire district, as well as the great difference in the proportion of the catch in the State and Provincial waters, and also a decline in the run in the lean years. The pack for the years given includes the last two big years (1909 and 1913) and the last

six lean years (1910, 1911, 1912 and 1914, 1915 and 1916). Together they constitute the last two four-year cycles of the run to the Fraser. The grand total for the eight years is 5,775,397 cases, of which 1,939,488 cases, or 33.9 per cent were packed in the Province and 3,815,909 cases, or 66.0 per cent, in Washington. In every recent year, except that of 1915, the catch of sockeye in the State waters of the District has exceeded the catch in Provincial waters. The pack from the State waters in the two big years exceeded the pack from Provincial waters by 2,671,003 cases, or more than 100 per cent. The pack in the State in 1909 exceeded the combined pack in Provincial waters of the last two big years (1909 and 1913). The Sockeye pack in the State in the six lean years exceeded the pack in Provincial waters in those years by 1,038,745 cases, or 157 per cent. The decline in the catch in the lean years is pronounced. The catch in Provincial waters in 1916 was 91,733 cases less than that of the previous fourth year, a decline of close to three hundred per cent. The pack in the State in 1916 was 105,420 cases, or 42.4 per cent less than in the previous fourth year.

All Fraser River Sockeye.

It has been demonstrated in previous reports of the Department, and by the findings of two international commissions, that the sockeye caught in the Fraser District, are predominately four years old, were hatched in the Fraser watershed, and when taken were seeking to return to that river to spawn and die, it is, therefore manifest that the catch in both the big and lean years are the product of the same spawning beds. The catches in the big years show the maximum product of the spawning beds—the harvest that may be reaped four years after the beds have been abundantly seeded. The catches in the lean years show the minimum product of the spawning beds and are the natural result of a failure to seed these same beds abundantly.

The Result of Abundant Seeding.

If the beds were as abundantly seeded in the lean years as they are in the big years, they would produce as abundantly.

Since the beds were abundantly seeded in 1909—a big year—the catch in that year represented that proportion of the total run that was in excess of the number necessary to stock all the beds. The great catch in 1913 was the product of the abundant seeding in 1909—the natural result of that abundant seeding. Notwithstanding the fact that the catch of 1913 was very much greater than in any former year, investigation disclosed that a sufficient number of the fish escaped capture and passed above the fishing limits that year to have stocked all the beds as abundantly as in 1909.

The Capital Stock of the Run.

"The catches of 1909 and 1913, great as they were, were not made at the expense of the capital stock—of the foundation of the run. The catches made in 1909 and 1913 disclose the vast numbers that may be safely taken from every year's run when the beds are abundantly seeded. The catches in the lean year are growing less, because they are made at the expense of the fish necessary to seed the beds. They are an

overdraft on the runs of the future. The runs can neither be maintained nor built up under such conditions."

Remedial Measures.

"If, for a period of lean years all the fish which return from the sea were permitted to reach the spawning beds and there spawn, the runs in those years would eventually reach the proportions of a big year. It is simply a matter of conserving the brood stock—of seeding the spawning beds.

The salmon industry does not depend upon the monies invested in canneries, boat and gear. It depends upon the number of salmon which escape capture and successfully spawn. The fish that escape are the stock in trade. If the catch is not confined to that proportion of the total number of fish in the run, that is in excess of the numbers necessary to seed the beds, it is made at the expense of the capital stock of the industry."

For the past fourteen years the reports of the Provincial Fisheries Department have called attention to the conditions on the Fraser River spawning beds, which forecasted the depletion of the runs in the lean years. That not enough fish reached those beds to maintain subsequent runs.

The Record of the State of Washington.

The history of the fishing in the Fraser River District for the past fourteen years is a record of depletion—a record of excessive fishing in the lean years. A record of the failure on the part of the authorities of the State of Washington to realize the necessity of conserving a great fishery, notwithstanding the convincing evidence submitted to them, by agents of their own creation, that disaster was impending to one of their great industries.

The Canadian authorities, on the other hand, by their presentments and acts, evinced in unmistakable manner, their willingness to deal squarely and adequately with conditions that foretold depletion, and to join with the State of Washington or the United States Government, in legislation to prevent it.

Throughout the negotiations between the Canadian and the State of Washington authorities the former has urged the passage of restrictive measures for both Provincial and State waters. Following the investigation in 1905 of a joint commission representing the Dominion of Canada and the Governor of the State of Washington, the former approved the unanimous findings of that body and passed, as recommended, an Order-in-Council which suspended all sockeye fishing in the Canadian waters of the Fraser River District during the years 1906 and 1908, conditional upon the legislature of the State of Washington passing an Act suspending all sockeye fishing in their waters of that district in both 1906 and 1908. The legislature of the State refused passage to such an Act, whereupon the Dominion Act was recalled.

In 1908 Great Britain and the United States, "Recognizing the desirability of uniform and effective measures for the protection, preservation and propagation of food fishes in waters contiguous to the Dominion of Canada and the United States" concluded a convention for that purpose and appointed an International Commission, consisting of one person named by each Government, to investigate conditions and

prepare a system of uniform and common regulations for the protection and preservation of food fishes. That commission agreed upon a uniform system for the protection, preservation, and propagation of the salmon in the Fraser River District. The Canadian Government promptly approved of the finding and announced its willingness to adopt for her waters the regulations provided. The Senate of the United States, after years of delay, refused approval and the convention was terminated. Canada's record on this vital question is clear and unmistakable. She has been, and still is, desirous of maintaining and building up the runs of the salmon to the Fraser. The record of the State of Washington is one of inaction. Unfortunately Canada alone cannot preserve the fish. Until such time as the authorities of the State of Washington indicate by their enactments, their willingness to meet the issue there is no relief in sight and the runs in the lean years will continue to be decimated.

The failure of the State of Washington to recognize the necessity and the advantages that would follow the suspension of sockeye fishing in the lean years in her own and Provincial waters of the Fraser River District is a reflection upon her business foresight. Her interest in the catch of sockeye in each of the last three years (1905, 1909 and 1913) has averaged 1,399,808 cases per year, and having an average value of \$11,198,464. Her average in each of the last six lean years has been 182,091 cases per year, of an average value of \$1,486,726. The average value of her catch of sockeye in the big years exceeds the average value in the lean years of approximately 9,741,736 per year. As has already been submitted, the catches in both the big and the lean years are the product of the same spawning beds. These spawning beds would produce averagely as great a run in the lean years as they now produce in the big years if they were as abundantly seeded. It is simply a question of planting. The failure of the State of Washington to join with Canada in seeding those beds every year as abundantly as in the big years entailed a loss to the State of Washington alone of \$29,225,208 in the last three years. If the State of Washington would join the Dominion in the adoption of joint regulations that would insure an abundance of fish reaching the spawning beds in the lean years—years in which there can be little if any profit to those engaged in the industry—there can be no question of the result. Provided fishing in the lean years is suspended a sufficient period, the number of sockeye that reach the spawning beds would eventually approximate the number of a big year.

The ultimate return from such a measure would be so great that it is difficult to appreciate the failure of those most concerned in the industry to secure necessary legislation in the State of Washington.

The unwillingness of American authorities to take appropriate action to perpetuate the runs to the Fraser and the fact that their fishermen catch 66.3 per cent of the fish taken annually, and the further fact that under existing conditions the run of salmon to the Fraser River will eventually be exterminated, lends force to the contention that the Canadian authorities are no longer warranted in maintaining the present close seasons or in operating hatcheries in an effort to maintain the supply. Since the run will be destroyed under conditions existing in the State of Washington, why should our fishermen be prevented from taking such fish as they are able to catch during such times as they are in our waters!

The Regulation of the Halibut Fishery.

The report deals extensively with the halibut question and advances a new measure for conserving the supply. Mr. Thompson's paper on "The Regulation of the Halibut Fishery of the Pacific," is a timely and valuable contribution to the discussion of this important question, and should be read by all concerned in this industry.

Dr. Stafford's paper on the cultivation of the Pacific oyster is of practical value to our oyster folk.

The Herring Problem.

The paper dealing with the "Life History of the Pacific Herring" is of practical value to those concerned in the development of the herring fishery. The principal object of the work conducted by this Department was to afford some basis upon which the future of our herring fishery may be judged, and to ascertain whether there was evidence of depletion.

It is shown that the herring on our coast is similar to the herring of Europe and passes as the same commercially. At present there is a growing market for what is produced, though the fishery is only in its infancy. Whether it will stand the tremendous strain borne by the European herring has yet to be demonstrated. In order to determine that it is possible to exploit the fishery to such an extent it is necessary to accurately and carefully investigate the biology of the species, its normal condition, the distribution of classes and the ages of fish, and the habit of life. The possession of such means of judging the state of the herring fishery, its progress and prospects of permanency, justify any effort to fulfil these requirements. It is obvious, as the report shows, that for such work there must be a far-reaching organization. The plan for the work outlined is a broad one, and one that should command the attention of the authorities while the fishery is still in its infancy.

Report from the Spawning Beds.

The reports from the spawning grounds of the Fraser, Naas and Skeena Rivers and from Rivers and Smith's Inlets, disclose that with the exception of the Naas River watershed, there were less spawning fish to be found than in any previous year. The decrease in the watershed of the Skeena River and Rivers and Smith's Inlets is given at 75 per cent of that of former years.

The value of these reports to those engaged in the salmon fishery was clearly disclosed this year on the Fraser. The 1913 report from the spawning beds of the Fraser gave a timely warning to canners and fishermen of the great decrease in the run to that river this year.

The report, as usual, is replete with statistics and illustrations, and maintains the high standard which the reports from this Department have so long maintained.

The Lake Erie Fishermen's Association, affiliated with the C.F.A., have offered to sell fresh ciscoes and herring to the Ontario Government at a price low enough to retail to the consumer in Ontario at not over 10 cents per pound. By doing this, the fishermen are reducing their prices by two and three cents per pound less than they could sell in Buffalo,

Canada's Fisheries as a Source of Food Supply

III

The Place of the Salmon in a Classification of Fishes

J. STAFFORD, M.A., PH.D.

After the preceding (September) brief account of the structure and organization of fishes, we are in a better position to grasp the principles upon which it is possible to construct a classification of fishes, and to understand the uses of a classification.

It may be the opinion of some people that classifications are unnecessary, that they are only of interest to the specialist, that the only things worth while are the individual fishes with which we come in contact.

the characters of a mean than those of so many individuals.

As near as I can recall it has been claimed that there are at least 70 varieties of the trout. A list of 569 species of fishes has been given for British North America. A classification of considerably over 3,000 species has been made for the United States and Canada. It is completely beyond the ability of man to comprehend in detail such numbers. Besides it is



BROOK TROUT.



SOCKEYE SALMON.

Let us assume that these statements are correct, or nearly so, and proceed to put them into practice.

Suppose we are just beginning to study fishes and the first one we come in contact with is a trout. We learn what appears to be all there is to know about it. Perhaps the next fish will be a bass, then a ling, and so on, and we remember our first impressions and the facts of careful examinations. Sooner or later another trout will come to hand, but may be much larger and brighter colored than the first and, not being able to

not necessary to try to do so. The alternative is method, and the method is classification.

By grouping numbers of fishes together according to their resemblances and setting the groups apart according to their differences, we reduce the great numbers to relatively few types, and need only remember the main characters of the types. Even this is not so much a direct effort of the memory as an impression ob-



STEELHEAD TROUT.



OUANANICHE, LAND-LOCKED SALMON.

recognize it as a trout, we set it down mentally as a new kind of fish. After a while we have seen so many trouts that the difference does not seem so wide as at first. We have learned that a definite size or arrangement of spots or bands of color is not essential, and we insensibly form a mental picture intermediate between the extremes and set this up as a mean and in fact as an ideal of what the trout is. In reality we have been comparing and contrasting, i.e. classifying, whether we meant to or not, and have formed some conception of what constitutes the species 'trout'. Similarly with the other fishes. In time the mass of facts connected with the individuals becomes too great to retain. It is easier to grasp and remember

tained by frequent observation and handling of specimens.

In a similar manner by taking a broader and more general view of the types the latter may be again classified into groups of a higher order. This is one purpose of classification, viz. to reduce the whole to the compass of a mental conception. Another advantage is that a table of classes should indicate the position of each fish among all those with which it is more or less closely related. A trout is more closely related to a salmon than it is to a cod. In order to show this the classification must be constructed according to the blood-relationships or natural affinities of the fishes—what is called a natural classification.

Our method of judging blood-relationship is chiefly by comparison of organization, i.e. comparative anatomy, but to this are added facts of origin and development of individuals (embryology) and the study of fossils (palaentology). A third use of classification is as a convenience in searching out the species to which any fish belongs and in finding its proper name. For this purpose a classification does not need to be a

position to understand and follow it up. The word 'scientific' comes from the Latin 'scientia', knowledge, and 'facio' to make, i.e. mad knowledge, what we are sure of in opposition to what we are merely to suppose. Scientific knowledge does not differ from other knowledge that is correct and provable. With regard to its being too technical it may be recalled that when a seaman meets a landsman and be-



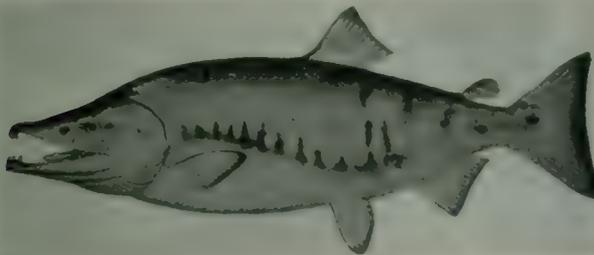
SILVER SALMON.



CHINOOK SALMON.

natural one but may be artificial or simply a key. Such a table, built upon size, measurements, shape, color, or other external features, peculiarities, habitat, and the like, using only a minimum of organization, does not require such a broad and special knowledge of anatomy and associate subjects. A perfect natural system would mean perfect knowledge, which of course is impossible, for there are from time to time new species being discovered and fresh facts about the old are

gins to discuss nautical matters he will make use of terms that, although familiar to himself, are sure to sound highly technical to his auditor. In the same way it would be rather difficult, and indeed undesirable, to speak of the classes of fishes without using some terms that may be new to the reader. But such as can be easily avoided should be, and those that are likely to be new should be defined. It is not proposed to go into details or to treat of subjects that are too technical or too special. The whole subject is too large



CHUM SALMON.



HUMPBACK SALMON.

continually coming to light. The best that can be done at any time is to approach the perfect as nearly as attainable, and to seek to improve the system by correcting and adding to what is already known.

Before going farther it may be well to correct any impressions that the method of classifying is too difficult, too scientific, too technical for fishermen and most other people to bother with. It may be true that it is outside of their habitual line, but that is not a

to admit of being discussed in a brief article, so that all that can be done is to select such parts as will serve to illustrate the method and at the same time perhaps put those who desire in the way of obtaining further information.

What most people would call a 'kind' of fish is what is more accurately speaking a 'species'. There may be one to many species included in a more comprehensive group called a 'genus', one to many genera in



RAINBOW TROUT.



CUT-THROAT TROUT.

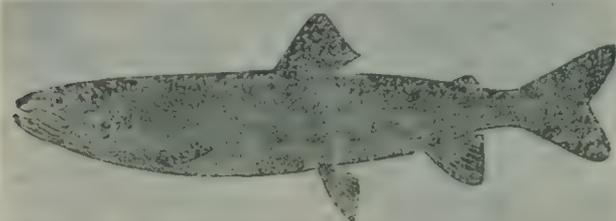
sufficient reason why they should not desire to learn something about the subject. Up to a limit there is nothing difficult. Since, as we have seen, classifying depends upon the likenesses and differences between fishes, the fishermen and fishhandlers are in the best

a 'family', and so on up through 'order', 'class', and 'subkingdom' of animals rising from individual to class, from special to general, from concrete to abstract. Or, reversing the order, we may start with the higher, more general, and more comprehensive

groupings and work downwards to the species and their numerous individuals thus:

- Kingdom,
- Sub-kingdom (Branch, Phylum),
- Class,
- Order,
- Family,
- Genus,
- Species.

In cases where the members of a group are very numerous and variable in structure, it may be necessary to further subdivide them into 'sub-class', 'sub-order' etc., and sometimes into 'super-order', etc. Sup-



LAKE TROUT.

posing we have in mind the Atlantic salmon, the arrangement will be something like this:

- Kingdom Animalia.
- Sub-kingdom Vertebrata.
- Class Pisces (Fishes).
- Sub-class Teleostomi.
- Series Physostomi.
- Super-Order Teleostei.
- Order Malacopteri.
- Sub-Order Salmonoidea
- Family Salmonidae.
- Genus Salmo.
- Species salar.

We can recognize at once that the salmon belongs to the kingdom **Animalia** or animal kingdom in contradistinction to the plant and mineral kingdoms. In this way we exclude great groups of other natural objects about us from the comparison and narrow our subject down to fewer things to be further studied.



ATLANTIC SALMON.

It must be mentioned at the outset that we are often met by old and often false ideas that have been handed down from early and less scientific times, when the minds of men were already striving to grasp the meanings of things but often seized on some unimportant associated phenomenon rather than the essential part. Man's first knowledge, we may be sure, did not refer to foreign objects but to himself and his associates. One of his early impressions was that when people cease to live they cease to breathe, so he concluded that breath was the essence of life, and consequently the living things with which he was acquainted were

called 'animals' (from 'anima', air, breath, spirit, soul). Posterity has retained the term but it has undergone some change in meaning. The salmon is an animal although it does not breathe air as man does and is not generally thought to possess a spirit or soul. Science is sometimes hampered by the old meanings that are read into certain words. Familiar words are used where they can be, but it is often necessary to construct new terms that have no traditional significance and can consequently be given whatever meaning the inventor chooses to give them.

That the salmon belongs to the sub-kingdom **Vertebrata** may be judged by feeling for the spiral column, or, if that is not satisfactory, a slit may be made through the skin and muscles of the dorsal region, exposing the vertebrae (so named from the Latin 'verto' to turn, because the jointed bones can turn on one another and permit bending of the body of the animal). All other sub-kingdoms of animals, such as Arthropoda and Molluska, have no vertebrae, in fact have no bones.

As to the salmon's belonging to the class **Pisces** (Latin for fishes) there will be no question—although it must be acknowledged there are fishes not so readily judged. The vertebrate classes are: fishes, amphibians, reptiles, birds, and mammals. For our present purposes a fish may be regarded as a vertebrate animal that in the adult state moves by means of fins



SEBAGO TROUT.

and breathes by means of gills. It may not at first be apparent why it is necessary to restrict the group in this way, but upon further thought it will be remembered that tadpoles swim by a caudal fin and breathe by gills, but they are the young (larvae) of frogs and toads, not adults and not fishes. There are related animals, such as the mud-puppy, which retain their caudal fins and gills throughout life, but they develop legs also which the fish never does. There is one little animal that is very fish-like in a number of features, that does not occur on the coast of Canada but comes as far north as Chesapeake Bay, that possesses unpaired fins and gills but no vertebrae, although it has an unsegmented supporting rod in the place of a vertebral column. This is the lancelet (*Amphioxus lanceolatus*) and is interesting as showing a connection between the vertebrate and the invertebrate animals, as the tailed amphibians (mud-puppy) and tadpoles do between the fishes and the higher classes of vertebrates.

The class **Pisces** is divided into the three sub-classes: **Cyclostomi** (cyclos, circle; stoma, mouth); **Plagiostomi** (plagios, oblique; stoma, mouth); **Teleostomi** (teleos, perfect; stoma, mouth). The first sub-class is represented by the lamprey

(*Petromyzon marinus*), which has a circular, sucking mouth, by means of which it clings to large fishes such as the sturgeon. The second sub-class includes the **dogfish** (*Squalus acanthias*) and **skate** (*Raja ocellata*), in which the mouth is transverse on the under side of the head. The third sub-class comprises the great masses of fishes (the true fishes—with perfect mouth, opening anteriorly at the end of the snout).

I have chosen these names because they make use of the same character, viz. the mouth. The gills have also been employed for the same subdivision, and then the Cyclostomi are called Marsipobranchii (marsipion, pouch; branchia, gill), and the Plagiostomi are named Elasmobranchii elamos, plait). In a similar manner the jaws, the fins, and the scales have been made the foundation for classifying, with the result that we have a multiplicity of terms, and it often happens that those terms which have come into most use are drawn from different systems. Thus the terms mostly employed for the three sub-classes are Cyclostomata, Elasmobranchii and Teleostomi—referring to two different organs instead of one.

The Teleostomes are sometimes separated into two series according to whether there is or is not an open duct (pneumatic duct) connecting the oesophagus with the air-bladder. It is a sort of fore-runner of the trachea or wind-pipe of air-breathing vertebrates, and in one group of foreign fishes the air-bladder really acts as lungs). This character has been specialized and leads over to the condition in the Amphibia (amphi, both; bios, life), our lowest class of air-breathing vertebrates that can live in the water or in the air. In the fishes the first of the two series, **Physostomi** (physos, bladder; stoma, mouth), has the duct retained and functional, not exactly as a breathing organ but as an hydrostatic organ for changing the specific gravity of the fish, so that it can rest in higher or lower depths of water. In the second series, Physoclystic (physos, bladder; clystos, closed), the duct is reduced to an un-perforated fibre, that has lost all function and has nearly disappeared. It is a point of great interest but no essential to the classification. The salmon belongs to the first or more primitive series.

There are two supra-orders of Teleostomes:

Proostei (pro, before; osteon, bone) with cartilaginous skeletons or primitive bones, and

Teleostei (teleos, perfect), with perfect bony skeletons—the true bony fishes.

The Proostei are interesting and instructive, including what were formerly called Ganoids (ganos, splendor; oid, like) from their conspicuous enamelled scales. In this country there are two orders:

Chondrostei (chondra, cartilage; osteon, bone) to which belongs the **sturgeon** (*Acipenser sturio*) with its cartilaginous skeleton, five rows of large ganoid plates, plagiostomous mouth, hetero-cercal tail and other primitive characters.

Holostei (holos, whole; osteon, bone), including the **gar-pike** (*Lepidosteus osseus*) with its bony skeleton and characteristic ganoid plates, and the **bowfin** or fresh-water dogfish (*Amia calva*) with its smaller scales and forming a transition to the true bony fishes.

The Teleostei comprehend the masses of fishes, of which those useful for food are included in the following seven orders:

Malacopteri (malacos, soft; pteron, fin) or **Malacopterygii** (pterygos, fin) with soft-rayed fins, to which

the **herring** (*Clupea harengus*), **whitefish** (*Coregonus clupeiformis*), **salmon** (*Salmo salar*), and **smelt** (*Osmorhiza mordax*) belong.

Ostariophysi (ostarion, a little bone; physos, bladder) so named on account of the connection between the air bladder and the ear by means of the small Weberian bones. **Catfish** (*Ameiurus, nebulosus*), **channel cat**, **sucker** (*Catostomus catostomus*), **carp** (*Cyprinus carpio*).

Apodes (a, without; podes, feet), having no pelvic fins. **Eel** (*Anguilla chrysoptera*), conger eel.

Haplomi (haplos, simple; omos, shoulder), because of the absence of a mesocoracoid bone in the shoulder (pectoral) girdle. **Pike** (*Lucius lucius*), mascellonge.

The following three orders belong to the Physoclysti.

—**Anacanthini** (an, without; acanthos, spine) with no hard spines in the fins. **Cod** (*Gadus calarias*), **haddock** (*Melanogrammus aeglefinus*), **burbot** or **ling** (*Lota maculosa*).

Platysomi (platy, flat; soma, body), flat fishes. **Hallibut** (*Hippoglossus hippoglossus*), **flounder** (*Pseudopleuronectes americanus*).

Acanthopteri (*Acanthopterygii*) (acanthos, spine; pteron, pterygos, fin) having hard bony spines in the fins. These are the most highly specialized fishes of the present day.

The salmon, as we have seen, belongs to the first order of the Teleostei, viz. the Malacopteri, which falls naturally into two main sub-orders:

Clupeoidea (clupea, herring; oid, like) and

Salmonoidea (salmo, oid).

The Salmonoids contain several families:

Salmonidae, salmons,

Thymallidae, graylings,

Argentinidae, smelt,

Microstomidae, deep-sea smelt.

The family Salmonidae possesses the genera:

Coregonus, white fishes.

Argyrosomus, cisco, tullibee,

Oneorhynchus, Pacific salmons,

Salmo, Atlantic salmon,

Cristivomer, lake trout,

Salvelinus, brook trout.

The genus *Salmo* has the species:

Salmo salar, Atlantic salmon.

Salmo clarkii, cutthroat trout.

Salmo rivularis, steelhead trout.

Salma irideus, rainbow trout.

NOTES

On the results of sea fishing operation in Canada for the six months period, April-September, and for the month of October, 1917.

A comparison of the totals for the six months, April-September, this year with the corresponding six months last year, shows that the landings of the two great staple kinds, cod and haddock, on the Atlantic coast during that period were over half a million cwts. greater this year than last. A greater proportion of these were used fresh or frozen and in a green salted state and less, relatively, salted and dried than in the preceding year.

The herring catch for the six months this year amounted to 645,844 cwts. against 946,487 cwts. for the same period last year. The shortage was caused by a smaller spring catch in the Gulf or St. Lawrence owing to ice remaining late on the coast, and to a

great scarcity throughout the past summer in the waters of Charlotte county, N. B.

The quantity of salmon taken on the Atlantic coast during the season of 1917 was 1,578 cwts. short of the previous season's catch.

The salmon catch on the British Columbia coast for the six months period was greater than that for the same time last year by 317,274 cwts.

But as the current year is the "big run" year on the Fraser River a very much greater increase was looked for.

Compared with the six months period in the previous "big run" year, which happened to be 1913, this year's total results are 152,129 cwts. less.

Taking the province as a whole, the difference in the result of the two "big run" years does not seem great. But when the results in the various sections of the coast are considered, the catch of 1913 in the southern or Fraser river section is found to be 140% greater than that of 1917—the falling off in 1917 being mainly in the class designated 'Sockeye'.

In the northern section which is not affected like the southern section by quadrennial "big runs" the catch for the six months period of 1917 is 77% greater than that for a similar period in 1913.

It is noteworthy that the quantity of 'black cod' brought to land in British Columbia from April to September 1917 was 56,211 cwts. as against 30,544 cwts. during that period last year.

The total value of the various kinds of sea fish at the point of landing on both coasts for the six months period in 1917 was \$19,325,547 against \$12,493,143 for the same period in the preceding year.

It may be noted that notwithstanding an extra month's fishing for lobsters along the southern part of the Gulf of St. Lawrence, from Antigonish to Gaspe, including Prince Edward Island, this season's pack is short of last season's.

Since the opening of the season on the 15th of November 1916 until the end, on the 10th September of the present year, there were packed 181,227 cases, while 70,321 cwts. were used fresh or shipped in shell.

In the preceding year, from the opening of the season, until the end, on August 11th, there were 188,545 cases packed and 94,409 cwts. used fresh or shipped in shell.

During the month of October rough and unfavourable weather greatly interrupted fishing operations on the Atlantic coast. Two fishermen were lost at sea from a Lunenburg vessel, while fishing gear along the whole coast was considerably damaged. A particularly heavy gale at the end of the month wrecked many of the fishing weirs in the Bay of Fundy.

The total landings of the chief kinds of fish for the month were therefore much below that for October last year. For example, in the whole of the Atlantic provinces there were 153,640 cwts. of cod, haddock, hake and pollock landed during October this year, against 242,580 cwts. for the preceding October. In Nova Scotia and New Brunswick there were 20,006 cwts. of herring landed against 73,563 cwts. last year. This diminished herring catch was caused not so much by the rough weather as by a continued scarcity of these fish in the Bay of Fundy.

The total value of fish landed in eastern Canada during October was \$736,567 against \$886,095 for October last year.

In the southern part of British Columbia the weather was generally fair during October, and fishing resulted in a great measure of success. The run of fall salmon in the Fraser river district was satisfactory; the catch amounted to 66,693 cwts. against 38,769 for October last year. In the Vancouver Island district the catch of salmon amounted to 116,588 cwts. mostly chums, against 156,600 cwts. for the previous October.

The salmon catch in the north for the month was 10,428 cwts. which falls short of the catch for the same month last year by 28,873 cwts.

The quantities of the chief kinds landed in the whole province for the month were as follows,—207,186 cwts. of salmon against 234,670 cwts. for October last year; 5,361 cwts. of black cod against 6,503 cwts.; 18,902 cwts. herring against 5,730 cwts.; and 14,587 cwts. halibut against 23,249 cwts.

The total value of sea fish landed in British Columbia in October was \$1,794,568 against \$1,116,546 last year, and for the whole of Canada \$2,531,135 against \$2,002,641.

THE FISH TRADE OF GREAT BRITAIN

(By our Special Correspondent.)

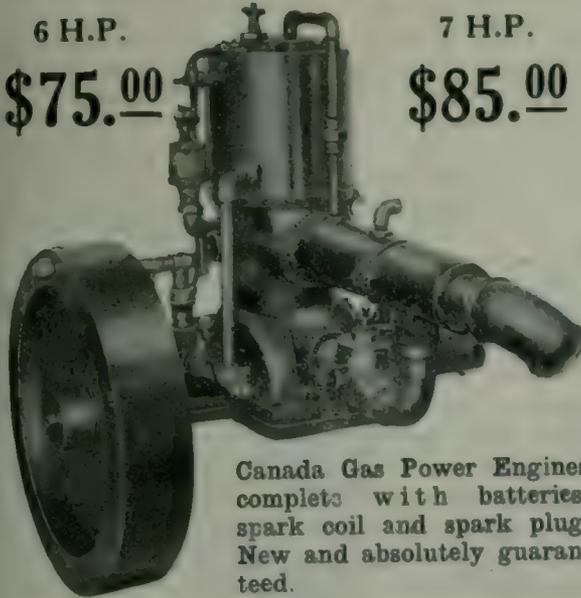
In view of the increasing importance of the fish export trade with the Old Country, the CANADIAN FISHERMAN has made arrangements for a special weekly report from London on the conditions prospects and prices prevailing in the principal fishing ports and consuming centres of Great Britain.

In considering the fish trade in Great Britain, the effect which the cataclysm which overtook Europe in August 1914 has had on this section of commerce must not be overlooked. From about 1910 onwards the Admiralty equipped several modern trawlers for Naval work and sent them on a cruise round the principal fishing ports of England and Scotland with a view to forming a Trawler Reserve for service in the event of the outbreak of hostilities. For various reasons this departure was not so successful as had been hoped; still a fair nucleus of a serviceable adjunct to the Navy was formed, and immediately the horizon darkened these vessels and their crews were mobilized for War service. This, of course, naturally weakened the catching power of the fishing fleets and as the Admiralty has since 1914 commandeered large numbers of both steam trawlers and steam drifters for national requirements, the vessels still available for commercial fishing bears little comparison with the numbers of pre-war days. Added to this, many vessels have been lost from mines or sunk by submarines, thus further reducing the catching power. Nor is this all; large areas of the waters around our coasts are "prohibited areas" by order of the Naval Authorities, so far as deep sea fishing is concerned. In considering the quantities of fish now landed at the British fishing ports as compared with normal times, all these factors must be borne in mind. The inevitable result of these attenuated landings has been that prices for all kinds of trawl and drift fish have risen steadily until now most kinds readily command rates that a few years ago would have been considered impossible.

The fisheries of Great Britain divide themselves into two main branches, i.e., trawling and drifting. Other

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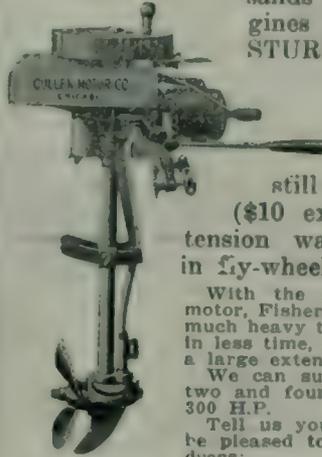
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Front Cover.

methods are employed, such as seining, longlining, etc., but these do not play an important part in the total landings. The chief kinds caught by drifters are herrings, mackerel and sprats, while trawled fish comprise all kinds of white-fish, known respectively as prime fish, flat fish, round fish, and long fish. Of recent years increased quantities of herrings and mackerel have been taken by trawlers, but drifting still remains the principal method of capture of pelagic fishes.

At the present time, the landings of fish in Great Britain are insufficient for requirements, and keen competition to secure a share has resulted in prices, as mentioned above, rising to an extremely high figure. Under these circumstances, there should be a ready sale for frozen fish for which Canada must be looked to as the main source of supplies. It must be admitted that up to the present the people of Great Britain have not shown that readiness to purchase frozen fish that its quality and condition merit. This is largely explainable by the fact that all parts of this country are comparatively easy of access to the sea, and in ordinary times can thus rely on receiving regular supplies of fresh — i.e., unfrozen — fish. Secondly, it must be admitted that largely owing to a lack of know-

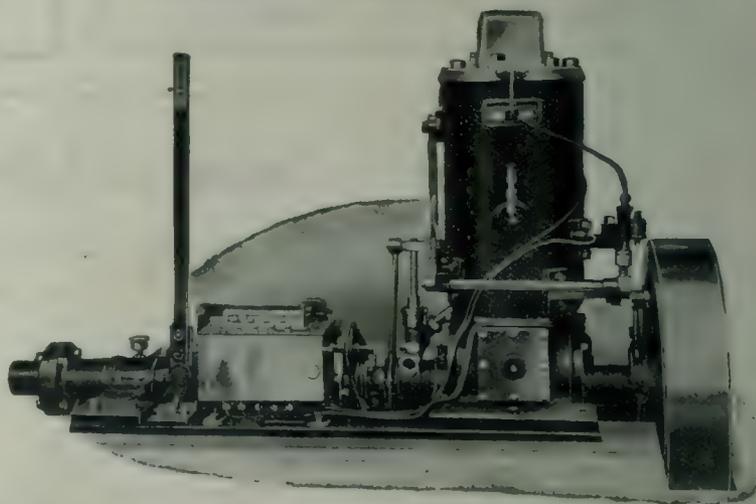
ledge, there is an inherent conservatism among Britishers to anything frozen, although this country relies on refrigeration for so much of its food, — meat, rabbits, butter, cheese, fruit, to mention only a few. Then again it cannot be denied that in many instances fishmongers, as the retailers of fish are known in this country, have not sold frozen fish for what it actually is; Canadian fish is always disposed of by importers and on the wholesale markets, as frozen fish, but frozen fish is scarcely ever seen advertized by the fishmonger. No doubt, some of them thaw the fish out and sell it as home caught, thus making a bigger profit. The same thing happened with New Zealand meat some years ago until the Dominion Government taught a salutary lesson by prosecuting the offenders. However, many of the leading retailers, including some of the high-class West End dealers now regularly offer frozen salmon. No doubt, a little judicious publicity on behalf of both the Home and Canadian Governments should do much to popularize frozen fish in the Old Country, to the benefit of all concerned. There is little question that with the coming world shortage of meat we shall be more and more dependent of the "harvest of the sea."

The "Jacobson" Semi-Diesel Oil Engine

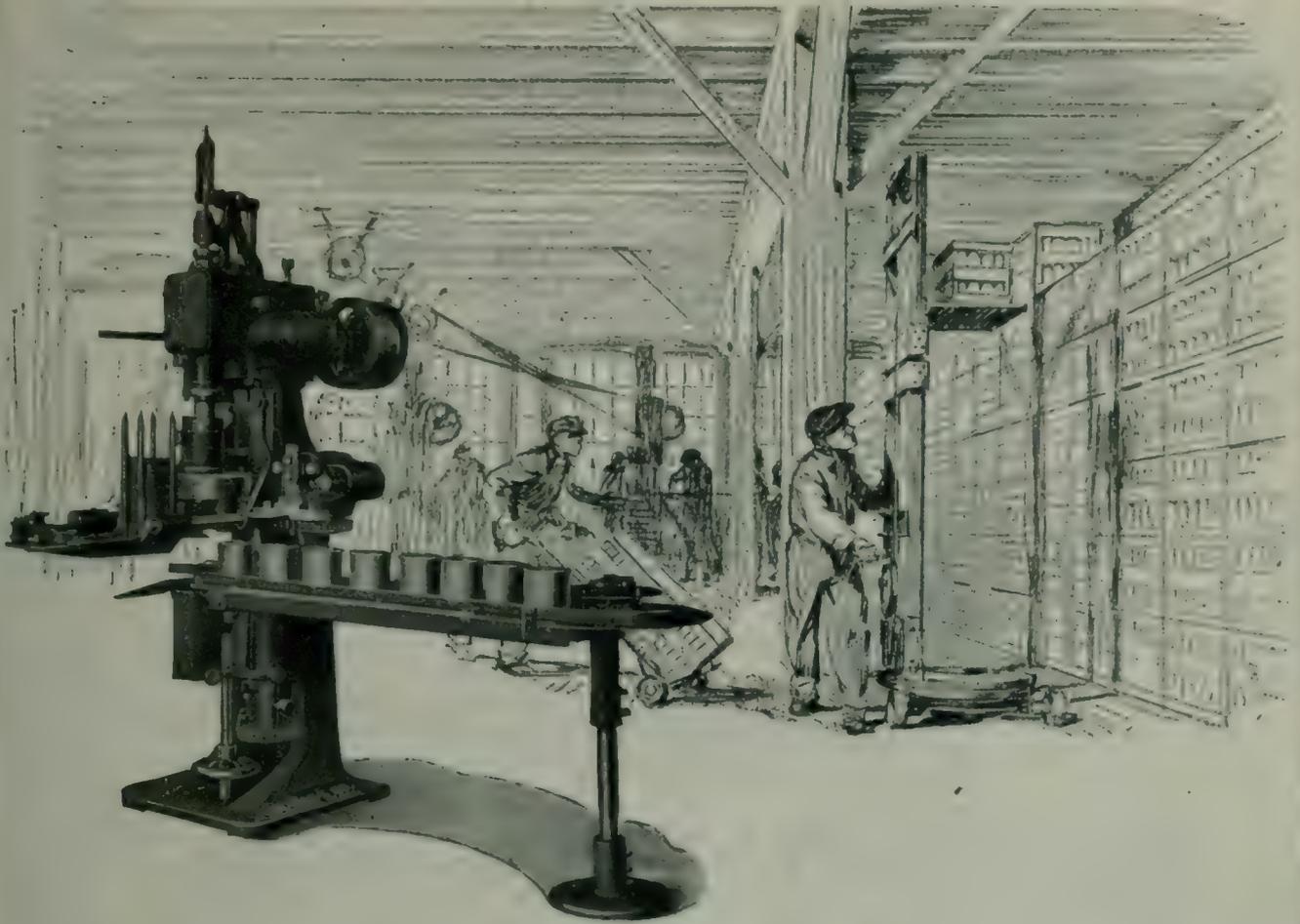
Most fishermen realize the importance of crude or fuel oil engines that work successfully on practically any oil that flows. The manufacturers claim these engines to be giving every satisfaction and draw special attention to the fact that these engines have no carburetors and no electric ignition systems.

An interesting installation is in a combination trolling and halibut boat owned by Mr. A. Strubstad of Tacoma, which it is said is the first of the kind on Puget Sound. The engine is of the Jacobson Semi-Diesel type being a single cylinder two-cycle $7 \times 7\frac{1}{2}$, developing 10 H.P. at 425 r.p.m. The engine is of the surface ignition type and it is possible to start with hot torch and kerosene within three minutes. The oil injection is controlled by a governor built into the flywheel and in operation it is stated that the engine will govern as low as 75 r.p.m. Air compression is said to be about 170 lbs. with fuel injection at about 200 lbs.

The Jacobson Gas Engine Company, Saratoga Springs, New York, are now making a specialty of engines of heavy design slow speed, from 5 to 200 H.P. in from 1 to 6 cylinders. These engines are said to be exceptionally well suited for fishing vessels. They also build a specially designed engine in from 1 to 6 cylinders, starting with 35 h.p. up to 600 h.p. for auxiliary power on larger vessels and in such works as require an unusually heavy design, and at the same time at exceptionally low speed.



The cut represents single cylinder marine engine, manufactured on single and multiple cylinder, and in many sizes. Mr. Charles A. Jacobson, President of the Jacobson Gas Engine Company when asked to give us some information regarding their engine, sent us the following:—"In the Jacobson Semi-Diesel Oil Engine we have embodied experience and experiments of over 25 years of practical designing, perfecting from actual service experience, the details and best suitable materials for producing a high standard of oil engines. We have not patched up an old design gasoline engine and called it an oil engine, but have designed a medium compression engine and a more perfect burning of the oil, hereby obtaining a remarkably low fuel consumption."



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The can supply and the operations of packing must flow smoothly and without interruption abreast of each other until the last case has been added to the pack.

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far parts of the earth where repairs or replacements would be difficult if not impossible to obtain—and has made good.

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1917

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A. R. Whittall Can Company Makes Steady Progress

Probably not in the history of mankind has there been such an insistent demand for canned goods of all kinds throughout the world, as at the present time, due to a great extent to the conditions arising out of the world war. As a result the tin can industry has received a tremendous impetus in Canada, as elsewhere, and in this connection the achievements of the A. R. Whittall Can Company have placed that concern in the front rank of Canada's successful industrial companies.

The business was started in a modest way in 1885 by A. R. Whittall, and through careful management it showed a steady development until 1916, when it became an incorporated company. The company has the unique distinction of being the first plant in Canada to start work on a war order, the latter being received on August 4, 1914. No time was lost in handling the first instalment of a business that was to show such enormous development during the next few years. Extra labour was engaged, plant extensions made, and new machinery installed, and for a considerable time work was carried on day and night in order to fulfill these orders. At the present time the company is constructing an additional building at the plant, corner of Charlevoix and Mullins street, in Montreal. In addition the company has recently purchased five acres of land on the canal bank at St. Henri on which it is the intention to erect a large manufacturing plant, plans for which have already been made, and work will be carried on with the least possible delay.

The big factory of the Whittall Company is well laid out; there is a place for everything, and everything is in its place. On the ground floor there is stored tin-plate, which should be more properly called tinned-plate. This tin-plate is composed of thin sheet steel, of the very finest and strongest quality to stand bending and stamping of a very strenuous and violent nature. The principal part of the material is steel; the tin is only a fine, pure metal coating over the steel, but the containers produced from these sheets are "tin" cans all the same. Like in all other cases of manufacturing increased costs enter very largely into the question of production. Tin-plate is costly. Before the war it was purchased at about \$3.00 or so "base". To-day for the same quantity the cost price is \$10.00, with the possibility of even a higher figure and greater scarcity.

From the basement the tin-plate is taken up in a box, and in a shining pile the plates come to the first machine, called a "slitter". The work of this machine is to take each plate and slit it to the exact size required for the body of whatever kind of tin is required.

After the cutting the plates are piled in an automatic hopper from which they are fed at a great speed into the second machine called the "locker." This machine in one swift process curves the metal plate into the body of the can, a simple cylinder of tin plate, and solders the side seam. The soldering is done as the metal cylinder passes swiftly along through a gas heated section of the machine after the bending has been done. In the meantime two other important but independent machines called power presses have been stamping from smaller sheets of tin-plate the tops and

bottoms, accurate as to size, are fed at a furious speed into the next machine called the "Header", which comes into play the instant the can body leaves the locker, and fits on the tops and bottoms a million times faster rate than any consumer can ever get them off again. The next swift stage is from the header to the crimper, the latter making sure the firmness of the tops and bottoms of the cans, which have still to be soldered, the 'floater' looking after the latter work. The floater is fitted with a solder bath and dips the advancing cans rapidly into the solder, first one end and then the other, so that the tops and bottoms are firmly fixed and rendered air tight. It, of course, will be recalled that the top of most modern cans has an aperture left through which the eatables are to be inserted in completed can, the final closing and sealing up being left to the packer. While passing through the process of the floater the cans are wiped free of any superfluous solder, and are cooled on the belt conveyor as they are carried to the testing machine.

Of all the machines the "tester" is the most picturesque; and the most impressive in all the factory. It consists of a huge wheel inclined at an easy angle, and revolving so that its great spokes or radial arms pass a given point at a rate of 9,000 an hour. On each spoke or arm, at the end nearest the circumference of the big wheel, there is a completed can just as it has left the cooling conveyor from the floater. As soon as the cans reach this great wheel they are caught and firmly clutched, while into each can is forced air at a pressure of seventeen pounds per square inch. As the wheel turns it plunges each wheel under water at a given point, in the steady progress of its revolutions. Directly above this point is applied the indispensable human factor in the making of tin cans. The testing of the finished tin is done by the human eye. A man sits like a kingfisher above the pool of water. During a ten-hour day he eyes these passing cans as they dip into the water still holding within them that pressure of air. If there is ever so small a leak, or ever so slight a defect in the manufacture, air bubbles will betray it. It is for these air bubbles that the steadily trained eyes of the testing operator watch—when they appear he has but to touch a lever when the faulty can will be tossed aside to be fully examined later on, and if possible repaired so as to stand all tests. Nine thousand cans an hour revolve under his eyes. The cans that show they are in every way perfect whirl around their giddy course, and drop off into a conveyor, which takes them dripping from the water plunge away to the drier, where they remain just long enough to get nicely dried, whence finally completed, they are sent to the packing room in the basement and from that point sent to the railroad car awaiting them at the siding.

Mr. A. R. Whittall, the president of the company, is ably assisted by his two sons, D. S. Whittall, the vice-president, and Fred. R. Whittall, the managing director. Both young men have a thorough knowledge of the business with which they are associated, and their ability together with the keen interest displayed by them in the development and success of the business, cannot but result in the pronounced expansion of the company.

Another son, Lieut. F. A. Whittall, is serving His King and Country on the battlefields of France, where he belongs to the Royal Flying Corps.

W. R. SPOONER

Wholesale and Commission Dealer

Fish of all Kinds

119 Youville Square,

-

MONTREAL

I am in the market at all times to Buy or Sell on Commission,
Fresh, Frozen, Smoked and Salt Sea and Lake Fish, in Carload
Lots or Less.

Correspondence Solicited

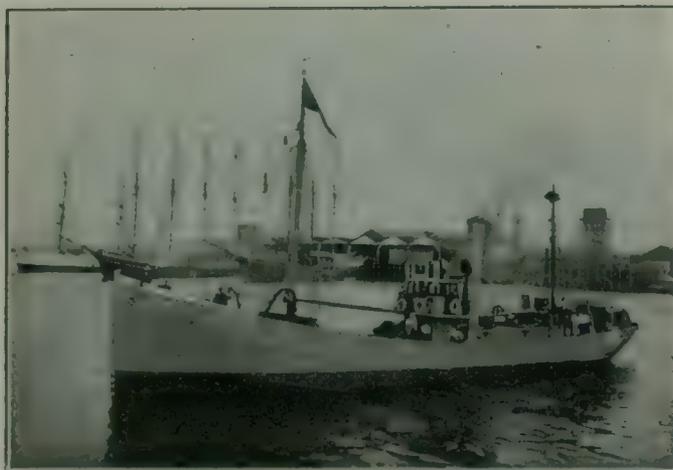
Representing

National Fish Company, Limited

Halifax and Port Hawkesbury - N. S.

“National Brand”

*Haddies,
Fillets,
Kippers,
Bloaters,
Scotch Cured
herring.*



Producers

*Fresh,
Frozen
and Salt
Sea Fish*

STEAM TRAWLER TRIUMPH.

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J. Bowman & Co., Port Arthur, Ont.
Wabakin Fish Co., Montreal, Que.

BONELESS COD FISH

R. E. Jamieson, Rustico, P.E.I.

SEA FISH

A. W. Fader, Canso, N.S.

National Fish Co., Ltd., Halifax and Port
Hawkesbury, N.S.

THE ATLANTIC SALT FISH SEASON.

Both Newfoundland and Nova Scotia report a great harvest of fish and a record cure, while prices have remained at top-notch figures. Newfoundland, for a time, was up against a serious difficulty in shipping her fish owing to lack of tonnage, but it is reported that some 20 schooners were purchased from Canada to move the catch, and that the situation is now cleared up. It is estimated that the Newfoundland catch amounts to two million quintals and the price stands at \$8.50 per quintal.

The heavy Cape Breton stock dried salt fish has been snapped up by Gloucester buyers, but Lunenburg, fishing the smallest fleet in years, has rung the bell with a record fishing season of 256,215 quintals landed by 95 vessels. Fishing was exceptionally good throughout the summer and all the vessels did well.

The schooner "Lucille Colp", Capt. Maynard Colp, was high line with 4,700 quintals. The "Colp" was hand-lining and has made a record for the county.

The Lunenburg catch at \$10 per quintal amounted to \$2,562,150 — an increase of almost a million dollars over the previous year. The stocks are as follows:—

	Quintals.
Arcola, Knickle	2700
Arcania, Hebb	2400
Araminta, Creaser	2850
Annie L. Spindler, Ritcey	2525
Aranoa, Sarty	1450
Ada M. Westhaver, Westhaver	2350
Alfarata, Wambach	3050
Allison H. Maxner, Maxner	1800
Alicante, Cook	2950
Atacama, Wentzel	1600
Annie E. Conrad, Conrad	3500
Benjamin C. Smith, Corkum	3500
Clintonia, Cook	3700
Carrie L. Hirtle, Hirtle	2950
Cecil L. Beck, Heisler	2400
Carranza, Conrad	2500
Clayton W. Walters, Walters	2550
Cento, Fralic	1450
Clark L. Corkum, Corkum	1450
Carl S. Silver	2400
C. M. Walters, Walters	2250
Dorothy Adams, Tanner	2450
Delawana, Himmelman	2850
Donald A. Creaser, Creaser	3450
Donald A. Silver, Walters	3000
Dorothy P. Sarty, Sarty	2800
Elsie M. Hart, Corkum	3650
Evylin B. Miller, Spindler	2850
Itaska, Ritcey	3050
E. B. Walters, Walters	3100
Edyth Newhall, Spindler	3400
Francis W. Smith, Mossman	3100
Frank J. Brenton, Gilfoye	2100
Golden West, Getson	1100
Granite, Richards	2700
Grace Hilda, Conrad	2600
Gladys Mosher, Mosher	3350
Glacier, Knock	3650
Glooming, Richards	3000
G. A. Rhuland, Myra	2350
H. H. McIntosh, Spindler	3500
Hawanee, Cook	3400
Hazel E. Herman, Herman	2400

J. D. Hazen, Himmelman	3025
James Douglass, Ronkey	3750
Jennie E. Ritcey, Ritcey	3300
J. B. Young, Himmelman	3100
J. W. Margeson, Corkum	2600
J. Henry McKenzie, Weinacht	3200
Kathleen Creaser, Creaser	2900
Lillian B. Corkum, Corkum	3700
Lauretta Francis, Spindler	3200
Lucille M. Smith, Beck	3200
Lewis H. Smith, Westhaver	2650
Lucille M. Schnare, Schnare	2500
Lucille B. Creaser, Creaser	3350
Layola, Fralic	1000
Lucille M. Colp, Colp	4700
Laberge, Corkum	3120
Monarchy, Lohnes	850
M. M. Gardner, Bachman	3350
Marian Adams, Knickle	2900
Marjory E. Bachman, Bachman	3200
Mantanzas, Oickle	3000
Muriel E. Winters, Winters	3450
Marian Mosher, Shupe	3350
Muriel B. Walters, Walters	2500
Mary D. Young, Knickle	2100
Mark H. Gray, Mason	3000
Norma P. Coolen, Coolen	2050
Norma L. Conrad, Conrad	3100
Otokio, Ernst	1450
Pasadenia, Wentzel	2350
Phylis L. Westhaver, Westhaver	2100
Pearl Beatrice, Hubley	400
R. L. Borden, Himmelman	3650
Revenue, Zink	2450
Review, Bushen	1650
Silver Thread, Getson	2350
Silver Oek, Lohnes	450
Tipperary, Walters	1750
Uda A. Saunders, Spindler	2600
Vivian P. Smith, Mack	3200
Vera E. Himmelman, Conrad	1600
Watauga, Zink	2850
William C. Smith, Selig	3400
W. H. Smith, Wharton	3800
Warren G. Winters, Allen	2150
W. C. McKay, Deal	3500
W. G. Robertson, Publicover	2150
A. Hubley, Hubley	1170
W. T. White, Corkum	3350
Elsie Porter, Eisenhauer	3100
Grand total—256,215 quintals.	

BOSTON'S FISH WEEK.

"The Food Facts Bureau of the Boston Women's City Club held a fish week in September. The Bureau of Fisheries contributed large numbers of its economic circulars and other publications, which were given to persons attending the lectures on the preparation of fish.

"In addition, the Food Facts Bureau sent out much printed matter in response to inquiries and requests by mail. It is estimated that nearly three hundred people were in attendance at the Bureau each day during the week, and the campaign in behalf of increased fish consumption was well received."



Fleet of Fishing Vessels in Lunenburg Harbour, N.S.

Perhaps no picture we could show would demonstrate more clearly the commanding position occupied in Canada by

B-H Anchor **MARINE PAINTS**

Of this fleet of fishing vessels taken in Lunenburg Harbour, the great majority were painted with **B-H ANCHOR MARINE PAINTS**.

For more than 30 years we have specialized in Marine Paint making with the result that our paints for Marine purposes are being supplied in great quantities today to fishermen and shipbuilders throughout Canada.

Among the varieties we manufacture are:

Hull Paints
Deck Paints
Marine Zinc White
Cabin Enamels
Copper Paints
White Lead

Anti-Corrosive Composition
Anti-Fouling Composition
Lower Hold Composition
Engine Enamels
Aluminum Paints
Red Lead

BRANDRAM-HENDERSON LIMITED
MONTREAL HALIFAX ST JOHN TORONTO WINNIPEG CALGARY EDMONTON VANCOUVER

Billingsgate Market Report

London, October 27th 1917.

During the past week the aggregate deliveries of all kinds of fish at Billingsgate Market have been comparatively generous, exceeding 500 tons on most days. As herrings, and to a lesser extent mackerel, have bulked largely in deliveries, however, the quantities of trawled fish available have been rather on the light side, and prices have ruled at a substantial level. At the week-end several trucks of loose trawled fish were received by a well-known firm from the Naval Authorities at an Essex port, and these proved very acceptable to the trade, especially the haddock smokers. Fresh haddocks have averaged about 10/6 per stone, and cod much about the same rate. Prime fish—soles, turbot and brills—have been at famine values and no kind has been cheap, even such fish as dogfish, monkfish, catfish and colafish, which previous to the war were almost worthless, and foted a drug, commanding from 4/- to 10/- per stone. Now that the season for home-caught salmon has closed the inquiry for frozen salmon is falling off, but this trade is not quite so inactive as is usual at this season. No doubt the shortage and consequent high prices of all kinds of deep sea fish is concentrating more attention on frozen salmon. Prices for frozen salmon range from 1/- per lb. where fish are purchased ex-stores by the whole case up to 1/8 per lb. for single fish of selected weights.

Supplies at all the coast ports, Grimsby, Hull, Aberdeen, Fleetwood, Milford Haven, etc., have gradually fallen away as the week progressed, the gales hindering fishing operations, and prices have risen in sympathy with the lighter deliveries. Cod appears to have been the principal variety landed at most ports, but haddocks have been short of requirements. Flatfish have been uniformly scarce and dear.

At this time of the year the great Autumn herrings fishing at the two famous East Anglian ports of Great Yarmouth and Lowestoft is in full swing, but the fleets now operating are but a shadow of those working the herrings grounds in normal times. On several years prior to 1914 the number of drifters, steam, sail and motor, fishing out of these two ports ran into four figures. Buyers have scrambled for the herrings brought in with the result that prices have been forced up to an unremunerative level when the returns from the consuming centres are considered. The appetite of curers for fish for kippering and the bloating for the requirements of H. M. Forces is almost insatiable, and this handicaps firms catering exclusively for civilian demands.

Trade in the principal provincial cities and towns has been fairly active at the high price ruling.

The immediate outlook is not particularly bright. The weather has been very stormy throughout the past week, and although this has allowed Londoners to sleep soundly o' nights without fear of aerial marauders fishing operations have been hampered. Big prices may be expected to rule for some days now and holders of frozen halibut and other Canadian fish should benefit accordingly.

London, November 3rd, 1917.

Following a period of stormy weather, the general supplies of fish landed at the various fishing ports in the United Kingdom have been of meagre proportions this week. At Grimsby, the premier fishing port

in this, or in any other country, for the matter of that, for instance, there was not a single arrival on Tuesday last. Naturally, with supplies at a famine level, prices have ruled extremely high, owing to keen competition among buyers. The public has not fully responded to the increased cost of fish, with the result that the high rates have checked demand and business has not been particularly remunerative to distributors. At Grimsby, fresh haddocks have gone out regularly round 15s per stone, while at Hull the figures have varied between 10s and 18s. At Aberdeen rates have ranged round 10s per stone. Except on Tuesday, when 20s per stone was touched on a few occasions, quotations at Billingsgate have not been in harmony with cost values, and the provincial markets have often been below cost price. Flatfish of all kinds have changed hands at extremely big prices, while the commoner kinds, used by friers and cut-away fishmongers in working class districts, have been uniformly expensive. Herrings have been more prominent than trawled fish, and on the whole have gone out pretty freely, although at high prices, and smoked fish—kippers and bloaters—have risen in value in sympathy.

Despite the scarcity of fresh fish, trade has not been fast for frozen fish; salmon has sold slowly, the range in prices being from 1s to 1s 8d and 1s 9d per lb., while frozen fresh haddocks have been offered by importers, by the base, at 7d per lb., but there has not been any rush for them.

The following list of typical quotations at Billingsgate in November over a series of years, which I have specially compiled for the "Canadian Fisherman," are of interest as showing the extent to which prices of fish have advanced in this country. Two of the years—1908 and 1912—were normal times in the pre-war period, and thus are compared with the first year of the war, and this year.

Billingsgate Prices.

	1908	1912	1914	1917
	Supply	Supply	Supply	Supply
	654 tons.	566 tons.	482 tons.	428 tons.
	per lb.	per lb.	per lb.	per lb.
Soles	1s 3d	1s 7d	1s 9d	4s 6d
	Stone.	Stone.	Stone.	Stone.
Turbots	10s 6d	12s 0d	13s 9d	31s 0d
Plaice	4s 9d	5s 3d	8s 9d	19s 6d
Halibut	6s 9d	9s 6d	13s 3d	32s 6d
Cod	8s 0d	3s 9d	7s 0d	14s 9d
Haddock, fresh . .	1s 7½d	2s 6d	5s 0d	10s 6d
Dogfish	Nominal value only			10s 0d
Monkfish	Nominal value only			9s 6d

From these figures it is pretty evident that there is a fine opening for Canadian fish on our markets if it is marketed in prime condition at reasonable figures, but this will be useless apart from a well-defined publicity campaign.

TINPLATE SUPPLIES FOR CANADA.

As the readers of Canadian Fisherman know, the users of tinsplate have had considerable trouble in securing their supplies since the war began, more especially since the United States have entered the war.

The Department of Trade and Commerce is, working in conjunction with a committee of prominent manufacturers, among whom is Mr. Fred R. Whittall, managing director of the Whittall Can Co., Ltd., Montreal, endeavoring to hurry along tinsplate supplies for Canada.

LION BRAND CORDAGE Stands the Strain

“Lion Brand” was used for all the operations in the successful erection of the Quebec Bridge.



As one of the world's engineering feats this stands to the front. Brains, Energy and Lion Brand Cordage all produced in Canada.



:: :: Vessels and Fishermen :: ::

:: :: Should Use Lion Brand :: ::

CONSUMERS CORDAGE COMPANY, LIMITED
MILLS AT DARTMOUTH, N.S., AND MONTREAL BRANCHES AT TORONTO AND ST. JOHN, N.B.

Tees & Perase, Limited, Winnipeg, Regina, Saskatoon, Calgary, Moose Jaw, Edmonton
and Fort William, Ont. James Bisset & Co., Quebec, P.Q.;
Macgowan & Co., Vancouver, B.C.

**HALIBUT ARRIVALS AT WEST COAST PORTS,
OCTOBER 1st TO OCTOBER 31st
INCLUSIVE.**

AT PRINCE RUPERT, B.C.

- Oct. 1.—Bringold, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 1.—Cora, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 2.—J. P. Todd, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 2.—Lincoln, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 2.—Adeline, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 3.—Mayflower, 6,000, The C. F. & C. S. Co., Ltd.
 Oct. 4.—Shamrock, U.S., 13,000, The C. F. & C. S. Co., Ltd.
 Oct. 5.—Livingston, U.S., 18,000, The C. F. & C. S. Co., Ltd.
 Oct. 6.—Alten, U.S., 45,000, Booth Fisheries Company.
 Oct. 6.—Fram, U.S., 4,000, Booth Fisheries Company.
 Oct. 6.—Agnes B., 5,500, The C. F. & C. S. Co., Ltd.
 Oct. 9.—Karl F., 7,000, The C. F. & C. S. Co., Ltd.
 Oct. 9.—Margaret G., 6,000, The C. F. & C. S. Co., Ltd.
 Oct. 10.—Geo. E. Foster, 20,000, The C. F. & C. S. Co., Ltd.
 Oct. 10.—Convention, U.S., 4,000, The C. F. & C. S. Co., Ltd.
 Oct. 10.—North Cape, U.S., 4,000, The C. F. & C. S. Co., Ltd.
 Oct. 11.—Venus, U.S., 12,000, The C. F. & C. S. Co., Ltd.
 Oct. 11.—Sitka, 41,000, The C. F. & C. S. Co., Ltd.
 Oct. 11.—Andrew Kelly, 15,000, The C. F. & C. S. Co., Ltd.
 Oct. 11.—Tomandal, U.S., 20,000, The C. F. & C. S. Co., Ltd.
 Oct. 12.—Ringleader, 6,000, Dybhaven.
 Oct. 12.—Director, U.S., 11,000, Dybhaven.
 Oct. 14.—Lincoln, U.S., 10,000, Atlin Fisheries Limited.
 Oct. 14.—Eureka, U.S., 5,000, Atlin Fisheries Limited.
 Oct. 14.—Tahoma, U.S., 5,000, Atlin Fisheries Limited.
 Oct. 16.—Saturn, U.S., 5,000, Dybhaven.
 Oct. 16.—Corona, U.S., 7,000, Dybhaven.
 Oct. 16.—Adeline, U.S., 5,000, Dybhaven.
 Oct. 16.—Alliance, 3,500, Dybhaven.
 Oct. 16.—F. C. Hergert, 8,000, The C. F. & C. S. Co., Ltd.
 Oct. 16.—Gilford, 10,000, The C. F. & C. S. Co., Ltd.
 Oct. 16.—Ed. 3,000, The C. F. & C. S. Co., Ltd.
 Oct. 16.—Chief Zibassa, 10,000, The C. F. & C. S. Co., Ltd.
 Oct. 18.—Alaska, U.S., 20,000, Booth Fisheries Co.
 Oct. 18.—Elfin, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 18.—Todd, U.S., 10,000, The C. F. & C. S. Co., Ltd.
 Oct. 18.—P. Doreen, 9,000, The C. F. & C. S. Co., Ltd.
 Oct. 19.—Agnes B., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 19.—Selma, U.S., 3,000, Booth Fisheries Co.
 Oct. 19.—Stranger, U.S., 4,000, The C. F. & C. S. Co., Ltd.

- Oct. 19.—Margaret G., U.S., 6,000, The C. F. & C. S. Co., Ltd.
 Oct. 19.—Jas. Carruthers, 80,000, The C. F. & C. S. Co., Ltd.
 Oct. 21.—Grier Starrett, 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 21.—Convention, U.S., 18,000, The C. F. & C. S. Co., Ltd.
 Oct. 21.—N. & S., 7,000, The C. F. & C. S. Co., Ltd.
 Oct. 21.—Ruria, 4,000, The C. F. & C. S. Co., Ltd.
 Oct. 21.—Carlotta G. Cox, 20,000, Atlin Fisheries Limited.
 Oct. 22.—Thelma, U.S., 7,000, The C. F. & C. S. Co., Ltd.
 Oct. 22.—Shamrock, U.S., 10,000, The C. F. & C. S. Co., Ltd.
 Oct. 24.—Soya, 3,000, Atlin Fisheries, Limited.
 Oct. 25.—Karl F., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 25.—Illa, 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 25.—Rainier, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 26.—Vanseer, U.S., 60,000, Booth Fisheries Co.
 Oct. 26.—Rainier, U.S., 5,000, The C. F. & C. S. Co., Ltd.
 Oct. 27.—Bringold, 4,000, The C. F. & C. S. Co., Ltd.
 Oct. 28.—Seymour, U.S., 35,000, The C. F. & C. S. Co., Ltd.
 Oct. 29.—Yakutat, U.S., 22,000, The C. F. & C. S. Co., Ltd.
 Oct. 30.—New England, U.S., 110,000, Atlin Fisheries Ltd.
 Oct. 30.—Tom & Al., 80,000, The C. F. & C. S. Co., Ltd.
 Oct. 30.—Livingston, U.S., 27,000, Royal Fish Company.
 Oct. 30.—Margalice, 7,000, Booth Fisheries Co.
 Oct. 30.—Lincoln, U.S., 7,000, Booth Fisheries Co.
 Oct. 30.—Hilda, U.S., 5,000, Booth Fisheries Co.
 Note:—Vessels not specified "U.S." are of Canadian Registry.

AT KETCHIKAN, ALASKA.

- Oct. 4.—Manhattan, U.S., 85,000, New England Fish Co.
 Oct. 6.—Knickerbocker, U.S., 5,000, New England Fish Co.
 Oct. 10.—New England, U.S., 100,000, New England Fish Co.
AT VANCOUVER, B.C.
 Oct. 2.—Carlotta G. Cox, 50,000, The Canadian Fishing Co., Ltd.
 Oct. 3.—Imperial, U.S., 25,000, New England Fish Co.
 Oct. 10.—Tyee, U.S., 100,000, New England Fish Co.
 Oct. 13.—Celestial Empire, 40,000, The Canadian Fishing Co., Ltd.
 Oct. 25.—Manhattan, U.S., 80,000, New England Fish Co.

STEAM TRAWLING IN CANADA.

Canada has now four steam trawlers in operation. On the Atlantic, the S. S. "Rayondor" is fishing out of Canso, N.S., for the Maritime Fish Corporation, Ltd.; the S.S. "Triumph" for the National Fish Co., Ltd. out of Halifax, N.S., and the S.S. "Orontes" for the A. & R. Loggie Co., Ltd. out of Mulgrave, N.S. On the Pacific, the Canadian Fish & Cold Storage Co., Ltd., are operating the S.S. "James Carruthers" out of Prince Rupert, B.C.

THE
CANADIAN
FISHERMAN

Official Organ of the Canadian Fisheries Association

VOL. IV

MONTREAL, DECEMBER, 1917

No. 12

LION BRAND
CORDAGE
Stands the Strain

"Lion Brand" was used for all the operations in the successful erection of the Quebec Bridge.



As one of the world's engineering feats this stands to the front. Brains, Energy and Lion Brand Cordage all produced in Canada.

CONSUMERS CORDAGE COMPANY, LIMITED

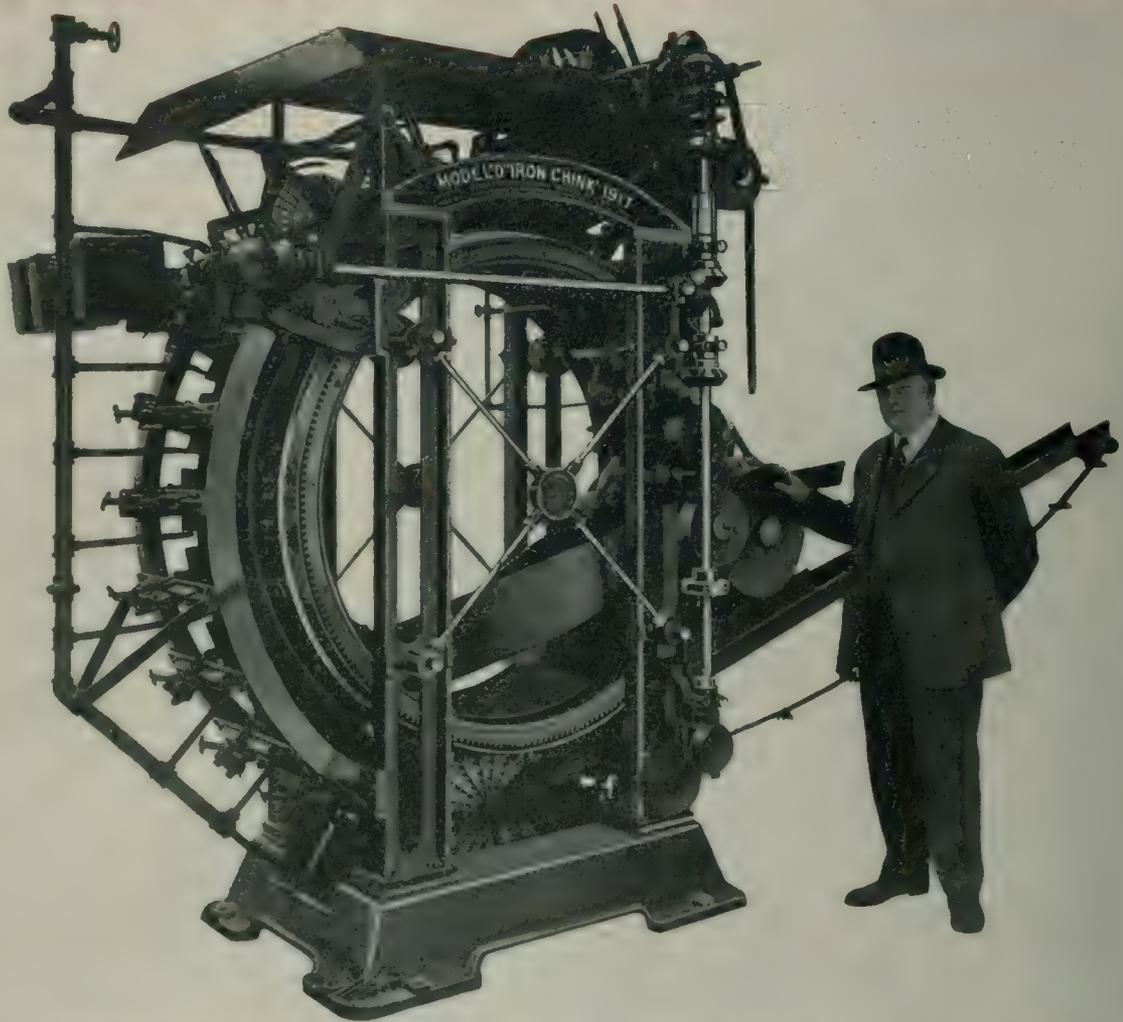
MILLS AT DARTMOUTH, N.S., AND MONTREAL

BRANCHES AT TORONTO AND ST. JOHN, N.B.

Tees & Perse, Limited, Winnipeg, Regina, Saskatoon, Calgary, Moose Jaw, Edmonton
and Fort William, Ont. James Bisset & Co., Quebec, P.O.;
Macgowan & Co., Vancouver, B.C.

PACIFIC FISHERIES SECTION.

The New "Iron Chink"



A COMBINED BUTCHERING, CLEANING AND SLIMING MACHINE. THE ONLY MACHINE OF ITS KIND ON THE MARKET.

For the past fifteen years we have been manufacturing Butchering and Cleaning Machines for use in the salmon industry.

These machines have proven themselves great labor and fish savers and a packing plant is not considered complete without one.

The above illustration shows our latest improved model—one that is far superior to any we have heretofore manufactured.

We are now taking orders for 1918 delivery. Full information, prices, terms, etc., furnished on application.

Smith Cannery Machines Company

PATENTEES AND MANUFACTURERS

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THE CANADIAN FISHERMAN

A MONTHLY JOURNAL DEVOTED TO THE COMMERCIAL FISHERIES OF CANADA AND NEWFOUNDLAND THE SCIENCE OF THE FISH CULTURE AND THE USE AND VALUE OF FISH PRODUCTS - -

F. WILLIAM WALLACE
EDITOR

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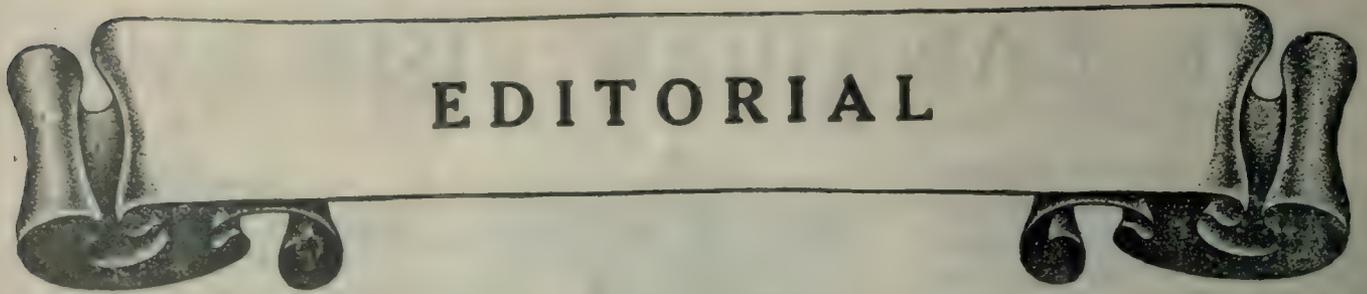
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No. 12

THE Editor and Publishers of the Canadian Fisherman desire to express to their many subscribers and friends, the best and heartiest wishes for Christmas, and prosperity and a speedy ending to the War, during the coming year.



EDITORIAL

THE HALIFAX DISASTER.

No disaster has so universally touched the human heart and stirred the depths of human sympathy as has the explosion of the munition ship at Halifax, which took such a toll of life and property and spread for miles around a plague of suffering and distress which, for days, was so augmented by storms of rain and snow and mid-winter temperatures.

This disaster forms the saddest tale in the annals of Canada. But it also furnishes the finest example of the love and sympathy of which an otherwise cold business world is capable.

Hardly had the echo of the explosion died down before relief trains and boats were hurrying from distant ports to the scene. These were immediately followed by a universal effort to dispatch clothing, foodstuffs and building material, which in turn was followed by an equally universal subscription of money.

In all these efforts the fishing fraternity has been most active. Halifax, the nestor of Canada's Atlantic deep-sea fisheries, meant more to them than to most people. Much of what each has done has gone to swell the results of local organizations, so that the subscriptions which have come to the Secretary of the Canadian Fisheries Association represent only a part of what the members of the Association have given. To date, however, the Secretary has received the following amounts from the branches of the Canadian Fisheries Association:

Canso	\$1,000.00
Digby	100.00
Montreal	780.00
Ottawa	10.00
Toronto	235.00
Prince Rupert	200.00
	<hr/>
	\$2,325.00

A complete report will be given in the next issue of the Canadian Fisherman.

A NATIONAL BLUNDER.

The person, be he minister or departmental official, who is responsible for the wording of the Order-in-Council passed March 9th, 1915, dealing with shipments of fish in bond from Prince Rupert, should be discovered, and if he is still in office, he should be

dismissed. His blunder has been the cause of serious disturbance to the Canadian fisheries of the North Pacific, and since March, 1915, has from time to time threatened the cordial relations the people of Canada are anxious to maintain with their neighbor and ally, the United States. So far as is known, there is no explanation that can be offered for the wording of the preamble in this Order-in-Council. Those who are forced to deal with it can only apologize for it, as has the Honorary Secretary of the Vancouver Branch of the Canadian Fisheries Association, a copy of whose letter to the Pacific Fisherman appears elsewhere in this issue. Such situation is humiliating to Canadian citizens.

The attitude of the United States towards this Order-in-Council was first made known to the British Ambassador to Washington at a conference in 1916 in which Canada was represented by Sir Joseph Pope and Mr. Found, Dominion Superintendents of Fisheries. But the Ottawa Government has simply continued to blink at the whole affair, evidently in the hope that the matter would blow over. The action of a government, however, cannot be dealt with in this way. The expressed intention of the Canadian Government is set forth in the above-mentioned Order-in-Council, and until it is properly dealt with will continue to remain. For the time being the resentment of our good neighbors may be smothered by other considerations, but it will continue to smoulder and may burst into flame later. The proper and statesmanlike way would be for the Governor-General-in-Council to take up the matter and negative the intention expressed in the preamble of its Order of March, 1915.

The report which the United States Government asked should be made by their Bureau of Fisheries, has lately been published in Bureau of Fisheries Document No. 838. The two opening paragraphs of this report read as follows:

"The halibut fishery, not only of Alaska, but of the entire Pacific coast, was in a very disturbed and unsettled condition throughout 1916 because of the alleged efforts of the Canadian Government to divert the trade through Prince Rupert, the terminus of the Grand Trunk Pacific Railway, which is approximately 90 miles southeast of Ketchikan. Much apprehension has been felt by residents of Alaska and by the fresh fish interests of Puget Sound that unless the Government afforded relief through proper legis-

lation the halibut fishery with its attendant incidental trade and benefits to American labor would be almost wholly assimilated by Canadian interests. It has also been felt that along with this would go the loss of American fishermen and their families who would take up their residence chiefly at Prince Rupert, and that most of the fishing vessels would soon be transferred to the British flag.

"It has been said that there has been a well-studied effort upon the part of the Canadian authorities to effect this assimilation of the American halibut fishery. It is a matter of official record, as clearly set forth in the Canadian Order-in-Council of March 9, 1915, one part of the preamble of which in referring to fishing vessels registered in the United States says that under certain conditions a considerable number of such vessels 'would transfer their base of operations from Seattle to Prince Rupert and would probably later transfer their vessels or boats to the Canadian registry and permanently operate from Prince Rupert.'"

ANOTHER BLUNDER THAT SHOULD BE INVESTIGATED.

"The failure of the salmon to run as abundantly in 1917 as in former big years entailed a loss that year to the fishermen and canners of British Columbia of over \$8,000,000, and a loss to the fishermen and canners of the State of Washington exceeding \$19,500,000, and the loss will not be confined to 1917. It will be repeated every fourth year, until such time as the government of Canada and the United States, by united, drastic, and long continued effort, shall succeed in placing on the spawning beds of the Fraser River the equal of the millions of adult salmon that spawned there every fourth year up till 1913." Thus spoke Mr. John P. Babcock, Assistant Commissioner of Fisheries for British Columbia at Ottawa a few days ago.

Mr. Babcock explained that this great national or, as a matter of fact, international loss, was occasioned by the builders of the Canadian Northern Railway, allowing the rock from their cuttings on the banks of the Fraser River to so obstruct that River that the salmon could not get up to their spawning grounds in the year 1913, and "millions of sockeye salmon that year died below the blockade without having spawned."

Some person is responsible for this irreparable loss, and the matter should be investigated without further delay. The obstruction of the Fraser River did not occur over night, but was the work of months, and any one of a number of government officials should have foreseen the trouble that would result from this indifferent filling up of the river.

LACK OF SALT LESSENS FISH PRODUCTION.

One of the fish recommendations which the Canadian Fisheries Association made to the Fish Commissioners after their appointment by the Food Controller, was to arrange for a supply of salt, at all the principal fishing ports, so that when the fish began to run, the quantities taken would not be limited by the supply of salt. It was fully three months later, however, before the Commissioners realized the force of this recommendation and arranged for a supply of salt. This arrived at many ports too late to save large quantities of fish, as may be seen from the review given elsewhere of the industry at Lunenburg. This is only one of the many expressions that have reached this office and which points to neglect on the part of some person.

TECHNICAL EDUCATION FOR FISHERMEN.

This is an old subject with us and it is one which we will never drop until something is accomplished. Our fishermen, more than any others in the world to-day, are remaining in the rut through lack of facilities for technical training in the taking, packing and curing of fish. Japan, that nation of fishermen, realized the advantages of technical training years ago. When Western ideals permeated her deep-rooted and ancient Oriental civilization, she was quick to pick up the best of the utilitarian phases of our Occidental culture.

Students from her colleges were sent at the expense of the Government to British and American shipbuilding yards and machine shops; her seamen were encouraged to sail in foreign ships, and the young Jap was to be found in the colleges and night schools of the Pacific Coast in great numbers. Insofar as the fisheries are concerned, the Japanese have spared no pains to perfect themselves in studies that will develop the resources of their waters to the utmost. Fishery students came to the United States and worked as fishermen on the halibut schooners of the Pacific and the dory trawlers of the Atlantic, and went to England to become acquainted with steam trawling and drifting.

The Japanese are but one nation who have gone in for specialized fishery training. Norway, Sweden, Denmark, Holland, Germany and England are others who have given great attention to the subject. Canada, with at least one hundred thousand persons employed in the fisheries, and possessed of the greatest fishery resources in the world, has done practically nothing along the lines of the technical education of the worker in the fishing industry.

Now, we are well aware of the demands that are made upon the Dominion's finances at the present time, and with a war on, we can hope for no appropriation to further technical training among our fishermen for at least a year to come. The need of tech-

nical training, however, is very great, and in two particular fisheries, it is essential at the present time if we are to hold a trade which we can wrest from the Scandinavians, viz.: dried salt fish and pickled herring in the markets of South America and the United States.

THE FUTURE OF FROZEN FISH.

A great future awaits the introduction of frozen fish to the Canadian public, and the dealers would do well to encourage the building up of this trade. At the present time, there is a strong prejudice on the part of the public to frozen fish, but this is an antipathy which can be dissipated by education and a steady pushing of the product.

A similar prejudice existed in Great Britain with regard to frozen beef and mutton from the Argentine, Australia and New Zealand, but steady work on the part of the great meat firms who handled it, has succeeded in overcoming the popular aversion, and frozen beef and mutton have become staples in the Old Country.

The U.S. Bureau of Fisheries endorse the frozen fish idea, and they have set Dr. Mary Pennington to work analysing and testing various species of frozen fish. It is stated that Dr. Pennington has found frozen fish to be in better condition for food purposes than fish sold fresh at centres distant from the seaports.

This seems natural, as fish placed in the freezer as soon as landed and kept frozen until thawed out by the housewife, is protected from bacteriological deterioration during transit from freezer to market.

As those in the trade are well aware, certain fish will stand freezing better than others. In some species, the tissues break with the frost, but careful study will suggest a remedy. In the meantime, it will be worth while to build up a trade in those fish which stand up well with freezing.

Frozen Saskatchewan whitefish, some two years old, were placed on the table at a London, England, dinner by Major Greene, and the guests vowed it was excellent. Halibut, salmon, mackerel, haddock, herring and smelts, besides various fresh water species freeze well and will keep indefinitely, provided they are not allowed to thaw out.

The advantages of handling fish in a frozen state are manifold. Transportation is greatly simplified, and the loss through shrinkage and deterioration, which is the curse of fresh fish, is done away with, and the retailers' problems are simplified greatly.

The most important factors in the frozen fish trade are in keeping the fish frozen from freezer to housewife, and the proper thawing out of the product by the latter. Frozen fish has been spoiled by improper thawing, which must not be done by the application of heat, but only by immersion in cold water.

Both American and Canadian dealers recognize the value of selling fish in a frozen state, and now is the time to commence a campaign to bring frozen fish before the public.

THE CLOSING YEAR.

The year 1917 has undoubtedly been the most momentous in the fishing industry of Canada. During the year, fish became recognized in its true colors as the only substitute for meats, and the great need of the latter for shipment overseas brought fish foods to the fore. Tuesdays and Fridays were declared as beefless and baconless days by the Food Controller, and fish was suggested as a substitute, and a substitute it has become.

Tuesday is now a recognized Fish Day, and our long task of separating fish from Friday is fast becoming an accomplished fact. We were the first to advocate Tuesday as a fish day, and the Canadian Fisheries Association made a campaign in favor of the day for the past three years with encouraging success. The Food Controller's edict has now succeeded in clinching fish to Tuesday and the fore-end of the week is giving Friday a run for its money. It's here to stay.

The substitution of fish for meat in restaurants and hotels has had the effect of introducing many strangers to the advantages of a fish diet. The fish course is now a staple in most restaurants and is gradually becoming a staple in many homes.

The consumption of fish in Canada has increased from 25 per cent to 300 per cent in many localities and towns, and it is safe to say that on an average the consumption is twice that of pre-war days. The great demand has been on the staples of halibut, salmon, cod, haddock and whitefish, and the two former have gone into the luxury class—not from profiteering, but largely through scarcity of catch, high cost of operations, competitive bidding through keen demand, and increased wages on the Pacific Coast.

While these fish have gone up other lines have held at prices but little over pre-war days. The price to fishermen on cod and haddock has almost doubled on an average, but their cost of operation has been greater. The demand for these fish has been heavy both for home and British consumption, but the catch has been good. Salt cod brought top-notch prices for export and the catch was a record considering the smaller fleet engaged.

The two steam trawlers operating out of Nova Scotia made a good year with heavy landings. Another trawler, the "Orontes" has been added to the Atlantic fleet during the year, and has augmented the supply.

The heavy shipments of frozen fish to Great Britain continue and a great many varieties not marketed in Canada are being caught and shipped. Fish is still being contracted for in supplying the Canadian troops

at home and overseas, and the United States market is calling for increased quantities of Canadian fish since the entry of the States into the war and their Food Administration's campaign in favor of fish as a meat substitute.

A disturbing element in the fresh water fish trade has been the adventure of the Ontario Government into the fish business. While the purpose is laudable enough, yet the methods of distribution are to be deprecated as being Bolshevik in its relation to fishermen, wholesalers and retailers in Ontario. Through a subsidized fishery, whitefish in irregular supply is being retailed at less than cost and brought into competition with fish produced through the regular channels—diverting the latter to the United States. In the Western Provinces, the Food Controller has adopted a fairer scheme by regulating the prices of winter caught fish, and the trade are satisfied that the measure was a necessity and a war-time act. Ontario might have done the same and whitefish would have been retailed at fair prices with a legitimate profit to all handlers—part of which would have been returnable to the State in war taxation.

On the Pacific Coast, the four-year salmon run was a failure and resulted in competitive bidding between U.S. and Canadian packers for Fall salmon to complete contracted packs. As high as 70 cents apiece were paid for dog salmon, and the price of all other salmon lines were boosted by the fishermen. Halibut is becoming scarcer, and the fishermen are getting high prices through competitive bidding for their catches. Legislation to protect the halibut is being seriously mooted and will probably be introduced during 1918.

The Food Controller is making arrangements to find a market for Pacific "scrap fish"—the cods, flounders, soles, grey-fish, also herring and oolachons—and negotiations are at present under way for an agreement on price to all handlers. The Government intend to help the business by paying two-thirds of the transportation charges on these fish to the eastern boundary of Manitoba in order that a market may be made and cheap fish introduced to the Western consumers. This will be the salvation of the Pacific fisheries as the halibut cannot be depended upon for all time, and close season legislation will probably cut down the catch.

A Commission investigated conditions in the salmon canning industry of District No. 2 in British Columbia during the summer, and made an exhaustive report which is now before the Marine and Fisheries Department. A decision will probably be announced early in the new year.

The Food Controller has assisted the consumption of fish greatly by advertising campaigns and the distribution of fish display cases to retailers at half-price. Transportation has been facilitated by him, and many

restrictions on fishing waters has been raised to increase production during the war on his recommendation.

The Canadian Fisheries Association and this magazine conducted a campaign for increased fish production during the summer with eminently satisfactory results. The Association has been of great assistance to the Food Controller and has placed all its officials at his service. This organization of the fishing industry has been of inestimable benefit to its members and the fishing industry in general. Plans for the future will be undertaken in greater magnitude and a carefully organized policy for the development of the industry will be carried out.

The year has been one of progress and the future augurs well. Here's to 1918 and the biggest year of all!

A MENACE TO CANADA.

It is an undoubted fact that an attempt so extensively organized and so deliberately carried out as to make its origin easily attributable to enemy agents has been made in Canada to discredit the Food Controller and to check-mate his efforts along the line of conservation. Stories without even a vestige of foundation have been scattered broadcast. Nor have they come to life casually. They have started simultaneously in different parts of the country, and in each instance have been calculated to arouse public indignation. These untruths, intangible quantities though they be, have the power of destruction that lies in a battalion of soldiers. They are insidious, subtle, persistent. Bit by bit they dissipate public trust, the great essential in the work of food control. They hamper the work of the Food Controller. It lies with every individual to forbear from criticism; to refrain from passing on the vagrant and harmful story; and thus the more effectively to co-operate in work, which is going to mean more than the majority of people yet realize.

TO MARKET ALL EDIBLE FISH.

The Food Controller is planning to find and create markets in Canada for those fish which are at present thrown away or split and salted for export. Samples of fresh pollock and sea cat-fish were tried by the Food Controller's staff at recent luncheons, and both were declared delicious and well worth placing upon the market. Skate, hake, cusk, flounders, soles, eels, burbot, greyfish, silver hake, herring, grey, red and ling cod and oolachons are among the fish varieties the Food Controller intends to introduce to the Canadian consumer as an alternative to the high-priced halibut and salmon.

All of the fish named are excellent food fish, but largely on account of their appearance, the public has

refused to give them a trial. The heavy demands of the home and overseas markets for certain lesser known fish is causing occasional shortages, but if the lesser known varieties could be introduced there would be a good supply.

The campaign to popularise these fish will commence with the New Year, and with the demand which now exists for fish foods, they should soon become staples and result in the commercializing of a present-day waste or non-utilized product.

AN EARMARK TO PROGRESS.

"I have studied this question for several years and do not think that I have ever found a man consistently reading the trade papers who was not a live wire. On the other hand, I have found that the men who do not read the trade journals are unprogressive." Such is the verdict of Wm. L. Fletcher, Sales Manager of Cutting and Washington, Radio Engineers and Manufacturers of Cambridge, Mass., a man who has had a wide and successful experience in salesmanship.

NEW REGULATIONS FROM FOOD CONTROLLER'S OFFICE.

The maximum price for mullets caught through the ice of the lakes and waters of Manitoba, Saskatchewan and Alberta has been fixed by the Food Controller at two cents at primary railway shipping points. Also that for Southern Saskatchewan lakes half a cent may be added to the prices fixed for winter caught fish at the Big River District. Rumors having reached Food Controller that itinerant American dealers have been offering prices in excess of those fixed, permission to export has been withdrawn until satisfactory evidence to contrary is produced.

DEPARTMENT OF THE NAVAL SERVICE.

Notes on the Results of Sea Fishing Operations in Canada During the Month of November.

On the Atlantic coast sea fishing was carried on during November under rather unfavorable weather conditions, and as a consequence the quantity of the principal kinds landed was barely equal to that landed for the same month last year.

The total catch of cod, haddock, hake and pollock in eastern Canada amounted to 100,564 cwts. This is 5,400 cwts. less than for November, 1916, but almost 18,000 cwts. greater than for November, 1915.

Along the south shore of Nova Scotia, which is the chief producing province of the east, fish were found to be plentiful on the fishing grounds; but results at the different centres varied with the condition of the weather and the amount of bait available. For example, Guysboro county and the counties of Cape Breton Island show an increase compared with the preceding November of 12,900 cwts. of cod, haddock, hake and pollock, while Halifax county and the counties to the westward show a decrease of 20,776 cwts. Gains in some of the other counties, however, reduced the total shortage of these fish in Nova Scotia to 3,242 cwts.

The total value of all fish at the point of landing in Nova Scotia during November this year amounted to \$415,107 against \$295,072 in November last year. The increased value is mainly due to the fact that the price paid to fishermen was 30 per cent higher for cod and 36 per cent higher for haddock than that paid in the preceding November. A comparison of the price paid for these fish in November this year with that paid in November of the pre-war year, 1913, shows an increase of 85 per cent for cod, and 114 per cent for haddock.

The sardine fishery in the Bay of Fundy resulted in a catch of 23,965 barrels, against 22,685 barrels for the same month last year.

The new lobster fishing season opened in Charlotte and St. John Counties, N. B., on the 15th of the month. The catch amounted to 1,080 cwts., against 1,726 cwts. for the same period in the preceding year.

Very little fishing was carried on in any part of the Gulf of St. Lawrence other than for smelts and oysters. The smelt fishery produced 2,598 cwts., while last year in the same month 3,510 cwts. were taken. The price paid to fishermen for smelts so far this year is 43 per cent higher than last year, and 83 per cent higher than in 1913.

Two fishermen of Cape Breton County, N. S., and one fisherman of St. John County, N. B., were drowned in the course of the month.

On the Pacific coast weather conditions, generally, were not very favorable for fishing.

Fall salmon fishing during the month resulted in a catch of 168,404 cwts., against 96,079 cwts. for the same period last year. The price paid per cwt. to fishermen for the increased catch was 75 per cent higher.

Herring were caught in fair quantities at Nanaimo, Cowichan Gap, Nanoose Bay, and Alberni Canal. The catch for the month amounted to 89,247 cwts., against 71,374 cwts. for the same month last year, while the price to fishermen is 100 per cent higher this year than last.

The quantity of halibut landed during November was 13,030 cwts., against 15,989 cwts. during November, 1916, and 26,415 cwts. during November, 1915. A stoppage of railroad traffic out of Prince Rupert, due to a slide, caused a number of halibut fishermen to land their catches at southern ports for a part of the month.

The total value of fish landed in British Columbia during November was \$1,599,031, against \$586,509 during the same month last year.

The total catch of sea fish in the whole of Canada during the month realized a value of \$2,145,240 at the point of landing. In November last year the value amounted to \$1,074,398.

NEW CANNING ENTERPRISES.

Jackfish or pike from the Northern Lakes of Alberta is now being canned by the Athabasca Fish Company of Edmonton. The fish are being put up in sanitary cans and are quoted at \$2.10 per case of 1 doz. 1 lb. talls, f.o.b. Edmonton. Greyfish is being canned in Prince Rupert and is quoted by Nickerson & Co. at about \$5.00 per case of 48 one-pound talls f. o.b. Rupert.

Fish chowder, made from cod cheeks is being canned in Nova Scotia by A. P. Tippet & Co., Montreal, and is an excellent line.

The Vancouver Branch of the Canadian Fisheries Association Replies to the Contention of United States Fishing Interests re Prince Rupert Dispute

Vancouver, B.C.

The Editor.

The Pacific Fisherman.

Dear Sir,—Your article on pages 14 and 15 of your issue of September headed "Official statement on Prince Rupert Question," has interested the fishing men of British Columbia, and a canvas of those engaged in the fishing and canning industry has resulted in the elucidation of points of view that may be worth your consideration and on publication, worthy of the serious contemplation of your many and influential readers.

In the first place, let it be admitted at once, that the clause in the Order-in-Council of March 9, 1915, referring to the transfer of American vessels to Canadian register, should never have been used; first, because such transfer was never considered by the Canadian fishing industry, and second, because it is manifestly offensive to the free people of our sister Nation. Had that clause not appeared in this Order-in-Council, the argument you have so pertinently extended would have had no apparent foundation in words, as I hope to show it has no basis in reality.

Who drafted the order-in-council with the offensive clause—the wholly unnecessary and uncalled-for clause—is no more a mystery than that typographical errors creep into your excellent magazine. That clause should have been excised before the order-in-council was promulgated. The sooner the order-in-council is amended by the excision of that hateful clause, the better pleased will be the fish men of British Columbia.

So much for the amende honorable to the amour propre of our cousins to the South.

It is right for me to assume that if that clause were omitted from the order-in-council, then the order-in-council would have met with the approval of the fishing interests in the United States, for its operation and its intention are to grant benefits to United States halibut fishermen and vessels.

As to the order-in-council of January 31st, 1916, relative to bait, while it was a new feature, yet it did not take any rights from United States halibut fishermen and vessels, but rather extended to them valuable concessions if they cared to avail themselves of them.

I will be glad if you and your readers of this article will appreciate the fact that in all that has been done by Canadian orders-in-council, no compulsion has been suggested; privileges have been offered, and it has been left to the United States halibut fishermen and vessels to take advantage of them of their own free will and accord. With this fair understanding, cordial co-operation in thinking may be achieved. With the fallacious suggestion that the Canadian orders-in-council have been promulgated to coerce United States halibut fishermen and vessels to trade with Prince Rupert and not with Seattle or Ketchikan, neither

you nor I can be a party. For the indisputable fact is that the freedom of the United States halibut fishermen and vessels and of the seas, is in no way interfered with by Canadian governmental regulations.

That the privileges extended freely by the Canadian orders-in-council to the United States halibut fishermen and vessels were appreciated by them as beneficial commercial aids is admitted by you when you say that the United States vessels landed at Prince Rupert in 1915, 7,000,000 lbs. of halibut and in 1916, 13,000,000 lbs. That United States halibut fishermen and vessel owners should protest against this, when they benefit from it, seems hard to understand. That Seattle fishing interests may be affected by the transfer of so much of the halibut trade from Seattle to Prince Rupert is more evident and more easily understood; but if they were benefited by the transfer they would not surely protest. As a general proposition we must all agree that those who benefit from the privileges extended by Canadian orders-in-council do not protest. They say protest who cannot avail themselves of these free privileges.

The question arises, then, whether Canada should abrogate these order-in-council and in doing so please certain United States fishing interests and displease certain other United States fishing interests; or whether Canada should continue to offer the present privileges free to all who care to take advantage of them. It seems potent that Canada's position is eminently fair and friendly in this present matter.

In particular, the fish men of British Columbia say that the obnoxious clause in the order-in-council of 1915 is of no interest to them; they were never consulted about it, all they desired was that United States halibut fishermen and vessels might have the privilege of landing their catches at Prince Rupert and shipping them in bond to United States points. That was a concession to the United States fishing interests. Canadian interests are as anxious as the United States fishing interests to see that clause disappear from the order-in-council, and it will.

What is the reason that Prince Rupert is the centre of the deep sea fishing of the Northern Pacific Coast? You quote E. J. Brown as saying: "The Canadian advantage is considered to be the result of artificial stimulus by way of governmental regulations." He says it is not one of geographic position, of superior transportation facilities.

We have referred to the governmental regulations, they are embodied in the orders-in-council. What made Seattle the centre of the Pacific halibut fisheries for twenty years prior to 1915? Surely it was geographical position, superior fleets, fishermen and methods, and superior transportation facilities. Two things have made Prince Rupert the new centre for the Pacific deep sea fishing trade, 1st—the fact that it is nearest to the greatest supply of fish, and secondly, that the Grand Trunk Pacific is now a finished

transcontinental railway with connections over all America. What Seattle was fifteen or twenty years ago, Prince Rupert is to-day. With all due respect to Mr. Brown, the habitats of the halibut, the geography of North America and adequate transportation facilities have combined to create a condition whereby a Canadian city has a fishing port advantage. Governmental regulations will not make the halibut migrate to more southerly feeding grounds. And giving Ketchikan and Prince Rupert similar facilities, one can easily imagine that the terminal of the transcontinental railway will still be the Mecca for the fishermen on their own initiative. It has been the superior fleets, fishermen and methods of the former fishing fleet of Seattle that have taken advantage of the natural conditions in the Northern Pacific waters to trade to and out of the port of Prince Rupert, and the advantage has not all been on the side of the Canadian city, as the United States halibut fishermen and vessel owners can testify.

So far as the pre-eminence of Prince Rupert over Seattle, as the halibut fishing centre of the Pacific is concerned, it is a matter of creative geography, and the act of creation was performed millions of years ago, once and for all. In regard to Ketchikan there may be another story. There is no good reason why there should not be a United States port and a Canadian port for the halibut fisheries of the Northern Pacific. That is a matter of business for the interests in each country to work out. There is no bar so far as Canada is concerned to the development of a great halibut fishing port at Ketchikan. To the casual observer it would seem strange that it has not been done already. Public and public enterprise, of which our cousins to the South have ample, has an opportunity for a wide swing in this direction. And I know of no more opportune time, when greater food production is desired in our united efforts to win the war, than the present for action along this line.

But in fairness, let not the Canadians be blamed for developing their own port at Prince Rupert. Even the halibut fisheries at Prince Rupert are doing something to feed the allied nations at the moment. And to say that a paltry order-in-council or two can create a great fishing centre is to go back on the teachings of history and make the world unlearn all it has been taught. Governmental regulations may assist conditions, but only enterprise and energy will establish any great industry on a permanent basis.

There seems no danger of the halibut supply caught in the United States waters and its cost to United States consumers passing from the United States to Canada. There is only one big Canadian fishing company competing with five or six United States concerns at Prince Rupert. The fish caught by independent boats is offered for sale in the open market. Every company has the same opportunity to bid for it. It is inconceivable that that one Canadian Company can debate the price, the Booth Fisheries, the Atlin Fisheries or the National Independent Fisheries, must pay for halibut. It is in no more advantageous position than are the United States. Its government subsidy was paid years ago, and it is no longer in receipt of governmental assistance. It has to stand on its own feet in the face of the keenest possible competition from large United States fishing concerns that had achieved manhood in business before the Canadian Fish and Cold Storage Company was in-

cubated. Let not bugaboos frighten the innocent United States consumers. The price of fish will be ruled by the law of supply and demand, with the aid of Hoover and Hanna. Through business foresight and fortunate circumstances, the Canadian Fish and Cold Storage Company was in business in a big way with its plant, with a capacity of 14,000,000 lbs., when the halibut, geograph and railway facilities combined to create Prince Rupert into the deep sea fishing centre of the Northern Pacific. That is the condition. It isn't any argument. It is a fact.

Now, the United States fishing companies which have buyers and fish houses at Prince Rupert have been fairly treated by the Canadian Fish and Cold Storage Company, which has supplied them with ice either crushed or in block at \$3.00 a ton, a price as cheap as found anywhere on the Coast. No advantage has been attempted to be taken by the Canadian Fish and Cold Storage Company of its competitors. No United States halibut fishing boat has been refused ice at the Company's plant, nor has it ever been stipulated that ice and bait would be supplied only if the boat bought its other supplies in Prince Rupert. T. H. Johnston, General Manager of the C. F. & C. S. Company is the authority for this statement. It is even said that Capt. Bernhoft, who is said to have been refused ice, but who really himself refused to buy ice and bait in Prince Rupert, proceeded to Ketchikan for his supplies and then returned to Hecate Straits, Canadian waters to catch his halibut. But enough of that, for it is dealing with trivialities. Modern business thrives on service and the fishing concerns at Prince Rupert are nothing if not modern.

Mr. Brown refers to the culling of halibut. "It is not the custom in Prince Rupert to cull the catches of fish as it is the custom on the American side of the line." This culling is a moot point with the halibut fishermen. They seem to be satisfied with the methods adopted in Prince Rupert, by all the fishing houses, both Canadian and United States. It is different from the method in Seattle and Ketchikan, and the fishermen prefer it.

It seems evident that if the United States buyers are to take advantage to the full of Prince Rupert as the natural centre of the Pacific halibut industry, from the statements published in your paper, they must erect cold storage and freezing plants there or locate in United States territory and create a new fishing centre. That states the situation. The great halibut market is already established at Prince Rupert, just as on the Atlantic, Boston is the centre of the deep sea fishing. Other centres have arisen on the Atlantic Coast, but Boston still leads; and that deep sea fish market has not been created solely through governmental regulations. The facts state the case strongly enough without dragging in the bugaboos of "The fear of ultimate Canadian assimilation and impossible conditions because of subsidies and other governmental regulations, favorable to Canadian interests." These are specious arguments tending to prejudice impartial judgment.

In a word, Prince Rupert is a free port to United States halibut fishermen and vessels where special privileges by orders-in-council are given to our cousins to the South. There is no compulsion on the part of Canada. Nature and natural progress have ordained that Prince Rupert be the centre of the Pacific halibut industry, and the right to trade freely in that

centre is extended to the United States fishing interests. If restrictions were imposed on the United States fishing interests one could understand the case as you have presented it, but when the greatest consideration is voluntarily tendered to United States fishing interests, one is at a loss to understand the elaboration of trivialities to make a fair case cloudy.

However, finally and in particular, the whole-hearted entry of the United States into this world-war, shoulder to shoulder with the Allies, has warmed the hearts of Canadians, and he who suggests international offence where none is intended does a service to his country at this time. Any movement that will disorganize an established international trade that is doing national work in increasing the production of fish for food-stuffs during the war, must be prepared to withstand criticism from all citizens, both in the United States and Canada, who desire first that this war shall be won by the Allies.

Canadians will be glad if United States interests can establish a fishing centre in United States territory adjacent to the halibut banks. It is the undoubted and acknowledged right of the United States fishing interests, and in no way would Canadians think of interfering with it. But Canadians maintain that their attitude toward the halibut fishing centre at Prince Rupert should be viewed in its true light, and that fair dealing without the slightest shadow of compulsion, should be considered meritorious rather than be construed into insidious means of unfavorably affecting United States fishing interests, whose presence in Prince Rupert is of common advantage, with detriment to none.

Yours faithfully.

WM. HAMER GREENWOOD.

Hon. Secretary,

The Vancouver Branch of the
Canadian Fisheries Association.

DEPARTMENTAL ANNOUNCEMENT.

Sir,—Adverting to my letter of the 24th October ultimo, with regard to the new arrangement for the transportation of fish from the Pacific coast to points in the three Prairie Provinces, by which this Department would pay two-thirds of the transportation charges on the different kinds of cod and flounders, as well as grayfish, I now beg to inform you that by Order-in-Council of the 8th instant this arrangement has been amended so as to authorize the payment of two-thirds of the transportation charges on all shipments of British Columbia fish, other than halibut and salmon.

It is hoped that with this assistance the dealers on the Pacific coast will be able to work up an important demand in the western provinces for other varieties of fish, such as herring, oolachans, skate, etc.

I am, Sir,

Your obedient servant,

G. J. DESBARATS,

Deputy Minister of the Naval Service.

REPORT ON FISH HATCHERY AT BELLEVILLE, ONTARIO.

Reports from the Thurlow Hatchery, near Belleville, Ontario, which have reached the Department of the Naval Service, show that an eminently successful whitefish egg-collecting season there has come to a close. The best collection of any previous year has been increased by 50 per cent, and the Thurlow Hatchery, which can handle 100,000,000 whitefish eggs, has been filled to capacity and 50,000,000 additional eggs have been sent to the hatchery at Sarnia.

This result is clear evidence of the effectiveness of the fish breeding work in Lake Ontario. A few years ago this lake was regarded as practically depleted of whitefish; now the catches are well over a million pounds per year and are rapidly increasing.

Whitefish eggs for propagation purposes were first collected in the Bay of Quinte in 1906. For several years the collection of such eggs in this area did not exceed 30,000,000, although no commercial fishing was permitted in the Bay during the month of November, and the only nets authorized for whitefish were those that were fished for hatchery purposes. The Bay has been systematically stocked with fry and whitefish have become so abundant that this season the whole Bay with the exception of a small area which is reserved for fishing for hatchery purposes was thrown open for commercial fishing. Notwithstanding the enormous number, taken on their way up the Bay before they reached the hatchery nets, by the commercial fishermen, the fish were so abundant that the best previous collection of eggs was increased by over 50 per cent.

When commercial fishing was not allowed in the Bay, the fish taken in the hatchery nets were liberated after they were stripped of their eggs. In view of the importance of increasing the production of fish and releasing larger quantities of meats for war purposes, the fish taken in the hatchery nets were this season sold after their eggs were procured. The fish were sold at the hatchery to those calling for them for 1c a pound above wholesale prices, and the balance that remained after the local demand was satisfied was sold to the wholesalers. Some 50,000 pounds of fish were disposed of in this way.

LIEUT G. H. FORSTER.

The many friends of Lieut. George H. Forster will be sorry to hear that the Linde Canadian Refrigeration Company, Montreal, of which he was manager, has received a cable that in the recent fighting he was badly gassed. Although his condition is serious, there is hope of his recovery.

Lieut. Forster joined the 148th McGill Battalion, under the command of Lieut.-Col Magee, and left in 1916 for England, but later was transferred to the Imperial Forces.

TRAWLERS BEING BUILT AT GREAT LAKES SHIP YARDS FOR ATLANTIC FISHERIES.

Nine steel fishing steamers are being built at yards on the Great Lakes for Boston owners, the vessels being intended to replace trawlers of this type which have been sold or taken for war purposes. Two wooden steam trawlers are being built at Cape Ann for the Gorton-Pew Fisheries Company.

Mr. H. H. Brittain, Vice-President of the C.F.A., was in a barber shop in Truro, N.S., when the Halifax explosion occurred. He states that the shock was so violent there that everybody ran out into the streets thinking an earthquake was on. Truro is over 50 miles from Halifax.



Lunenburg's Banner Year

"The largest catch in the history of the fleet." Such is the summary of the work of 95 vessels and 1,884 men engaged in the bank fishing industry for the year 1917, and the earning power per capita was \$1.360.

Every year the resume of the banner industry of Lunenburg spells prosperity; this year, however, it is synonymous with affluence.

In 1916, the spring fare was sold for \$7.10 per quintal, the summer for \$7.80, or an average of \$7.50 for the entire season, netting the neat sum of \$1,635,505. Many said then, "It can't last, or at least the end of the high fish prices is in sight."

I remember being in the office of one of the busy fish firms on Montague Street last fall, when prices were being discussed. A noted fish killer, whose luck is proverbial, said: "Don't talk such nonsense, the end is not in sight, far from it; the markets will open in 1917 with the figures they closed with this year. Then watch her climb."

Let us see how his words were verified: In May 1917, \$9.50 was offered for cod, and \$7.50 for scale. There was a break then, but at the last of May, \$9.60 was offered at Lunenburg, and \$9.90 at Halifax. About the first of July \$10.00 was offered at Lunenburg, and \$10.20 at Halifax, later in the same month \$10.25 was offered.

In September \$10.10 was the Lunenburg price, \$10.30 the Halifax one. About the first of November, Lunenburg offered \$10.28 and on Nov. 19, the highest price was paid, \$10.60.

Some climb, when it is considered that ten years ago, \$4.00 or \$4.50 was deemed a good price for salt cod. \$10.60 about that time as a suggested figure for cod would have been voted as lunacy.

But whether figures don't lie, or liars don't figure, here we are with our facts: 1916's catch of 218,060 qls. At an average of \$7.50 per quintal totalled \$1,635,505; 1917's catch, 256,215 qls., at an average of \$10.00, amounts to \$2,562,150, yielding a balance of \$926,650 in favor of the gross earnings of the fleet for the present year. There were eight hand liner's cargoes sold green to the local firm of Robin, Jones and Whitman at \$5.25 per hundred pounds, and two to American markets.

The catch would have been even greater, but the vessels were handicapped by the salt shortage, which obtained in the latter part of August. A number of the schooners had to terminate their voyages on account of lack of salt and the tension in that market was relieved too late to help the fishermen.

Only about a dozen vessels engaged in fall fishing for the same reason and, in a year when fish were

so plentiful and everything was being done to speed up the fishing industry, this shortage was little short of criminal. It is to be hoped, however, that 1918 will see no such negligence; every effort should be used to guard against such a contingency. It is bad enough to have a scarcity of fish; but a plentitude of fish and no means of curing them seems unpardonable.

A glance at the following tabulated statement shows the history of the industry for the past ten years:—

Year.	Vessels.	Quintals.	Average per vessel.
1907	109	123,625	1,134
1908	110	138,180	1,256
1909	93	173,582	1,866
1910	102	216,400	2,051
1911	122	216,450	1,774
1912	136	211,080	1,552
1913	121	211,405	1,747
1914	118	154,065	1,305
1915	118	227,245	1,927
1916	106	218,060	2,060
1917	95	256,215	2,696

It will be seen by the foregoing that the catch per schooner, and the total catch was the largest on record.

The fleet, however, was the smallest this year than for any year since 1909. This was due to a number of causes. Many vessels were engaged in carrying food products to European countries, and in consequence of the extravagant prices offered, a large number have been sold.

The schooner Doris V. Myra, Captain Clarence Myra, when fishing on the spring trip, was run down by a British transport ship, and her crew were carried to Liverpool, England.

This was a big set back, as not only the fine vessel but her catch of 600 quintals was a total loss. Luckily Captain Myra had contracted for a new schooner before leaving on his spring trip, and this having been launched in July he finished up his season with 2,350 quintals, which was good work for the time spent.

February seems to have been an unlucky month for the schooners, as the F. M. Toro was dismasted, and the Henry W. Adams torpedoed in the Bay of Biscay during that period.

Among the schooners sold were the tern Mary D. Young, W. C. McKay, Jennie Ritecy, Marion Silver, Hawanee, Associate, Abyssinia, Wautauga, Mark Gray, Marjorie McGlashen, W. J. White, Assurance, Gigantic, Amy B. Silver, A. H. Whitman, James Parker,

Benevolence, Jennie E. Duff, Marina, Minnie Mosher and Guide.

The crews of the schooners have made tidy sums this year, some of them sharing over a thousand dollars per man, while from \$800 to \$900 was considered ordinary. These sums cover about five months' work, include board, with little or no chance for expenditure.

The wages of headers and throaters, boys ranging from 14 to 18 years, were \$30.00 a month, and the cooks averaged \$100 per month, though some of them got \$120.

Provisions, outfits, etc., have of course been higher, much higher, than in former years, but even so, there



Capt. Maynard Colp of the handliner Lucile Colp high liner of the Lunenburg fleet for 1917.

can be no kick coming from anyone when the cheques are received.

One of the schooners sold, the W. T. White, was bought last fall for \$9,000. She cleared \$8,000 on her fishing trip, and was sold for \$17,000, demonstrating pretty clearly how these vessels make money.

There never was such a demand for dry fish or, in fact, fish in any shape, as at present. Pessimists say.

"It can't last, times will change, etc., etc.," but, why can't it last? Why can't Lunenburg be alive to her opportunities and increase her output as her market widens?

There is no doubt that with the campaign for increased consumption of fish that has been going on during 1917, this article of food is being used in the West particularly, where it was scarcely known before. As for boneless cod, the factory here could dispose of its whole output to one Western American city were it so disposed. This class of fish has become so popular that there is not even a pretence of supplying the extraordinary demand. But, why not supply it? Why aren't there enough factories engaged in this lucrative business to keep all the markets stocked?

Then the fresh fish industry in Lunenburg County. Why aren't there enough enterprising men here to develop this branch of the calling? At the mouth of the La Have river there is a firm, the La Have Outfitting Company, Limited, with vessels, men and the wish to engage in this industry. Markets are crying out for stocks; the solution to the high cost of living problem lies largely in the increased use of fish as food, yet this one spot in the whole of Lunenburg County, where this industry would be prosecuted, is held up by a paltry twelve miles of railroad necessary to connect with the main line at Bridgewater. What is the use of talking about the wonderful things that can be done, the big things that ought to be done, when a vast industry can be held up for the want of a little spur line of railroad?

Never in the history of the fisheries has there been a more urgent need for co-operative action. The grave problems which the war has placed before us, can touch us very nearly when it comes to the fisheries and the important part they play in cheapening the cost of living, should spur the residents of this county to strive to secure that railroad necessary to carry the fresh fish to a depot where they may be shipped to the needed markets. Should urge them to build boneless cod factories to supply the vast markets which the war is opening steadily.

These factories would involve other industries, box-making being one of them. Wooden packages are required of many sizes to put these fish up attractively, and such a factory would employ many hands, but there is no day service in the town electric light plant, so that industry is handicapped also.

But when Boehner Brothers started their business on the La Have river, sash factory, wood working and lastly shipbuilding, they installed their own power, though they were nine miles from the nearest town, and there is not the smallest part of their big plant held up for an instant for want of power.

Efficiency raised to the Nth grade enables them to grasp the least or greatest opportunities, and if we are to participate in the competition which we must surely face after the great tragedy is played to the end, it behoves the citizens of this community to gird on their armor and be ready.

More vessels and more men should at once be got into action, and when anyone comes along with the time-worn argument that it is impossible to get men, just remember that when the schooners were equipped this year there were one hundred and eighty applications for berths, which had to be refused.

The fresh fishing industry should be developed at the earliest possible moment, and the experience of

the three bank fishing captains who ran into Halifax last spring after ten days' fishing and disposed of their catch at a big figure, should be an incentive to others.

It would almost seem, in view of the need of fresh fish as a question of economics, that every effort should be made to not only further the exportation of the dried and salted forms to foreign markets, but to cater to the popular, if somewhat recently developed, taste for fish, and to accommodate the housewife who is looking for a nutritious, palatable substitute to replace the food wanted for our troops, beef and bacon.

In former times fish were considered largely in the abstract. They were a widely recognized article of diet of course, but as in many phases of the food question, it was purely a matter of taste; you could take it or leave it.

To-day, through the circumstances, attendant on the world's greatest tragedy, you help to do your bit through your appetite for fish, and those who have

vast value to Canada, and her value will be no less to those countries to which she will bring the form of food so essential to-day, cheap yet nutritive.

With these absolute facts in view, no lethargy should allow these big opportunities to slip from our grasp, for just as surely as we neglect them, just so surely will other countries turn to the waters for their fortune.

Lunenburg has more or less got into a self-satisfied groove, because there has always been the demand for her product, superior or inferior, but she has never had to face very serious competition hitherto, and it is only reasonable to recognize that after the war there will be competition, and none but the best will get recognition.

Pursuing this line of argument, it is to be hoped that our fishermen will give more attention to white naping their catches, so that they may make as good a showing as the Alaska or French stocks, all of which are white naped.



One of Capt. Colp's crews that enjoys the distinction of being the tallest group of men that have ever sailed out of Lunenburg.

looked askance at it in the past may now speed up their patriotic fervor by cultivating a taste for fish in any guise, from the kingly lobster, sold at so much—and so much, is right—per half portion, to the humblest member of the finny tribe.

Fish have arrived, and if life isn't turned into one glorious long fish day, it has got to the pitch that at least on two days of the week, the eating of it is compulsory. At any time, should the war stretch over a longer period than is anticipated, there may be an edict issued, that four days must be given over to fish, so great a substitute is it for meat, the mainstay of our meat-eating nation.

How much better off we would be physically and mentally, were this to be put in force, can scarcely be measured, as there is absolutely no doubt that Canadians eat too much meat. The home markets then, must be given more attention and the foreign fields where the food problem is more serious and where the fisheries have been blasted by loss of men and ships, there awaits the export trade which will be of

It is hard to believe that in the entire fleet this year there were only two vessels whose captains insisted on white naped fish. These men, Captain Ritcey of the Itaska and Captain Backman of the Marjorie Backman, received 75 cents per quintal more for this class of fish than the other captains, from Zwicker & Company, who are making an uphill fight to have this style of fish the rule, rather than the exception.

The French fishermen make a better job of white naping than do the Lunenburg men, among whom it is an innovation which they are slow to approve. The French use a proper knife, which cuts away every vestige of dark part and makes for a finished product. The best class of trade in Rio Janerio, Santos, and Havana, insist on this article, and when the extra work means 75 cents on a quintal, it should be worth while.

At any rate, the Lunenburg fishermen should take pride enough in their catch, not to want their fish compared with any other, to their detriment.

While the value of salt cod runs into big figures,

there are still other varieties of fish which swell the total value of our products of the sea to over \$3,000,000. The edible varieties which commend themselves to the popular appetite and are a source of revenue to our fishermen include halibut, mackerel, herring, cod, pollock, hake, salmon, cusk, swordfish, with lobsters and scallops leading among the crustaceans. The huge strides that the export business in scallops has made in Lunenburg County is surprising. The American markets insist on having all that can be possibly spared, as they are of extra quality. New beds were uncovered in Mahone Bay during the past year, which gave the scallop raking industry a boost, which has advanced it among the sure money getters of the county. Hitherto this industry was prosecuted in a rather desultory manner and all for local markets. The American demand, however, has put a different face on the matter.

With practically no outlay, as nearly all the residents along the shore have boats, these men get \$40.00 per half barrel for their shelled scallops in Boston and New York, and they have made good money. Boats from Tancook, Mahone and all along the coast add to their owners' incomes, and thus one more source of revenue is added to Lunenburg.

Should the lobster season which has just opened, prove auspicious, the men who depend very largely upon this branch for their livelihood will no doubt have a share in the prosperity which seems to obtain wherever any of the sea foods are marketed.

The season in the early part of 1917 was rough and boisterous, and the men suffered heavy losses. Fine weather, is the prayer of the lobster fisherman, as their traps are made into kindling wood, should blizzards and high winds prevail.

If the men are only lucky enough to be able to attend their traps and secure a haul, the American markets are waiting eagerly to snap up the catch at the highest figure. One hundred dollars for a crate of large fish under 200 lbs. was often obtained last winter by Nova Scotia fishermen, during the months of February and March. When you consider that only about 25 per cent of the weight of a live lobster is actual meat, this means a first cost of nearly \$2.00 per pound. Should you care to do a little mental arithmetic, you might estimate the cost of a "Broiled Live" on Broadway. The poet of the Great White Way who being evidently more familiar with lobster palaces than with the briny deep, perhaps had just been mulcted of a portion of his year's salary for one of these when he sang:

Lo, when his scarp cleaves the way,
The Cardinal of the seas."

The lobster, alas, is not invested with the "Red Hat" while cleaving the seas. It is only when he is a dead one that his rosy moments arrive.

The shore cod, haddock, are all cured and sold dry to local markets, and the large No. 1 mackerel, running 110 to 150 to the barrel brought the fishermen \$24.00 at home for 200 lbs., not including salt or barrels. Herring were very scarce, with a big demand from New York and Philadelphia at \$10.00 per barrel. So it may be seen that individually and collectively, the fishermen have received big returns for their labor.

The crew that can put it all over other fishermen this year is that of the high line fishing schooner Lucile M. Colp, Captain Maynard Colp, who landed the biggest catch ever brought to this port by a trawler or handliner. The Lucile belongs to the latter

class. Captain Colp is proud of his honor, of being high line skipper, proud of his schooner, and his men. This successful captain, who is but thirty-two years of age, is a typical master of a lucky Lunenburg fishing schooner. When but 23 years of age he bought the schooner Minnee M. Cook from Captain Abraham Cook, whose high line honors occupied a page of the Canadian Fisherman in 1915 and 1916. Captain Colp had two lucky years in this craft, and then disposed of her to Captain Nat. Butler, of Newfoundland. In 1908 he had his first vessel built, the Argenia, launched December 26. In January of that year he went to Newfoundland for herring for Captain Sol. Jacobs of Gloucester. In the spring he started fishing, making three trips, landing 4,968,000 lbs. of green fish.

In the fall of this year he made a trip to Bay of Islands for herring, which were disposed of at Boston. For the fishing season of 1910 he landed 2,200 qtls. of fish and in the fall made a freighting trip to the West Indies.

In 1911 he had another successful fishing season. In the fall he went to Bay of Islands for frozen herring, and on arriving at Port au Basque, found the harbor frozen. Leaving his schooner, he went to another port by rail, secured a cargo of herring in a week, but on his way back got caught in a blizzard, and had to spend three days in a box car, the passenger coach being upset. The cargo was disposed of at Halifax and the schooner was sold to Captain Burke, of Newfoundland, for \$6,530.

In 1912 Captain Colp made two trips in the Minnie M. Mosher, and in the fall made a trip to Bay of Islands in the schooner Associate for herring, which were sold at Halifax. In May 1913, another new vessel, the Warren Colp, was launched, and his first trip was for the North Bay, where he sailed 1,350 miles searching for fish; on that trip he landed 1,300 quintals. In the fall he took a cargo of dry fish to Spain, making a record trip from Newfoundland to Gibraltar in 11 days. He brought a return cargo of salt to Lunenburg. Early in the following spring the Lucile was loaded with dry fish for Trinidad, to bring a return cargo of salt from Turk's Island. Captain Sponagle sailed the vessel this trip and made the round trip in six weeks. For the season of 1914 he fished at North Bay, and landed 1,500 quintals, and in the fall loaded produce at Prince Edward Island for Halifax. In 1915, he made his first bank hand lining trip, landing in the spring 900 qtls. of fish and for the summer 1,300 qtls.

In the fall, Captain Colp was the first to start double dory handling on Scatterie Bank. That trip extended from October 3 to November 10, the catch being 519 quintals, 200 being fished from the deck. The high liner of the crew shared \$112 on this trip. The Warren Colp was then sold to Captain Bond of Newfoundland for \$8,400. This schooner cost the owners \$6,400 when new. In 30 months she had cleared for the owners \$14,000.

The Lucile Colp, the high liner for 1917 was launched at Lunenburg in May 1916. Her first trip extended from June 4 to August 9, and her catch was 1,984 qtls., which was the highest handling catch ever made. On August 2 Captain Colp started on another double dory hand lining trip, closing November 2, when he landed 745 quintals. In the fall he made a freighting trip from Prince Edward Island to Boston. The dividend for that year was \$6,850.

In 1917 the spring trip started April 22 and closed

June 15 with the biggest hand-lining catch ever landed. The next trip also was a record beater, extending from June 27 to August 18, and landing 1,987 quintals, which exceeded the best season of the previous year. On September 2, another trip was made, closing October 2, with 1.075 quintals, making the grand total of 4,630 quintals, an unprecedented catch in the history of the port. Each of the crew shared for the last trip \$202, and for the entire season the average share was \$986, the high liner of the crew sharing \$1,200. Her total stock for the season equalled \$44,892.11, beating Captain Alden Geele, the Gloucester record breaker, of the schooner Elsie, by 86 cents.

Captain Geele's fishing season, however, extended a month longer than Captain Colp's and he used 22 dories and Captain Colp but 18.

The Lucile's dividend for 1917 was \$13,250. Her dividends for two seasons were \$20,100.00 and her cost when new was \$8,400.

The following schooners were added to the fleet during 1917 at Smith & Rhuland's yard:—The Alicante, for Captain Milton Romkey; George A. Rhuland, Captain Clarence Myra; Frances Louise, Captain Lorraine Backman; Bernice Zinck, Captain Dan Zinck; Irene Corkum, Captain Leo Corkum; Andre is also a new one to be launched this week for Captain Freeman Corkum, and one, a knockabout, for Captain Emil Mack. Captain Mack, it will be remembered, introduced the first of the semi-knockabouts here, a style that has been almost universally adopted.

New vessels have been contracted for by Captains George Himmelman, William Cook, John Westhaver, Scott Corkum, Abraham Cook, Angus Walters, Albert Himmelman, Alvin Himmelman, Harris Heisler, James Hertle, Roland Knickle, Roy Spindler, Irving Sindler, Willet Spindler, and Thomas Himmelman.

The fishing vessels were built 17 years ago at a cost of \$3,500, but have increased steadily until now they run approximately to \$12,000, which, ready for sea, means \$22,000 or \$23,000. Vessels built last year cannot be bought for \$25,000. This will give some idea of the vast sums of money represented by the tonnage of the Lunenburg fleet, and the general prosperity which is the reward of the toilers of the deep for 1917.

DISTRIBUTION FROM FISH HATCHERIES.

Summary, by species, of the distribution of fish from the Dominion Fish Hatcheries during 1917:—

Specie.	No. Distrubted.
Ouananiche Salmon	10,580
Steelhead Salmon	26,304
Kamloops Trout	655,637
Rainbow Trout	25,440
Cut-throat Trout	986,058
Sockeye Salmon	68,794,300
Spring Salmon	3,249,540
Cohoe Salmon	2,572,210
Dog Salmon	4,988,600
Salmon Trout	32,685,935
Speckled Trout	853,391
Whitefish	497,332,000
Herring	58,039,000
Pickrel	180,000,000
Shad	400,000
Lobsters	614,798,989
	<hr/>
	1,490,671,104

Bulletin 73, Educational Dept., New England Fish Exchange.

TWO MORE WHITE HOPES.

If you happen to be eating Christmas dinner at one of the most luxurious New York hotels this year, you will find yourself eating, not the proverbial turkey or roast goose, but greyfish!

Christmas Day is to be strictly observed by the best New York hotels as a meatless day; and, to show a true American spirit, the most expensive and exclusive of the hostleries has decided to accentuate this fact by using the long-despised and re-named dogfish as the basis for its menu.

It might be mentioned that the price per plate of this menu will be three dollars.

But this use of greyfish betokens more than a mere change of the Christmas menu. It indicates that after years of effort on the part of government experts, the public is beginning to take notice of the two white hopes of the fisheries, greyfish and whiting.

These two varieties, the former long regarded as a destroyer of fishing gear, and the latter as a harmless but useless fish, are the two kinds to which, more than to any other, residents of the Eastern part of the country must look for really cheap sea food.

Pending this delivery of the large fleet of steam trawlers now building, no radical drop can be expected in the prices of the more widely popular varieties.

While it is quite true that there are plenty of fish in the sea, it is also true that there is no equipped fleet prepared to bring to port sufficiently large catches to fill the abnormal demand. Such a fleet is now building, but, pending its delivery, the fishing industry is faced with a terrific demand and a meager supply, so far as the popular varieties are concerned. The wholesale dealers, distributing the catch as fast as it reaches port, cannot keep up with the demand on many varieties; and, as a consequence, the price is forced up slightly.

From this situation the consumer may find relief by use of less well known varieties, and foremost among these are Greyfish and Whiting.

ICELAND FISHERIES.

The results of the herring fishery at Iceland this summer are very poor compared with recent years, owing to a variety of causes, and mainly to the limitations which the circumstances of the war have put upon the disposal of the fish. The total number of barrels of salted herrings prepared up to the end of August was 48,528, as against 314,184 barrels at the same date last year, 256,629 barrels in 1915 and 195,807 in 1914. There was great scarcity of salt and barrels, and foreign herring fishermen were conspicuous by their absence. The codfishery was successful motor boats making up to 350 tons and cutters 65 tons.—Gloucester Times.

None of the fish men in Halifax are reported as being injured in the recent disaster, though some had narrow escapes.

Mr. R. H. Matthews, of Queensport, N.S., was in Montreal recently.

British Columbia Fisheries in 1917

The feature of the Salmon Pack in British Columbia for 1917, is the small run of sockeye salmon on the Fraser River.

The big year fervently prayed for did not materialise. The poverty of sockeye now fairly compensated for by a corresponding high price for other grades of salmon, perforce dropped into the market to take the place of the sockeye.

From all standpoints except that by late transportation the year of 1917 may be said to have been a fair year to all concerned, the greatest material advantage going to the fishermen to whom unprecedented prices were paid for raw salmon, owing to the great demand and spirited competition among the buyers for the canneries, and the buyers for the fresh salmon market.

The year 1917 was scheduled in the cycle of Big Years for the sockeye salmon on the Fraser River. So many thought in the fall and winter of 1916, and in preparing for the 1917 pack, fishermen, canners and buyers were all more or less obsessed with the glamour of another Big Year.

In the regular course of events the big run which has come every fourth year was due. But in 1913, four years ago, the passage of the Sockeye up the Fraser River was for a considerable time blocked at Hell's Gate, a narrow canyon, by slides of rock due to railway construction, and there was uncertainty to what extent the seeding of the spawning beds in the upper reaches had been interfered with. The minority opinion was that notwithstanding this interference with the fish passages sufficient sockeye had reached the spawning beds to ensure a big run in 1917. But the majority opinion was that a half run might be expected, or say a pack of 300,000 cases against a total pack of Fraser River Sockeye in 1913 of 684,596 cases. The actual results for the season of 1917 showed that everyone had been too optimistic for the actual pack on the Fraser was only 123,614 cases.

The short run of sockeye was in itself bad enough, but the position was rendered even worse by the increased intensity of fishing in Puget Sound waters; purse seines in addition to traps being operated there to such an extent that very little opportunity was afforded the fish to get through these artificial obstructions to the Fraser River itself, and thence to the upper reaches.

Extreme prices were paid to fishermen for the raw salmon, not only for sockeyes, but for all other varieties. These prices were to a certain extent warranted by the small catches, but were largely due to excessive competition between the packers and the fresh fish trade. This competition has been growing stronger every year during the past three years and bids fair to increase in intensity rather than to relax. This is a consideration that will now have to be taken into account yearly in estimating the pack of B. C. Canned Salmon. How far reaching it is, is patent to all who know the advance made in cold storage plants and the facilities afforded transportation companies for the long shipment of fresh salmon. The canned salmon trade can adjust itself to this new condition there is no doubt, but it is well to view the situation with understanding, and as a permanent item in all calculations regarding the canned salmon pack.

Packers who made early forward sales, basing their estimates on a 50 per cent run of Sockeye on the Fraser, found themselves in a rather bad position because the price of raw fish advanced to such an extent that the costs of the pack exceeded all estimates. Packers were also in all districts faced with considerable labor difficulties, and the necessity of paying such higher wages than in any previous year. The cost of all raw material going into the production of canned salmon was from 50 per cent to 75 per cent higher in 1917 than in 1916, and this created additional anxiety and expense for the packers.

It may be said in dealing with each variety of salmon in detail:

Sockeye. The Fraser River run was quite a failure and the pack of Sockeye in other British Columbia waters was more or less disappointing. The Fraser produced 123,614 cases, less than a 25 per cent big year pack. The Skeena River yielded 65,760 cases; Rivers Inlet, thoroughly disappointing, 61,196 cases; Naas River 22,128, rather an improvement; Outlying districts 32,902, making a total Sockeye pack of 305,557 cases.

Red Springs. The run of these was disappointing, and high prices paid for this variety of salmon by the fresh fish trade made canning profitable. On the Fraser the pack was 10,197 cases; on the Skeena 13,586 cases; on Rivers Inlet 715 cases; on the Naas River 3,170 cases; and elsewhere 5,248 cases. These fish appeal particularly to the fresh fish trade and were purchased by the cold storage companies for immediate shipment fresh.

Cohoos. There was a strong demand for these from the fresh fish trade, but the run in almost all localities was disappointing, the total pack for the Province being a light one. The prices were so high for the fresh fish trade that most packers found it unprofitable to pack. On the Fraser the pack was 25,895 cases; on the Skeena 38,456 cases; on the Naas River 22,180 cases; on Rivers Inlet 8,124 cases; elsewhere 30,201 cases.

Pinks. The run of pinks in Northern British Columbia waters was satisfactory, and the quality in some localities especially good. On the Fraser River the pack was disappointing, because although there was an excellent run of this variety of salmon towards the Fraser River they were mostly intercepted by American fishermen on Puget Sound. The unfortunate position of Fraser River packers was accentuated by the fact that Puget Sound Packers sent their collecting boats up to the Fraser River, and bidding excessively high prices for the raw salmon obtained a large portion of the small catches that were made by the Canadian fishermen. The pack on the Fraser River was 134,442 cases; on the Skeena 148,319 cases; on Rivers Inlet 8,065 cases; on the Naas River 44,568 cases; elsewhere 112,109 cases.

Chums. The run of this variety was patchy. In many localities in Northern British Columbia the pack was quite disappointing, but there was an exceptionally good run on the West Coast of Vancouver Island, and it was possible to take full advantage of it owing to the fact that two new packing plants had been installed and operated there for the first time this year. The pack on the Fraser was 59,973 cases; on the Skeena

21,516 cases; on Rivers Inlet 16,101 cases; on the Naas 24,938 cases; elsewhere 112,364 cases.

White Springs. These fish are slowly coming into the range of the packers. Hitherto they have had only moderate popularity either from the packers or the fresh fish trade. The pack was small, it will be larger as the years go on. On the Fraser it was 18,916 cases; on the Skeena 2,699 cases; on Rivers Inlet 102 cases; on the Naas 1,326 cases, elsewhere 808 cases.

Market. It has been the practice for English buyers to make contracts for considerable quantities of the British Columbia pack in advance of actual packing, usually commencing purchases in the early months of the year for the pack to be put up in July, August and September.

All buyers were in a very difficult position when considering purchase of the 1917 pack. There was the great uncertainty regarding the Fraser River Sockeye run which would necessarily be a great and even determining factor in final prices not only for sockeye, but for all varieties of salmon, and there was in addition the great uncertainty regarding transportation facilities to Europe.

Packers were not willing to sell unless buyers definitely undertook to take delivery of salmon when ready, irrespective of freighting or other conditions, and it was therefore highly speculative to buy forward.

Notwithstanding this, however, trading in the 1917 pack commenced at the end of September, 1916, and a large portion of the 1917 pack in all varieties had been contracted for before packing actually commenced. Had there been even a 50 per cent run of Sockeye on the Fraser River early buyers would have probably found themselves in an unenviable position, but as things turned out these early contracts proved to be exceptionally favorable to buyers, costs advancing to such an extent that packers had to advance their sale prices for such of their pack as remained unsold. The demand continued very active notwithstanding the higher prices, and practically the whole of the British Columbia pack has been sold with the exception of a few Chum tails and Chum half flats.

Buyers realizing the danger of transportation difficulties made every effort to ship their purchases as soon as ready, with the fortunate result that a large portion of the pack was shipped out before the freight situation tightened up at the beginning of November. As a whole the British Columbia pack may be considered as disposed of and shipped out most satisfactorily under conditions which have prevailed.

Herrings. Increased attention is being given to the canning of herring. The Wallace Fisheries during the last three years have successfully developed a considerable business in canned herring, fresh, kippered and in tomato sauce, establishing the reputation of British Columbia Canned Herring in the world markets. If care is taken by packers generally to maintain the high standard set the future of this trade is bright.

MANITOBA FISH COMMITTEE.

The Manitoba Fish Committee of the Food Controller's Fish Committee have been appointed. Mr. W. Douglas, of the Guest Fish Co., Winnipeg, is Chairman, with Mr. Christian Paulson, Selkirk, and Mr. Johannes Sigurdson, Winnipeg, as the other members.

SCARCITY OF BAIT.

The need in Yarmouth of a cold storage or freezer was urgently felt on Saturday, when the several fishing vessels arrived in port with big fares of fish and their supply of bait practically gone. The situation is a very serious one and just how it will be immediately met to any great extent is a problem.

The Lockport freezer is practically exhausted and we are informed what little is left will be supplied only to the vessels operating out of that port. We also learn that what they have on hand at that place is squid, refrozen, which at its very best is a poor quality compared to frozen or salt herring.

Some two or three months ago tremendous schools of herring were upon these shores. At that time large quantities were taken at Lockport and the freezer filled to capacity. Still the herring continued to school and they were used for fertilizer. About the same time there were great schools off Yarmouth. Boat load upon boat load was brought into port and local shippers bought the fish, pickled the fares and then shipped to Boston, Gloucester and New York.

Had Yarmouth at that time had a cold storage of some sort whereby these fish could have been taken care of, the fishermen to-day would not be facing the serious situation that is now confronting them.

There is a quantity of salt bait at Grand Manan, but for one of the vessels to go to that place at this season of the year may mean many days on account of the changeable weather conditions. The matter is creating considerable consternation among the fishermen, for when the weather is at all favorable fish in great abundance are on the grounds.

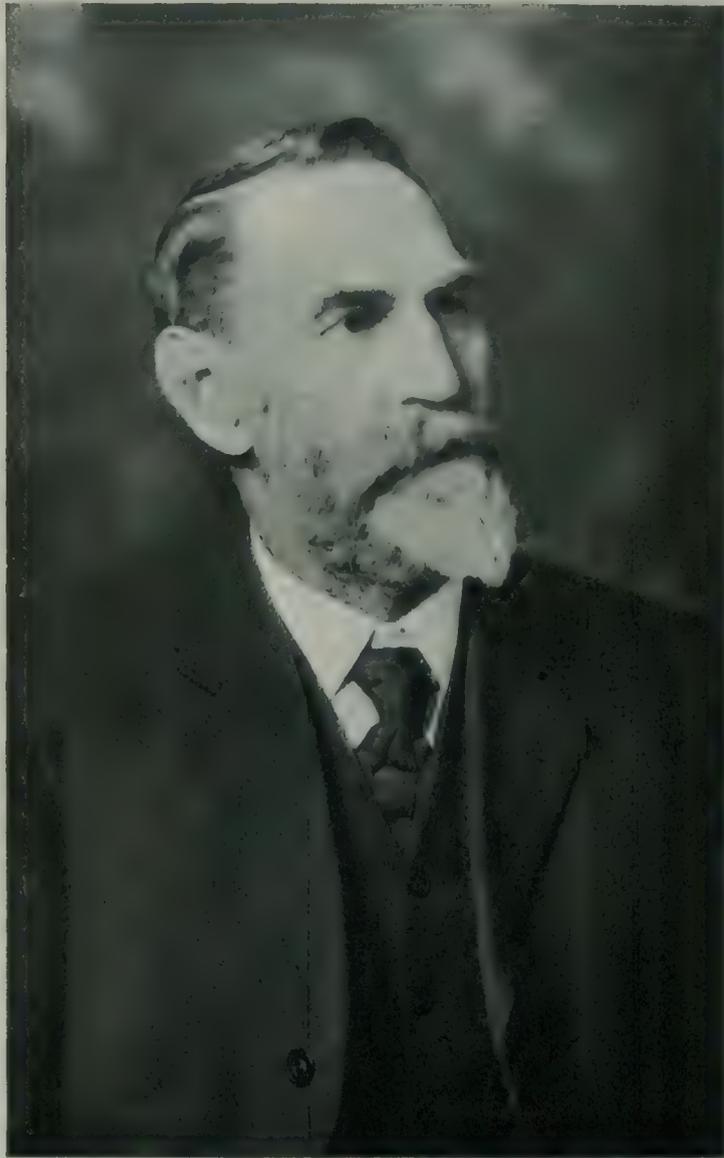
DOG-FISH LEATHER.

As all fishermen are aware, dog-fish was considered a pest and not valuable as a species of fish, but there has been a gradual development in its uses for several purposes, until now it is being rated as a most valuable fish.

The tanners of Peabody, Mass., have been making some interesting experiments lately with shark dog-fish, and even dog-fish skins. It does not seem probable that this hide, if such it may be called, can ever replace leather for shoes, but according to the tanners, there is no reason to doubt that it will largely supersede leather, sheep skin and kid for book-bindings and a thousand and one novelties. The shark skins are in line with those recently made in that city by a local tanner, who produced a splendid article from a big dog-fish skin, which was used in the manufacture of pocket-books. It would seem that a new economic field has been opened up which should be developed, particularly as leather has attained an almost prohibitive price so far as the manufacture of novelties is concerned.

Great quantities of herring have been caught on the Lakes during November and December. The catch is one of the greatest in years.

It is stated that oleomargarine can be made from fish oil.



W. F. LEONARD, St. John, New Brunswick
Director of Canadian Fisheries Association



Hon. J. McLEAN Souris, Prince Edward Island
Director of Canadian Fisheries Association

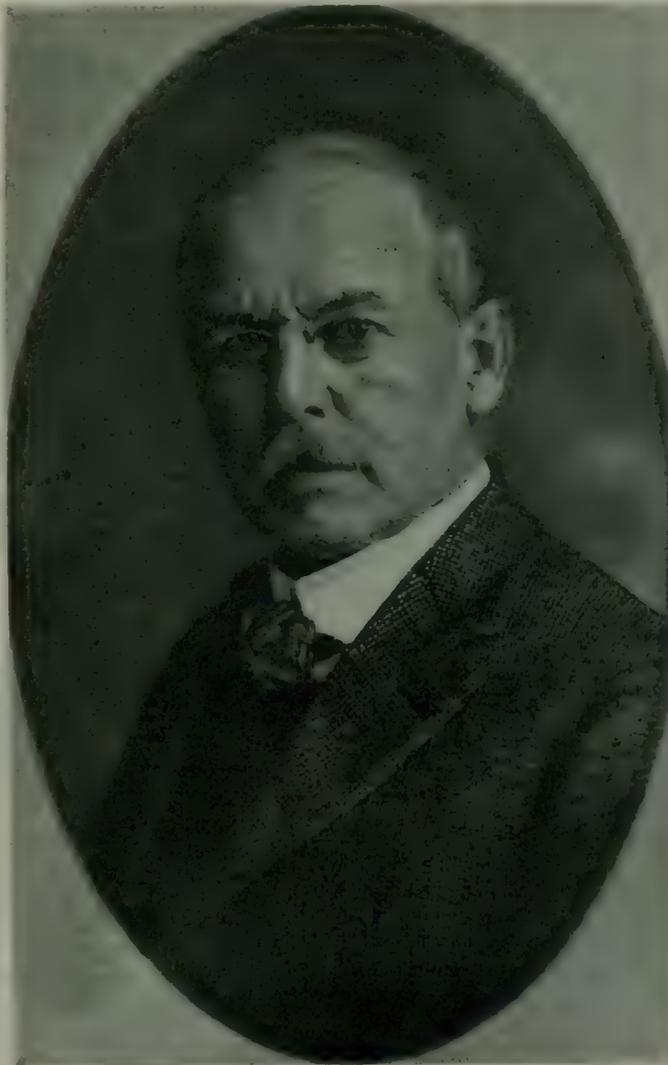
In the Destruction of the Fraser River Big Run of Sockeye Salmon, Canada Suffers a Heavy Loss in an Important Natural Resource

John P. Babcock, Assistant Commissioner of Fisheries of British Columbia, read a paper at the annual meeting of the Conservation Commission, Ottawa, on "The Salmon Fishery of the Fraser River District," in which he demonstrated that the sockeye salmon caught in that district were all hatched in the Fraser River in British Columbia, spent the first year of their life there, then migrated to sea where they remain until the summer of their fourth year, when they return to the Fraser River to spawn and die. In coming back from the sea they pass through both American and Canadian channels in order to again enter the river. In passing through the American channels, 66 per cent of the total catch is made by American fishermen, and on reaching Canadian waters, 34 per cent of the total catch is made by Canadian fishermen. The fishery is therefore an international one.

Br. Babcock said: "A study of the recorded catch of the sockeye salmon in the district for the eight years—1909 to 1916—inclusive, affords a comprehensive basis for an understanding of the conditions in both American and Canadian waters up to 1917. It displays the vast difference in the catch every fourth year,—known as the big year—and in the three succeeding years termed the lean years. Up to 1917, as well as the great difference in the proportion of the catch in Provincial and State waters, catch in the lean years." The catch for the years 1909-1916 includes the catch for the last two big years and the last six lean years. The grand total for the eight years is 5,775,397 cases, of which 33.9 per cent

were taken in Canadian waters and 66.1 per cent in United States waters. The catch in state waters in the two big years—1909 and 1913—exceeded the Canadian catch more than 100 per cent. The catch in state waters in the last six lean years exceeded the catch in Canadian waters by 157 per cent. The decline in the catch in the lean years is pronounced.

Since all the sockeye caught in the district are native to the Fraser, are four years old when caught and die after spawning, it is manifest that the run in the big and the lean years is the product of the same spawning beds, the run each year consisting of those hatched in the fourth preceding years. Records show that in the big years the beds of the Fraser River have been abundantly seeded and that those same beds have not been at all well seeded in the lean years. The catches in the big years display the maximum product of the spawning area of the river—the vast harvest that can be reaped four years after the beds have been adequately seeded. The poor runs of the lean years are the natural results of a failure to seed those same beds. Since the beds were abundantly seeded in the big years, 1909 and 1913, it is manifest that the catches in those years, great as they were, were not made at the expense of the breeding stock. The catch in those years represents that proportion of the total run of that year



JOHN P. BABCOCK,
Ass't Commissioner of Fisheries of British Columbia.

and the decline of the The catch for the years 1909-1916 includes the catch for the last two big years and the last six lean years. The grand total for the eight years is 5,775,397 cases, of which 33.9 per cent

that was in excess of the number necessary to stock all the bed abundantly enough to produce other great runs.

The catches in the lean years have grown smaller because they were made at the expense of the brood

stock. That enough fish in those years did not reach the beds. The fish that are caught and canned are not factors in the future runs. The fish that escape are the stock in trade. For the past fourteen years, the reports from the spawning bed have called attention to these conditions, conditions that forecasted depletion of the runs in the lean years. The history of fishing in the Fraser River District for the past decade and more is a record of depletion, a record of failure on the part of American authorities to realize the necessity of conserving a great fishery, notwithstanding the convincing evidence submitted by agents of their own creation.

"On the other hand," Mr. Babcock said, "the Canadian authorities have by their acts evinced in unmistakable manner their willingness to deal adequately with conditions and to join with the State of Washington or the United States in legislation to prevent further depletion.

Considering that the proportion of the catch made by American fishermen in the last three big years averaged 1,399,800 cases per year of an average yearly value of \$11,198,464, while their catch in each of the last six lean years has been but 182,091 cases per year of an average value of \$1,456,728, it is difficult to appreciate the failure of the American authorities to take action.

The failure of the U.S. authorities to join Canada in the adoption of measure to insure the seeding of the spawn beds of the Fraser in the lean years, as abundantly as they were seeded in the big years has entailed a loss of American fishery interest in excess of \$29,000,000. Turning from a consideration of conditions in the years previous to 1917, Mr. Babcock dealt with the results of that year's fishing. He demonstrated that the beds of the Fraser were not well seeded in the previous big year 1913, owing to the fact that the millions of fish which escaped capture in that year did not reach the spawning beds because of a great

slide of rock which prevented the ascent of the fish. That millions of sock-eye salmon that year died below the blockade without having spawned. The catch of 1917, which should have been that of a big year was 1,955,000 cases, or 86 per cent less than that of the previous big year. And not only was the catch 86 per cent less than in 1912, the spawning beds were not any better seeded in 1917 than in recent lean years.

"The result of that spawning," he said, "cannot produce greater results in 1921 than were produced by the spawning of 1913. The failure of the salmon to run as abundantly in 1917 as in former big years, entailed a loss that year to the fishermen and canners of British Columbia of over \$8,000,000, and the loss to the fishermen and canners of the State of Washington exceeded \$19,500,000, and the loss will not be confined to 1917. It will be repeated every fourth year, until such time as the governments of Canada and the United States by united, drastic and long continued efforts shall succeed in placing on the spawning beds of the Fraser River the equal of the millions of individual adult salmon that spawned there every fourth year up to 1913.

"Such statements should bring a realization of the extent of the measure that must be adopted if the runs to the Fraser River are to be restored. There have been, and there will continue to be many suggestions as to how this can be accomplished, but all of them that fall short of closing the sock-eye fishery in the district for a long period of years—years including many four-year cycles, will fail to produce the equal of the runs of former big years. The remedy cannot be applied by one government alone. Neither Canada or the United States alone can accomplish it. There must be joint action. The need of joint action is great. The longer it is postponed the longer it will take. No other fishery question on this continent is of such importance. In no other fishery can so much be accomplished."

How to Cure Herring, Cod and Salmon

We are indebted to Mr. John P. Babcock, Assistant to the Commissioner of Fisheries for British Columbia, who has supplied the following extracts on "How to Cure Herring, Cod and Salmon" from the manual on "The Art of Fish-Curing," by R. J. Duthie, published by the Rosemont Press, Aberdeen, Scotland.

Pickling Herring.

Barrels or Kits.—At the smaller fishing-ports the price of fresh herring is usually too high to permit the smaller dealer to cure profitably, but chances of cheap fish are sure to come to him who waits. It is wise, therefore, to keep a few good barrels in stock—whole barrels, half-barrels, or kits, according to trade requirements—as well as sufficient salt for the purpose, so as to be ready to take advantage of the chance when it comes. If the operator is a novice to the trade and has no skilled workers available, he had better be content with one, or at most two, barrels at first; or, even better, he might commence curing small balances left over from the counter trade, provided the fish have not been kept until they have become soft or stale. In the latter case, however, he should select a barrel or kit which the herrings on hand are likely

to fill; remnants packed into the same barrel on successive days do not make a good cure.

If the barrels have not already been prepared, the curer should now "unhead" as many as he is likely to require, and either fill or thoroughly rinse them with water. If the barrels have previously been stored in a dry place, a good soaking is absolutely necessary. An old barrel or other good-sized vessel should be provided to hold the offal, which, by the way, should always be got rid of as quickly as possible after each day's work is finished. If the herrings are to be selected—and this should be done if they show much difference in size and condition—a basket, tub, or other vessel will have to be provided for each selection.

The knife universally used for the gutting of herrings is a sharp-pointed, short-bladed knife with a fixed handle, which should be obtainable at any ironmonger's shop. The extreme length of the blade is about 2½ inches, and the handle is about 4 inches.

Scotch girls who are employed in the curing of herrings wrap cotton or linen rags round the thumb of the right hand and at least the forefinger of the left

hand; and this is a good plan for any novice to follow to lessen the risk of accidents.

In gutting, take hold of the herring about the middle with the left hand, the thumb being over one side and the rest of the fingers over the other, and the throat of the fish exposed. Insert the knife through the gills, with the edge towards the operator; give the knife a sharp turn upwards, and draw the right hand outwards over the herring's head. If the operation has been entirely successful, the gills and stomach, etc., will have been completely removed; if it has not, a second movement will be necessary. Gentle pressure with the left hand assists the operation. In drawing out the intestines, however, care should be taken to draw the right hand outwards rather than upwards, as the latter movement is apt to tear the fish if they are tender. If the gutting is neatly and properly done, very little of the fish will have been removed—only the pectoral fins and upwards to the gills.

"Rousing" and Packing.—The most important process in the curing of herrings is known as "rousing." This is best done by hand in a large tub. A few platefuls of salt are first thrown over the gutted herrings, after which the packer turns them up thoroughly from the bottom of the tub, until every herring has come freely into contact with the salt. They are now ready for packing. A tight barrel or kit, damp inside, is placed beside the rousing-tub and the packer lifts a couple of handfuls of the roused herrings, shaking the salt freely from them, and drops them gently into the barrel. Salt should not be spread in the bottom of the barrel before the herrings are put in. The packer commences by placing one herring on its back, against the side of the barrel; two others are placed against it, their heads to the sides of the barrel, and their tails meeting or overlapping; a middle herring is placed in front of the tails of the last two, followed by two more with their heads to the sides of the barrel, and so on until the tier is complete. The herrings should be set well up on their backs, and the tier should be tight. Salting is an important matter. The exact amount of salt to be used on each tier should depend on the size and strength of the fish, the strength of the salt, the market the herrings are destined for, and the length of time they are likely to be kept in stock. Large-sized herrings require more salt to each tier than small, and full herrings more than spent, but in no case should the herrings be buried in salt. As a general rule, one barrel of salt will be required to cure three barrels of herrings.

Upon the heads of herrings of the first tier two herrings (known as "head herrings") are laid at each side, and above these the second tier is laid, the herrings crossing the first tier at right angles. Salt is again sprinkled over the tier, head herrings laid, and third tier crossed over the second, and so on until the barrel is full. Usually the herrings are packed above the level of the barrel, as they sink rapidly in the salt. On the following or second morning the herrings should be filled up level, the ends put in and "tightened," and the barrels laid on their sides. Before the filling-up it is usually advisable to lift off the top tier of the original, and wash the herrings in pickle, to remove any discoloration resulting from exposure to the air. After the barrels have been laid on their sides for eight or ten days they should be bored in the bilge, set on end, the heads taken out, and the pickle run off through the bung-hole. A barrel of herrings

will be required to fill up five or six barrels, and the filling up should be done, when possible, with the same fish as those being filled up. Before starting to fill the barrels, the herrings in each barrel should be pressed down with the hands, and this will be most easily done while the pickle is being run off. The herrings to be used for upfilling should be well washed in clean pickle in a large-sized tub. A ring of herrings laid around the sides of the barrel, with their backs to the wood, will ensure firmness in the packing. The filling-up should be done in the same way as the original packing, except that each herring should be handled separately, and pressed into the proper shape for its position in the tier. Great care should be taken with the top tier, which, to make a full barrel, should show above the chime of the barrel in packing. Each herring should be pressed between the thumbs and fingers of the packer, so that the belly of the fish will be flattened out, and the herrings should be set straight on their backs. When the tier is complete the heads of the herrings should be pressed down and three head herrings laid at each side. These also should be set straight on their backs. Very little salt should be laid between the tiers in the upfilling, and none at all on the top tier. A little clear pickle thrown over the top tier improves the appearance of the fish. Pressure is required to get the head in, the cooper usually having to get up on the barrel and bring his own weight to bear on the end. When the barrel is "tightened" it should be laid on its side and pickled at the bung, after which, if care is taken that the barrel does not leak, the cure is complete.

Pickling.—Immediately after a barrel of herrings is packed, a quantity of clean made pickle should be poured into it—about a bucketful to a whole barrel, and half that quantity to a half-barrel. The usual rough-and-ready method of making pickle is to dissolve salt in clean water until the liquid is strong enough to float a fresh herring or a potato, preferably the latter. A special form of hydrometer registering up to 40 per cent is also used. Put into the natural pickle which herrings produce in the process of curing, this hydrometer usually shows a buoyancy of about 20 per cent. For herring-curing, pickle made from Spanish salt is generally used; and, as the curing of the fish depends mostly upon the pickle, it should show a buoyancy of 25 per cent.

How to Make Bloaters.

Salting.—If fresh herrings have to be dealt with, the usual method of curing is to rouse them well with dry salt upon a brick or pavement floor, turning them over with a wooden shovel during the process of salting, and leaving them overnight in the salt. In the morning they are washed through light pickle and hung on spits or tenters.

Hanging.—Spits, it may be as well to say, are rounded wooden rods, 4 feet long, about the thickness of a man's finger, and sharpened at one end. As the wood is apt to get blunted, tin cones with sharp points are often fixed upon the points of the spits during the process of spitting. Occasionally iron rods are used for spits, and these are much thinner than the wooden ones. To spit herrings, either for bloaters or reds, enter the sharp end of the spit below the gill-cover of the fish and push it out through the mouth. Hang the spits in the kiln—an ordinary kipper-kiln—in the

Pickling.—Curers who make preparation for doing same way as the tenters or kippers.

a large business in bloaters usually have vats or tanks, large enough to contain great quantities of fish, constructed on their premises — sometimes below the floors of their stores. When herrings are plentiful and cheap, these vats are filled with roused herrings (usually sea-salted), which are then floated in pickle, and afterwards drawn out and smoked at the curer's convenience. A regular supply is thus assured for a considerable time, even although prices of fresh herrings should rise or the fishing come to an end.

Smoking.—Bloaters are smoked in much the same way as kippers, but a fire of hardwood billets is usually preferred to chips and sawdust. The soft fuel gives rather more color than is desirable, as bloaters should be dried rather than colored in smoke. Eight hours' light smoking will generally make the fish ready for market.

Packing.—Bloaters are packed across the box with heads all to one side till the tier is complete; then two or four herrings with their heads to opposite ends of the box are laid lengthwise across the tails of the fish in the tier. The second tier is packed across the box like the first, but with the heads of the fish to the opposite side of the box—that is, over the tails of the fish in the lower tier. Herrings are laid over the tails of the fish again, and so on until the box is full.

A Small Kiln.—The fishmonger who may be left with a balance of fresh herrings unsold—or any one who wishes to prepare a few dozen bloaters—may, instead of dry-salting, immerse the herrings in strong clean pickle, and leave them in it overnight. In the morning the fish will be ready for hanging. It should be distinctly understood that the smoking of fish does not depend upon the size of the kiln. All round the Scotch coast, for instance, there may be seen small smoke-houses, in which the fishermen's wives smoke haddocks to perfection. They are generally rough wooden buildings, often put together by the fishermen themselves, perhaps 4 feet square and 6 or 7 feet high, with bars at opposite sides and suitable intervals for supporting the spits or tenters. Dwarf walls of stones or clay inside may protect the wooden walls from the fire. Even a large cask, with both ends out and a few holes in each quarter for ventilation, may be converted into a kiln fit to smoke a few dozen bloaters. In this case it is necessary to put the fire in an iron vessel, and to spread a sack or other heavy covering over the cask during the process of smoking.

How to Make Red Herrings.

Curing.—Rouse the herrings well and pack them into barrels, with plenty of salt about them, the fish being packed much flatter than herrings cured for exportation to the Continent. Herrings intended for "reds" are not gutted, although gutted herrings are occasionally smoked as an after-thought. After standing on end for two or three days the barrels should be filled up, tighter, and laid down. They should be allowed to lie on their sides for at least ten days—some curers prefer to leave them six weeks or more—care being taken to keep the herrings well pickled.

The curing might also be done in the close tanks referred to in the notes on bloater-curing. In this case the herrings should be well roused on the floor, and turned over, during the process of rousing, with a wooden shovel; then, when being put into the tanks, salt should be thrown over them freely, and strong pickle afterwards poured in till the herrings are

afloat. Curing in barrels is, however, the more satisfactory method.

Steeping.—When the herrings are sufficiently cured they should be taken out and spitted in the same way as bloaters, the sharp end of the spit being entered under the gill-covers and pushed out through the mouths of the fish. After this the herrings have to be steeped in water to extract some of the salt. The "steeps" used are generally long, shallow vats, about 4 feet wide. Across these the full spits are spread, the "steeps" are filled with water, and the herrings left to soak for a night. In the morning the water should be drained off and the vats refilled with fresh water.

Drying.—After the herrings have been soaking for about thirty-six hours they should be removed from the water. If the weather be favorable the spits should be spread upon racks in the open air to allow the herrings to dry in the wind, after which they should be hung up in the kiln to be smoked. Should the weather be wet or otherwise unfavorable for outside drying, the fish would have to be hung up in the kiln at once after removal from the steeps, but in that case they would have to be allowed to "drip" for some time before the fires were applied.

Smoking.—The smoking is usually done nowadays in modern kipper-kilns. The herrings should first get the smoke from a small billet-wood fire for one night, and then be allowed to cool all the next day and night. The following day and night another billet-wood fire should be applied, and the fish then allowed to cool again for twenty-four hours. Afterwards fires of chips and sawdust should be burned, the fish being smoked and cooled alternately till the required color and firmness have been obtained. It might take from three to six weeks, according to the requirements of the market for which they were destined, before the fish were satisfactorily smoked.

Packing.—When red herrings are put into small boxes they are packed in the same way as bloaters, the tiers being laid across the box, with four herrings lengthwise over the tails of each tier. To pack into barrels commence with the heads to the side of the barrel, and pack the herrings on their sides till the opposite side of the barrel is reached, when about a third of the bottom of the barrel should be covered. Commence again with the heads to the side of the barrel, but so that the tails of the herrings previously packed will be completely covered, and pack as before till the opposite side of the barrel is once more reached. Begin again with the heads to the side of the barrel, and work across till the tier is finished. Repeat this process tier after tier till the barrel is full. The red-herring barrel is a wooden-hooped, dry-ware cask, like the barrels in which all the smoked haddocks used at one time to be conveyed to market, and there should be from twenty to twenty-five fair-sized herrings in each tier. The packing should be flat; that is, the herrings should be laid on their sides, both in barrels and in boxes. It is scarcely necessary to say that the fish ought to be allowed to cool thoroughly before being packed, otherwise they will deteriorate.

How to Pickle Cod.

Plant, etc.—The requisites for this trade are an ordinary fish-house, with bench and vats, a supply of good fishery salt (second Liverpool generally preferred), and a stock of cod-barrels, which are a little

smaller than ordinary herring-barrels. Offal-barrels, carrying-baskets, scrubbing-brushes, and a set of good knives are, of course, indispensable.

Water.—The water-supply is a most important consideration, as upon its purity the condition and appearance of the fish when finally cured will largely depend. Spring water containing a moderate solution of lime will usually give very satisfactory results, but brown, mossy water is apt to leave a stain on the fish that will detract from their value when offered for sale. So well are some curers aware of this that they will cart water in barrels considerable distances from suitable wells rather than use the public water-supply if the latter does not answer their requirements.

Gutting, etc.—The cod should be headed and gutted and then put into clean water. They may be washed and taken out of this water, either immediately or after about an hour's immersion; but they should not be left too long in it.

Splitting.—The splitting cannot be too carefully and neatly done. So much depends upon the appearance of pickled cod when offered for sale that even greater care is required in handling them than is necessary with fish that are to be dried. Different curers' methods of splitting often vary in certain details; but the following is the method followed by some successful North County curers: The gutted fish should be laid on the bench with its tail towards the splitter, who should take hold of the upper lug of the fish with his left hand, and with his right hand enter the knife at the vent and draw it down above the zone to the root of the tail. He should then give the fish a half-turn—its tail outwards and its shoulders inwards till its back is turned towards him—and, raising the lug with his left hand, split the fish carefully from the bone from the shoulder downwards, leaving as little fish on the bone as possible, and at the same time trying to bring the fish away perfectly clean and smooth. He should next give the now split fish another half-turn, so that its shoulders will be towards and its tail away from him. Then, steadying the fish with his left hand, he should carefully run the knife down under the bone so as to separate it from the fish, and then cut the bone off about twenty or twenty-two joints from the tail. In doing this he should cut through two joints at once, so as to leave the appearance of the figure 8 on the end of the remaining bone. The outer ends of the rib-bones, if still adhering to the fish, should be carefully cut, not torn away.

To make sure that the remaining bone will be properly bled, it should be pierced with the knife near the tail; or, if preferred, it may be split down for 2 or 3 inches from the point of separation.

Cleaning.—The black lining of the stomach should next be removed, and any rags of fish or skin which may be visible should be carefully cut away. The fish should then be washed thoroughly, a hand-brush being used both inside and out. The bone should receive special attention, to make sure that the blood is thoroughly removed.

Pressing.—After washing, some curers press the fish for a couple of hours. This may be done very easily by laying the fish on a bench with boards and weights above them, the object being to drain off the water and any remaining blood from the fish. Other curers, again, object to pressure being applied, on the ground that it makes the fish look thin.

Salting.—The fish should then be salted into vats. Good second fishery Liverpool salt is usually considered best for this purpose; but if a soft cure is desired, Spanish salt is sometimes preferred. In either case the fish should be completely covered with salt, and the salting should be regular, otherwise the fish are apt to have a spotted appearance when cured. The actual quantity of salt necessary will, however, depend to some extent upon the length of time that the fish are likely to be kept before being sent to market, and this can be learned thoroughly by practical experience. Cod which are to be kept for some time should be salted more heavily than fish that are to be disposed of at once. Three-quarters of a hundredweight of salt may be considered sufficient to cure a barrel of cod.

In salting, the fish should be laid in pairs, face to face, just as kippers are packed. If laid otherwise, there is always a risk that the inside of one fish may be discolored through contact with the pigment or natural coloring-matter of the skin of the fish next to it. Extra salt should be added to the top tier; and, as the fish make their own pickle, weights should be put on them to keep them down.

Drawing, Washing, and Paring.—After lying in the curing-vat for not less than forty-eight hours the fish should be drawn out of the pickle. During this process they should be well washed, either in their own or in fresh-made pickle. As each fish is washed it should be laid on the bench in such a position that the pickle will drain from it. After they are washed the fish should be taken one by one and carefully pared. The anal fins should be neatly cut away, and any rags of fish or skin that may have been left about the sides or shoulders should be pared off, so as to leave the fish perfectly clean and well trimmed.

Packing into Barrels.—If they are obtainable, birch or other hardwood barrels are preferable to fir. The latter may impart a flavor of the wood to the fish; the former will not. The packer should lift and handle the fish carefully, so as not to damage them. The best way is to grasp the tail of the fish with the right hand and the shoulder with the left, the skin of the fish being downwards. The fish will thus fall into a partial fold and allow of its being put inside the barrel easily. The bone of the fish should be laid next the side of the barrel. Two medium-sized fish will make a tier, laid head and tail alternately, but overlapping when necessary. A large fish might occupy the whole circumference of the cask. With the exception of the upper tier, which should be laid back up, the fish may now be all packed with the skin downwards, as with the two washings the slime and pigment should be thoroughly removed from the skin.

Salting.—If the fish are destined for immediate consumption, no salt will be required between the tiers, provided they are already well cured. This can, of course, only be known by the touch of an experienced curer, who will be able to tell by the firmness of the fish. As a general rule, however, a light sprinkling of salt is advisable. The barrels should be filled quite full and the ends pressed in and "tighted," the barrels tiered on their sides and bored on the bilge.

Pickling.—Pickle to put into the barrels should be made a few days beforehand. Pickle is made by dissolving salt in clean water until a potato will float, or until a salimeter immersed in it will register about 25 degrees. As for the washing of the fish, so for the making of the pickle, the clearer and purer the

water the better will the cure be. But before being used the pickle should be strained once or oftener through flannel to make it perfectly clean and free from sediment, after which the barrels should be filled with it to the bung and kept so.

Repacking.—Should they have to lie on hand for a few weeks, a careful curer will, before sending his fish to market, open the barrels, take out the fish, and, if necessary, wash and trim them again. After repacking, new pickle should be put into the barrels.

The Small Dealer.—Although the foregoing notes are intended as a description of the working of a fair-sized business, a small dealer who might be left with some fresh cod unsold should easily manage to cure them in pickle at very little cost by following the above instructions. A couple of good-sized tubs, a clean, tight barrel, and 1 cwt. of fishery salt would be sufficient stock to start with.

When salting the fish in the tubs it would not be advisable to put one day's fish down upon the top of the previous day's cure. Each day's fish should be salted in a tub or tank by themselves. If the dealer has an outlet for them, his fish should be ready for market after forty-eight hours' cure—or even twenty-four hours if they were going into immediate consumption. If not, they might, after being drawn, washed, and pared, be packed into the same barrel, one day's fish on the top of the other, as they became "due" or ready. A little salt would have to be sprinkled between the tiers, clean pickle sufficient to cover the fish would have to be poured into the barrel, and weights would have to be laid on the top tier to keep all the fish immersed until the barrel was full and the end put into it.

How to Kipper Salmon.—Scotch Method.

The Scotch method of kippering salmon is simple enough: Wash and head and split it down the back, removing the roe and intestines; then wash again to free it from the blood-stains, etc. Mix equal quantities of strong fishery salt and brown sugar; lay the fish in plenty of this mixture, and allow it to lie in it for forty-eight hours. The fish might be well rubbed with the preservative before being salted down in it. After forty-eight hours, hang the fish up, either in the open air and sun or in an ordinary kipper or finnan kiln. Three small double-pointed sticks should be fixed through the skin at intervals along the back of the fish, to keep it spread out during the process of drying. If dried in a kiln, a few hours' smoking is recommended. Some curers add a little saltpetre to the salt and sugar.

With a fish so rich and fatty as the salmon, it is plain that the above process can only be regarded as a temporary cure; and the fish so cured will only keep for about the same time as kippered herrings or finnan haddocks.

Norwegian Methods.

Mild Cure.—Cut the head off and split the fish down the back. Wash it clean and then put it in salt or ordinary pickle. After lying in the pickle for three days the fish is taken out and washed in clean, fresh water and then stretched upon pieces of lath. These pieces of lath are about an inch and a half broad, but quite thin. They are cut to a length corresponding to the breadth of the fish and sharpened at the ends. One of these spits is put across the back of the fish at the "lugs" or shoulders, another about half-way

down, and, if the fish is very large, another still farther down, the points of the spits being stuck through the skin of the fish. The fish is then "tentered" and hung up in a chimney, where it is smoked over a fire of fir branches for a day and a half or two days. Salmon cured by this process come out something similar in appearance to an Aberdeen-cured haddock, but rather darker in the color.

Hard Cure.—Salmon meant to be kept for two or three months are much harder cured. In this case the fish are split into halves to facilitate the operation of curing, and to make them easier to handle and to stow in the barrels. These should be clean and tight, and preferably of hardwood. Although not insisted on, it would be advisable first to rub the fish well with a mixture of brown sugar and fishery salt, as in the Scotch method, and a little of the same mixture might be thrown in between the pieces of fish as they are packed into the cask. Hard packing should be avoided, sufficient room should be left to let the pickle circulate freely. The barrel should be filled quite full of strong, clean pickle (which in this case had better be filtered), the end put in and "tighted," and the barrel laid on its bilge. If properly cured, salmon treated in this way should keep for two or three months, or even longer if required. The barrel should, however, be opened occasionally and the fish examined. If there were any risk of the pickle turning stale, it should be poured off and fresh pickle substituted, the fish being well washed in clean pickle before being repacked. As a precautionary measure, the fish might be taken out, washed, and repacked after being two or three weeks in cure, even if there were no suspicion of staleness.

When required, the pieces of fish should be taken out, well washed in clean, fresh water, and smoked in the same way as the milder-cured fish. Owing to the rich nature of the fish, this is the only method by which it seems possible to preserve salmon for any length of time, apart from tinning. Dry-curing would fail to preserve such a fat fish. In Norway all the smoking is done in the chimneys of the dwelling-houses, in much the same way as finnan haddock curing was originally done on the Kincardineshire coast.

CONSUMERS' CORDAGE PLANT DAMAGED AT DARTMOUTH.

Orders Can Still Be Filled.

We learn with regret the Dartmouth plant of the Consumers' Cordage Company, Limited, was considerably damaged in the Halifax explosion.

Many of the employees were injured, fortunately none fatally. Mr. R. L. Graham, manager, however, was badly bruised and cut about the face.

The company is at work on the necessary repairs, and will soon have everything in normal shape. We understand that all orders on hand and any new business will receive prompt attention, and that orders which the Dartmouth plant cannot handle will be rushed forward from the company's Montreal factory.

EMBARGO ON OYSTERS AN ERROR.

The recent hold-up by U.S. Customs authorities of consignments of oysters to Canadian houses, was unintentional. There is no embargo on oysters from the United States, and Customs officials have been instructed accordingly.



The Leonard Fisheries

An industry is as great as the men engaged in it.

If a book were written describing the growth of the industrial life of Canada from the days of the Fathers of Confederation to the present time, it would contain some remarkable chapters. It is the busy manufacturing centres and huge plants hidden away in the recesses of the country that are bringing Canada into prominence in the world of commerce, and enabling her to play no mean part in supplying Great Britain with the requirements of the army in war-time. These plants are the work of big men, men with vision, ambition, courage and steady nerve, men who saw the opportunity and who had faith in the future. There is an element of romance in the speed with which this country has developed. It is as though the change had been created overnight, so amazing is the transition from bare fields and rocky shores to hives of productive industry.

The fish industry is one that has developed in a remarkable manner, and great strides are being made at this moment. Those at the head of the fish business have not been slow to realize that owing to their high cost, other staple foods can be substituted satisfactorily only by fish. An active propaganda has been instituted, and already the public is beginning to appreciate fish as a food, and to look upon the industry as one containing unlimited possibilities of development.

But even yet the average man of the street probably sits down to his meal of fish on the two meatless days a week without connecting the dish before him with anyone more remote than the corner tradesman. Behind the retailer, however, is the wholesaler, and behind the wholesaler is the producer, while behind them both are years of silent development, concentration and co-operation.

Among the leading firms that are contributing to the progress of the fishing industry in Canada, is the Leonard Fisheries Limited, they being to a large extent responsible for the automatic supply of fish in Montreal and other towns in eastern Canada. Although the present organization dates back but twelve months or so, it embodies the fish handling facilities, trade and goodwill of three of the oldest houses in the line.

Leonard Brothers of St. John, N.B., whose name was adopted at the time of the amalgamation, dates back to the palmy days of wooden sailing ships. In those days the Leonard family did a flourishing business in boat building and fishing at Leonardville, Deer Island, in Passamaquoddy Bay. Deer Island is just as primitive to-day as ever it was, but the Leonard's had an imagination that carried them beyond the pretty islands that dotted their horizon. In course of time they established packing houses in St. John and a selling organization in Montreal under the direction of W. F. Leonard and C. H. Leonard. Later, branches were opened at Westport, N.S., and at Grand River, Gaspé. Instead of confining themselves to the fish peculiar to Passamaquoddy Bay, they extended their line until it included all kinds of lake and river fish, even bringing halibut and salmon from the Pacific coast.

The firm of Matthews and Scott, which was also included in the amalgamation, was founded in 1885, at Queensport, Chedabucto Bay, off the Strait of Canso, N.S., and at Eastern Harbor, Cape Breton. This company brought another aspect of the fish industry into the amalgamation. Having seen the need for supplying the fishermen with the necessities of their trade, as well as with household requirements, they had some years before, opened a general store in



Plant of Leonard Fisheries, Ltd., at Port Hawkesbury, N. S.

connection with each of their branches. In this way they handled ice, bait, gear, clothing, groceries and drygoods, as well as fish of all descriptions, which was, of course, the outstanding feature of their turnover.

The third firm in the present corporation, introduced the Cape Breton trade, dating back no less than forty-seven years to 1870, when their head office was established at Halifax. The company was founded by the late Alexander Wilson, who later took his son, S. Y. Wilson, into partnership with him, forming the firm of A. Wilson and Son, general fish dealers at Halifax, Canso and North Sydney.



Head Office of Leonard Fisheries, Ltd., at Montreal.

In 1916, when the trade of Leonard Brothers was increasing beyond existing facilities, it was decided to amalgamate with the other two firms and to do business under the name of the Leonard Fisheries Limited. In addition, a large cold storage plant was purchased from the North Atlantic Fisheries Limited at Port Hawkesbury, as well as the wharves, buildings and producing equipment of the Canso branch of that company.

The workings of the large up-to-date plant of this notable combination is of especial interest, if only as an indication of the remarkable progress that has been made in the fish industry by the adoption of modern methods and automatic machinery.

To begin at the point of production, the company's fleet of vessels includes a large steam trawler that plies from the fishing grounds to port at a speed of fifteen knots an hour, laden with a cargo of fish that staggers the proprietor of an old-fashioned dory. "The Baleine," as she is called, is up-to-date in every respect, having a steel screw, triple expansion engines, electric lighting system, cold storage plant and all the latest appliances for handling fish. With this steamer it is possible to secure the catch and return to port in a few days, landing the fish in the cold storage plant without deterioration.

In addition to the service rendered by "The Baleine" the fishermen of the vicinity land their catches at the company's wharves, and are supplied with bait and ice ready for their next trip to sea.

The fish on landing from the boats are passed through various departments, according to the treatment they are to receive, such as the splitting room, smoke houses, pickling room, freezer, etc., and thence to the store

room. From the store rooms or directly from the boats the fish may be loaded on to the cars on the company's siding. The equipment includes ice crushers and chutes which permit the delivery of ice direct to the vessels at the wharves.

Their supplies of fish are drawn not only from their own boats and those of the fishermen of the neighborhood, but they also trade with the American fleet, which comes through the Straits of Canso on its way to the fishing grounds of the Gulf of St. Lawrence. Their market, in addition to the towns of eastern Canada, extends throughout the West, and to the larger distributing centres of the United States. No small item also is the fish supplied to the Canadian military authorities for their camps in Canada and Great Britain. Large quantities have also been sent to the Imperial army, the shipments made by this company for this purpose already amounting to over one hundred cars.

In contrast with the humble beginnings of each of the three amalgamated firms, the branches operated by the new organization are very large in number. They include most of the important fishing centres of the Maritime Provinces, such as St. John in New Brunswick and Halifax, Canso, Digby, Westport, Queensport, Mulgrave, Cape George, North Sydney, Ingonish, Eastern Harbor or Cheticamp, Port Hood and Port Hawkesbury, in Nova Scotia.

Few industrial corporations present the elements of stability and success which the Leonard Fisheries possess. This company is not so much the result of capitalization of assets and goodwill as it is a combination of men who have brought together three old and well established businesses for the purpose of eliminating unnecessary duplication of effort and to provide the large capital which the newer methods of production and distribution of fish demand. The steam trawler



Part of Fleet of Leonard Fisheries, Ltd.

brings to port every five or six days from 10 to 20 car loads of fish in a single cargo. If these are to be marketed as fresh they require to be dressed, iced, boxed, dispatched to destination and disposed of with a rapidity unknown of in any other industry. If the demand is not equal to the production the surplus has to be frozen, pickled, smoked or dry salted. Moreover, most fish can be caught only at certain times, and when they are in season an effort has to be made to secure, and store sufficient to supply the market throughout the year.

This requires large investments for freezing, curing

and storage facilities as well as an excessive capital for carrying stocks. The Directors of the Leonard Fisheries, Ltd., are all men well seasoned to the fishing business—men whose lives have been spent in it in one capacity or another, who have their all invested in it and whose future depends upon its success. Furthermore, none of them are dummies. Each is actively engaged at the point where he is of the greatest value.

The President, W. F. Leonard, Esq., is located at St. Johns, N.B., a point which combines both the business of production and distribution. He is assisted by Mr. W. W. Leonard.

Mr. D. J. Byrne, the Vice-President and General Manager, is to be found at Montreal, the headquarters of the company, where most of the work of distribution, practically all the collections, as well as the majority of the worries of transportation, etc., are to be taken care of. In order to relieve Mr. Byrne of a part of his worries and work, the company has lately engaged the services of an experienced sales' manager in the person of Mr. C. Pratts, formerly sales manager for The Andrew Radel Oyster Co., of Connecticut. Mr. Pratt is well known to the trade in the United States, Great Britain and Western Canada. He will have charge of the sales distribution. Another indispensable person at the Montreal office is Mr. W. H. Love, who has been with the Leonard people at this point for over seventeen years. He is well known to the trade of Montreal and district.

Mr. S. Y. Wilson is kept very busy at Halifax, a point, like St. Johns, N.B., which combines production and distribution, so that he finds it difficult to get away to attend the meetings of the Canadian Fisheries Association, of which he is the President.

Mr. R. T. Mathews lives at Port Hawkesbury, where, assisted by Mr. Leonard, Jr., he takes care of the large and varied operations necessitated by the existence of the cold storage plant which is located here.

Mr. W. P. Scott is located at Queensport, where the company not only handles quantities of fish product by independent fishermen, but as well from their own traps and gear, and does an extensive business in supplying fishermen with both ice and general equipment.

Stores are also operated at Canso under the direction of W. G. Matthews. At Eastern Harbor the business is under the direction of Mr. E. Ellis. Mr. A. A. Zinch, who for twenty years was eastern manager for A. Wilson & Co., has charge of the company's affairs at North Sydney.

SMELT FISHING SEASON OPENS.

Smelt fishing in New Brunswick opened November 28, and hundreds of nets were set from scows and through the ice at many places in the province.

The quality and quantity caught at Chatham and vicinity thus far have been small. The fishermen are getting 10 cents a pound, but expect to get more soon. At Rexton the price paid the fishermen is 7 cents per pound.

The U. S. is the principal market for smelts.

EXPORTATION OF CANNED LOBSTERS.

Canned lobsters can now be authorized for export license by Customs endorsement of usual shipper's export entry.

MORE TECHNICAL TRAINING FOR FISHERMAN.

Arichat, Nova Scotia.

Editor, Canadian Fisherman:

I have just received a copy of the Fisherman and find it more interesting than ever. I have been very busy this summer fishing off Canso. The fishing has been fairly good, with the result that I have an engine in my vessel now, a Canadian Fairbanks 12 h.p. It is a big help.

I have been speaking to some of the fish buyers around here and we are going to ask the Government to send some man around to the different fishing centres this winter to lecture on the methods of handling fish and impress upon the fishermen that every fish taken over the gunwale of his boat is used as an article of food by someone. You know that it is all important to have the fish looked after by the fishermen.

Fish that is carried all day in a boat with the gut in in the summer time and then landed on the Fish Buyer's Wharf at night is a poor article to try and make a dollar out of it — and even as long as 24 hours. Some fishermen keep them this way, but it is not the way a lot of fishermen who bring in large quantities of fish. A man in a small boat has a poor chance to dress his fish and keep them in ice, but those that are fishing in larger boats have a good chance to dress their fish after every run of the trawls and putting a small lot of ice on them.

The fish buyers are a pretty decent lot of fellows if we use them right. They willingly find free of charge, ice enough to keep the fish in good condition until sold. Bad fish on the market hurts the fishermen. If the man that buys it cannot make a dollar out of it he will not be anxious to buy our fish the next time and pay the price which good fish should bring. The same is also true of those who eat the fish.

Now let us get together as fishermen and help to keep the trade that has been open to us by putting the best of our efforts into the business. The different Governments of this country have been doing everything for the farmer. There are free lectures by the Professors from different colleges, also gifts of animals and seed which enables them to make the most out of their work, but as yet we never have had any help in the fishing line to get the most out of the business that is greater and more important than farming in Nova Scotia. We can all learn a lot yet in the fish and fish curing and the sooner we get it the better. Our Fisheries Association is doing good work and I bring this to your attention.

(Signed) FRANK YOUNG.

BRITISH FISHING LAWS SUSPENDED.

In exercise of powers conferred upon him under the defense of the realm regulations, the Food Controller, with the consent of the Fishery Board for Scotland, has authorized the use of methods or appliances, otherwise unlawful for the purpose of taking fish in the parts of the sea adjoining Scotland either within or beyond the territorial waters. The landing and sale in Scotland of any fish which it would otherwise be unlawful to land or sell is also authorized.

DEFROSTED FISH.

In Great Britain, frozen fish are called "defrosted" fish. The name has a good sound, and might be used in Canada to offset the popular aversion to "frozen."

Some Supposed Race Characters in Young Herring, Known as Bay of Fundy Sardines

By PROFESSOR EDWARD E. PRINCE,
Dominion Commissioner of Fisheries, Ottawa.

The sea-herring, owing to its great commercial importance, has attracted the attention of fishery experts for a long period of years, and few points in its structure, habits and life-history, have been neglected. Excepting the salmon and trout, probably no fish has formed the subject of more assiduous biological investigations. Much, however, remains to be done, and information respecting the movements and migrations, the local races and seasonal variations, of the herring in our own and other seas. The Biological Board of Canada, with the approval of the Minister of Naval Service and Fisheries, wisely determined to secure the aid of Dr. John Hjort, the famous Norwegian fishery expert, and his researches in the Gulf of St. Lawrence and off the Nova Scotia Coast, last fall and during the present summer, will not only be of unusual interest but of great practical utility.

1. Do Sardine Catches Endanger the Herring Supply?

A very extensive and valuable fishery, valued at over a million dollars annually to our fishermen, has been long carried on in the waters of Southern New Brunswick, between 400 and 500 traps or "weirs," of wicker-work or brush and net, studding the shores of Passamaquoddy Bay and the adjacent bays and islands, and providing enormous quantity of small Canadian herring, usually called "Sardines" for the flourishing packing industries of Eastport, Lubec, and other towns in the State of Maine. This so-called Sardine fishery, brought in 1914-15, \$1,349,000, and in 1915-16 \$1,226,236. Twenty years ago, in an official report, published by the Department of Marine and Fisheries (28th Annual Fishery Report, 1895, pp. XXXI—XXXII), I described this fishery, and raised the question: "Will the destruction annually of immature herring endanger the future supply of full-grown herring in our waters?" Must not the herring supply become extinct or seriously diminished if Canadian weir fishermen continue to capture vast schools of infant herring to supply the United States' sardine factories whose pack has ranged from \$2,000,000 to \$3,000,000 in annual value.

Herring, it is undeniable, have disappeared from many of their former resorts in the Bay of Fundy, and areas off Charlotte County shores, New Brunswick, but I stated in my report, that no sufficient evidence could be gathered to show that the "sardine fisheries" had really resulted so seriously as many persons had anticipated, and Professor Bensley pointed out, (Contrib. to Can. Biol. 1901, pp. 59-62), that other Clupeoids. (Shad, Alewife, etc.), had also declined, though not captured by the weirs in any great numbers.

2. Are There Different Races or Varieties of Herring?

One of the first points to decide, before any conclusions can be drawn, is the alleged existence of local varieties in the Bay of Fundy, and their movements and distribution. Early in August, 1916, I took the opportunity of examining at the Biological Station, St. Andrews, N.B., three familiar diagnostic features in the structure of the herring (*Clupea harengus*) taken

in the weirs in the St. Croix River estuary. I did so in order to determine the amount of variation existing, and to ascertain if evidence appeared that different local schools could be distinguished. I paid attention to the number of rays in the dorsal and anal fins, and the number of joints or vertebrae in the backbone or vertebral column.

3. Do Structural Differences Occur?

Zoologists state that the common sea-herring (*Clupea harengus* L.) of the Atlantic Coast has 56 vertebrae in the backbone, 18 supporting bony rays in the dorsal fin, and 17 rays in the anal fin. Owing to the enormous catches frequently made in the brush weirs in the bay near St. Andrews, and on the adjacent coast and islands, abundance of specimens can be readily obtained for such a comparative study as that which I began in the laboratory of the Biological Station. Of course, the accurate counting of small bones, in the vertebral column and the two median unpaired fins, is a slow and laborious process; but the results which I obtained are interesting.

4. Study of Herring Backbone (Vertebrae.)

Taking at random 100 herring from a quantity procured by the caretaker of the Station, varying from 5½ or 6 inches to 7½ inches (the smallest was 5 15/32 inches, and the largest was 7 11/16 inches in length), I found that over 50 per cent accorded well with the specific characters already mentioned; but there was a small percentage. . . higher and lower, and a very small percentage (4 per cent. to 6 per cent.) much above and much below. Thus the largest percentage had 56 vertebrae, viz., 28 per cent., but about as many had 57 vertebrae (i. e., 26 per cent.), while 24 per cent. had 55 vertebrae, and 8 per cent. had 54. Only 6 in a hundred had the highest number of vertebrae noted by me, viz., 58, and 4 per cent. had as low as 53 vertebrae; 8 per cent. had 54 vertebrae. In some specimens it was very difficult to determine the precise number of vertebrae, immediately behind the basi-occipital element of the skull, owing to the fact that they are often very much crowded together, and even with the aid of a strong lens, it was not certain occasionally whether there existed one more, or one less, in that region. Hence, putting together those with 56 or 57 vertebrae we have a total of 54 per cent. of the hundred fish examined.

5. Variation in Rays of Back Fin.

The further interesting fact was elicited by my examination, viz., that of those possessing 56 or 57 vertebrae, the largest percentage had the normal or specific number of dorsal fin-rays; viz., 14 per cent with 18 rays (56 vertebrae and 18 rays, 7 per cent; and 57 vertebrae, along with 18 rays, 7 per cent), while 4 per cent in both types had 19 rays. Again, one in a hundred fish (with 56 vertebrae) had, on the one hand, 16 or 17 rays; and 2 per cent had 20 rays. Of those with 57 vertebrae, 1 per cent had 17 rays, and

1 per cent had 20 rays. In the small number of fish possessing 58 vertebrae, 2 per cent had 18 rays, and 1 per cent had 16 rays. Curiously enough, of those with 55 vertebrae, one less than the accepted normal number (24 fish in one hundred) 6 per cent had one fin-ray more than the normal, that is to say they had 19 rays. Of those with 53 vertebrae (3 short of the normal) 1 in 100 had 16 rays, but 1 in 100 also had 19 rays. 8 per cent, as stated, had 54 vertebrae, and of these 1 per cent had 15, 1 per cent 16, 1 per cent 18, and 1 per cent 19 dorsal rays.

6. Anal Fin Differences.

The anal fin is of much importance taxonomically, and is of specific or even of generic value. The largest percentage of herring examined had 56 or 57 vertebrae, and 17 per cent of these had 17 or 18 rays; but 4 per cent of herring with 57 vertebrae had 16 anal rays, and 3 per cent had 17 rays (the accepted characteristic number); while 5 per cent had 18 rays or one in excess, and 1 per cent had 19 rays or 2 in excess. The normal type, possessing 56 vertebrae showed 15 anal rays in 1 per cent, 16 rays in 2 per cent, 17 rays in 5 per cent, 18 rays in 4 per cent and 19 rays in 1 per cent. The maximum number of anal rays noted, viz., 20 rays (3 in excess of the normal) was possessed by 2 per cent. This variation is curious and interesting; but still more so is the fact that those herring having the largest number of vertebrae (58), in no case possessed the typical number of anal rays (17); but in 1 per cent there were 16 rays (one ray short), and 2 per cent had 1 ray in excess, viz., 18. So also the typical anal-fin formula did not apply to those with 2 vertebrae short, for 1 in a hundred respectively had 13, 14, and 18, or even 19 rays, and the herring with 3 vertebrae short (viz. 53) had in 1 per cent 2 anal rays short (15) or 2 anal rays too many (19), but none had the normal number. About one quarter of the fish studied had 1 vertebrae less than the normal and of these only 2 per cent had the normal anal rays (17); 1 per cent had 16, 2 per cent had 15, and 1 per cent had 13, while 2 in one hundred had 19 rays and 3 in one hundred had 18 rays.

7. Apparently One Race of Bay of Fundy Herring.

These observations were made, as stated, on a hundred herring taken haphazard from a "Sardine Weir," and are regarded as half-grown migratory late summer-herring; but I had hoped to have examined a much larger number, in order to increase the value and application of the conditions observed. I shall continue my examination of these so-called "Sardines"; but the main facts, elicited by the study here detailed, will no doubt be merely confirmed, and will show that while there is no absolute uniformity in the diagnostic structural features investigated, but much variation within narrow limits, the majority of specimens centre round the recognized specific type, and possess 56 or 57 vertebrae, 18 or 19 dorsal fin-rays, and 17 or 18 anal fin-rays. A considerable percentage have one vertebra less, or one fin-ray more or less in the unpaired dorsal and anal fins, while very few so depart from the normal type as to have 2 rays less, or 2 or 3 rays more, viz., only one or two in a hundred fish furnish these exceptions. One interesting fact is noticeable, and the study of a large number of herring would add to its interest, viz., the complete coincidence in the number and percentage of dorsal and anal rays, in herring possessing the abnormal number of 58 ver-

tebrae. The few specimens obtained with 58 vertebrae agreed in having 16 dorsal and anal rays in 1 per cent of the fish, and 18 dorsal and anal rays in 2 per cent of the fish studied.

8. Age of Sardines.

I propose to extend my studies so as to include examination of scales, with reference to age and keel scales behind the ventral fins, also number of vertebrae with haemal arch, and other features; but so far these results confirm the research of Dr. Huntsman in 1915, and show that we probably have to do with one "age-group" merely, though the spring and fall hatched herring are mingled. The spring herring reach 3½ inches by their first winter and 6 inches in their second winter, while the fall herring are 5 inches by their second winter. The bulk of the sardine catch consists of herring 5 inches to 7 inches long in their third year (26 to 30 months), while the spring herring are 6 inches in their second year, and 8 inches in their third year (30 months.)

9. Are Vast Sardine Schools Recruited from East and North?

The possibility has been suggested that the amazing schools of young herring, which crowd, each year, the waters from the St. Croix estuary to Grand Manan, resulted from spawning beds and herring nurseries in western Nova Scotia, Cape Breton, and even the Gulf of St. Lawrence.

These distant schools of young herring, carried by currents, or migrating over the 400 or 500 miles of sea, between the Gulf of St. Lawrence and Grand Manan, would, it was imagined, keep up the numbers in these southern waters. If so, it is almost certain that there would be some "race characters" which would distinguish the Gulf herring from the Bay of Fundy herring. Dr. Hjort's results in 1914, show that there was a marked difference between the herring (spring spawners) in the Gulf and west of Magdalen Islands, and the open waters of the sea off Cape Breton and Nova Scotia. He regarded the latter fish as of the same type as the western Nova Scotia and Bay of Fundy herring. The age of the fish also presents a contrast, the Gulf herring being mainly of 5 years old, though some were 6 to 10 years old, and a few even 17 years, the 11-year fish preponderate, while the western coast type or sea variety are mainly 7 to 10 years old, and few 12 or 13 years old, while a small proportion near Halifax appear to be only 4 years old. The most valuable kind of herring, the fat or "matje" herring, are stated, by European authorities, to be from 3 to 4, or 5, years old, though farther north these fat herring may be a little older. In their fourth or fifth year they become mature and "spawning herring," and it is these mature herring which compose the principal catches in Canada.

10. Vast Herring Nursery Near Grand Manan.

We know where the young herring, 1-3 of an inch to ¾ of an inch long, abound. They form a wriggling mass of life on the surface waters from Grand Manan southwest for 20 or 30 miles, as Dr. Huntsman noticed in October this year. Where are the vast schools of fish older than sardines, but younger than the herring which constitute the main catches each year.

11. Where are the Schools of "Pat" Herrings?

As I said to the Conservation Commission (November 2nd, 1915), "Where are the sizes of herring which correspond to the Norwegian and Scottish herring? Are they, as is the case along the Norwegian coasts, mainly

confined to some special areas, or are they widespread in the open waters outside or inside the Gulf of St. Lawrence. Do they anywhere occur in such quantities and under such circumstances that a new fishery of supreme importance could be developed? That the younger stages or immature herrings must occur in vastly larger quantities than the larger and older ones is obvious. Possibly the younger year-classes are less numerous in a special year, or shorter series of years, but during a longer period of years, it is evident that older herring must be reduced in number in comparison with the younger individuals."

12. Further Researches Important.

One of the great tasks of our marine biologists is to discover the places where the valuable fat herring occur, and determine their migrations; and with better methods of capture, and improvement in handling, curing and packing, our Canadian herring industry may yet rise to the front rank of the herring fisheries of the world.

ARMSTRONG INDEPENDENT FISHERIES.

Hon. Hugh Armstrong, former provincial treasurer of Manitoba and one of the most progressive business men of the west, regards the food problem of Canada as a most serious one. He believes not only that every effort must be made to conserve the food supplies of the Dominion, but that greater production in all lines must supplement the conservation policy.

No man in Canada knows the fishery resources of the country better than Mr. Armstrong, and on the development and handling of these resources, in his opinion, depends in large measure the solution of the food supply difficulty.

Last spring Mr. Armstrong resigned from the management of the Armstrong Trading Company and accepted the position of western representative for the Booth Fisheries Company. He has resigned from that position and organized the Armstrong Independent Fisheries, the chief business of which will be dealing in the product of the lakes of the Canadian west. He believes that the business done by the new company, owing to his acquaintanceship both with the sources of production and the markets available for the sale of fish, will result in a wider market and a more equitable distribution of that product.

FOOD CONTROLLER'S BULINGS ON WINTER-CAUGHT WESTERN LAKE FISH.

It is to be distinctly understood that the prices set to the fishermen are to be paid at primary railway shipping points and not on the ice or at the lake shore.

It is the practice for producers to make advances to fishermen or furnish them with nets and equipment to be paid for out of the catch of such fishermen to be purchased by the producer, and this practice is defended on the ground that it stimulates production. The Fish Committee of the Food Controller's office request that any cases of sale of catch to producers other than producer making such advances (until such advances are paid) shall be brought to the attention of the Fish Committee for such action as they may deem advisable.

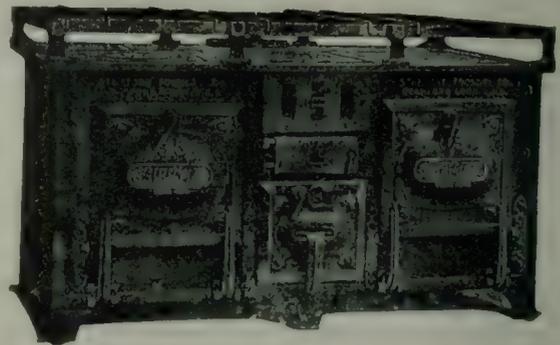
SHIPMATE RANGES.

The Largest Line — The Oldest Makers.

Probably every reader of the Canadian Fisherman knows the Shipmate line of vessel ranges, but all of them may not know that the STAMFORD FOUNDRY CO., STAMFORD, CONN., who manufacture "Shipmates" is nearly a century old, having been established in 1830, and that they make the largest line of vessel ranges in the world.



A few remarks regarding the Shipmate line are worthy of mention. Up to a short time ago the five-foot range was the largest size made, but something larger than this was required in many cases and now three-foot sections are being produced. These sections can be combined with the No. 65 (five-foot size) in as many units as may be necessary so that ranges of almost any length desired may be had. The five-foot section has one fire and two ovens. The three-foot section has one fire and one oven.



The fireboxes in both sections are regularly fitted for burning hard coal, but special fixtures can be furnished for burning soft coal, and each firebox has can be thoroughly sliced from the front of the range on its front a slicing door so that the soft coal fire without moving vessels that may be over the fire.

The three-foot section is made also in the form of a complete range by itself; or it can be combined with other three-foot sections and ranges can be had in lengths equal to any multiples of three, as 6 feet, 9 feet, 12 feet, 15 feet, etc.

One important feature of all these ranges is that they can, any of them, be so taken apart as to be in sections 23½ x 28 x 30 inches, and can be put through a doorway of 24 inches in width.

Mr. H. R. Silver, of Halifax, N.S., was in Ottawa recently, consulting with the Food Controller on the report of salt fish from Nova Scotia. Mr. Silver is a member of the Nova Scotia Fish Committee advising the Food Controller.

TRANSPORTATION SUBSIDY ON PACIFIC FISH.

By an Order-in-Council dated December 8th, the payment by the Government of two-thirds of the transportation charges on certain varieties of Pacific Coast fish, has been amended to cover all fish, other than halibut or salmon, by all means of transportation and in any quantity, from points in British Columbia to points in Alberta, Saskatchewan and Manitoba.

ATLANTIC SALMON HATCHERIES.

A total of over 30,000,000 Atlantic salmon eggs have been collected by the Fish Culture Branch of the Department of the Naval Service for the hatcheries in Quebec and the Maritime Provinces. The season which has just come to a close has been a most successful one, and all the hatcheries are filled to capacity. The following quantities of eggs were collected:—

York River Pond, Que.	600,000
Tadoussac Pond, Que.....	3,639,000
New Mills Pond, N.B.	1,554,500
Miramichi Pond, N.B.	14,106,000
St. John Pond, N.B.	6,035,000
Margaree Pond, N.S.	4,259,000

Total 30,193,500

SUMMER CATCH OF SEA FISH SHOWS INCREASE.

A report on the results of sea-fishing operations in Canada for the six months from April to September, and also for the month of October, has been issued by the Department of the Naval Service. It is stated that in comparison with a similar period last year the landings of cod and halibut on the Atlantic coast have increased by over half a million hundredweight. The herring catch for the six months this year, however, was far below that of last, amounting to only 645,844 cwts., as compared with 946,487 cwts. The quantity of salmon taken on the Atlantic coast during the season of 1917 was 1,578 cwts. short of the previous season's catch.

In spite of the fact that there was an extra month's fishing for lobsters, along the southern part of the Gulf of St. Lawrence, this season's pack is short of last. Since the opening of the season on the 15th of November, 1916, until the end of the 10th of September, 1917, there were packed 181,227 cases, while 70,321 cwts. were used fresh or shipped in shell. The figures for the preceding year show 188,545 cases packed and 94,409 cwts. used fresh or shipped in shell.

Particularly rough and unfavorable weather during October greatly interrupted fishing operations in the Atlantic, with the result that total landings of the chief kinds of fish were much below the figures of last year.

In the whole of the Atlantic provinces there were 153,640 cwts. of cod, haddock, hake and pollock landed during October this year, as against 242,580 cwts. a year ago.

The total value of sea fish landed in Eastern Canada during October was \$736,567, as against \$886,095, for October last year. The total value of the various kinds of sea fish at the point of landing, on both coasts, for the six-month period in 1917, was \$11,325,547, as against \$12,493,143 for the same period in 1916.

FISH DISTRIBUTED FROM GOVERNMENT HATCHERIES.

Figures issued by the Naval Department November 28 show that the large number of 1,490,671,104 fish were distributed from the Dominion fish hatcheries during 1917. Whitefish were distributed in very large number by the hatcheries, a total of 497,332,000 having gone to re-stock the Canadian waters. More than six hundred million lobsters were distributed and 180,000,000 pickerel. The distribution of sockeye salmon totalled 68,794,300 fish.

THE FISHERIES PROBLEM.

An editorial in the Toronto Globe recently says:—

During the war, especially since the Food Controller and the Fish Commission took a hand in the business, the consumption of fresh fish has greatly increased. Many are using it regularly for the first time, and many have it on their tables two or three times a week where formerly they had it once. The greater sale is partly due to lower prices as compared with meat, and partly to the response to the patriotic appeal to substitute fish for beef and bacon. It has been a welcome addition to the stock of wholesome food in a period of scarcity.

Will this boon last only during the war? Will the business go back to the old conditions of restricted supply and high prices? The Government has interfered to advantage, and it is probable that the advantage will cease if the interference is removed. Why should plans not be laid now to satisfy permanently the demand for fish which has been stimulated by the efforts of the Dominion Commission? One great obstacle in Ontario is the long rail haul from the present sources of supply in fresh and salt waters to the large centres of population. The cost and weight of ice in which fresh fish must be packed add so much to the cost of carrying and handling that it cannot compete in cheapness with meat, having regard to food values, unless there is a great increase of the supply in the waters nearer the markets. The small lakes and streams in this Province, except in remote parts, and even the Great Lakes near the cities and towns, have been depleted. Most of the lake fishing is in the hands of large concerns, which find it more profitable to export the bulk of the catch to the unlimited United States market, with its better facilities for distribution.

Apparently fresh-water fish can only retain an important place in the Canadian dietary by a vigorous policy of fish propagation and replenishment in convenient waters, joined to a marketing organization which will protect consumers. Fresh sea fish is being sold in quantities in Ontario, but experts say prices must remain high unless the coast fishermen use steam trawlers more extensively. The fisheries problem is deserving of the earnest attention of the Government, with the object of placing the industry on a new basis. In any plans of food production the fisheries cannot be overlooked.

The "Bay State Fisherman" is the name of a neat little four-page monthly magazine published by the Bay State Fishing Company, Boston, Mass. Here's congratulations to our small brother, and a long life to him!

BILLINGSGATE MARKET.

London, November 10th, 1917.

On the whole, conditions have shown an improvement this week. Landings at many ports, notably Grimsby and Fleetwood, have shown a distinct improvement, which has been reflected in heavier deliveries at Billingsgate, where arrivals have averaged in the neighborhood of 480 tons daily. In the earlier part of the week, the increased quantities available resulted in some decline in prices, but from mid-week onwards values again appreciated, partly owing to the greater demand arising from the easier conditions on the previous days, and partly by the shortage at ports other than those mentioned, such as Hull, Aberdeen, Milford Haven, etc.

The autumn herring fishing at the East Anglian ports of Great Yarmouth and Lowestoft, which usually runs well into December, shows signs of finishing. This is much to be regretted, as there will be no other herring fishing in home waters until the New Year. In pre-war days this did not matter so much, as generous supplies of herrings were received from Norway from December until April, and even May. No doubt, Admiralty restrictions — unavoidable under present circumstances — are responsible for the early termination of the East Anglian season. In ordinary times, there were no restrictions on the areas which could be worked provided they were outside territorial waters, but with the fish moving into deeper waters the fleets have been unable to follow the shoals because of the prohibitions of the Authorities.

The frozen salmon trade is going through its usual seasonal experience, being more or less dormant, as is always the case when native fish are out of season. Other kinds of frozen fish are offered at the following figures by importers: Cod, 7d; witches, 8d; fresh haddocks, 7d per lb. by the case of about 200 lbs. nett. The cod and haddocks are in excellent condition, but the witches are rather thin when compared with similar fish from home waters. Trade is not fast for any of these fish.

Flatfish of all kinds continues very expensive, especially halibut and lemon soles, these two kinds often making as much as, if not more than turbot, selected varieties changing hands at upwards of 20s per stone of 14 lbs. regularly. Frying fish, too, still commands famine rates, dogfish selling up to 11s and 12s, and roker to 14s and 16s per stone.

A feature of this week's markets has been the comparatively generous shows of plaice, prices for which have dropped appreciably. Cod has predominated at Hull, but has been rather scarce at Grimsby and Aberdeen. Sprats are now coming in more freely, but are worth a lot of money. Smoked fish—bloaters and kippers—remain expensive, large quantities being taken daily by the Army. Whittings have been rather prominent. Soles have been much more reasonable.

For the next few weeks supplies may be expected to vary from day to day, the weather being very uncertain at this time of year. Trade except for one or two kinds, now falls away until after Christmas, when inquiry revives, and there should be a good sale for choice frozen fish, provided this fish is brought prominently before the public.

It is rather surprising that some enterprising merchant at your side has not tried the possibilities of the London market for skinned dogfish. There is a huge demand for this fish, if in good condition, from fish friers, who freely give 10s, 6d and more per stone for

fresh "dogs." Best frozen "dogs," if suitable for frying, should certainly be worth round 5s per stone, and might even make more.

London, November 17th, 1917.

In the early part of the week landings at East Coast ports were comparatively good, but there was a shortage at West Coast centres. As the week progressed, however, supplies shortened up generally, and the report that the trawlers at one or two East Coast ports had been recalled from sea by Admiralty orders strengthened salesmen's hands. Prices have not shown any violent fluctuations, but from mid-week onwards soles became quite reasonable. Among flatfish, plaice has been most prominent, and good fish have been selling round 16s per stone, although selected sizes have on occasions gone as high as 25s. Fewer herrings have come in from Great Yarmouth and Lowestoft, but generous supplies have been received from the numerous small stations in Cornwall and Devon (while Irish mackerel has been prominent. The good arrivals of the latter two kinds of drift fish have prevented prices of trawled from soaring too high, but present indications give no reason for altering the opinion previously expressed that supplies will be short and prices high for the next month or two.

Billingsgate had a welcome addition to its supplies this morning, in the shape of three trucks of loose trawled fish, consisting of whittings, plaice, roker, and some prime fish, consigned to a well known salesman, Mr. Peter Forge, by the Naval Authorities at an East Coast port. "Loose" fish is the term applied in this country to fish sent in railway trucks without first being placed in packages. This fish, was in fine condition and met ready buyers at remunerative rates. Consignments of this nature are sold in Billingsgate by public auction.

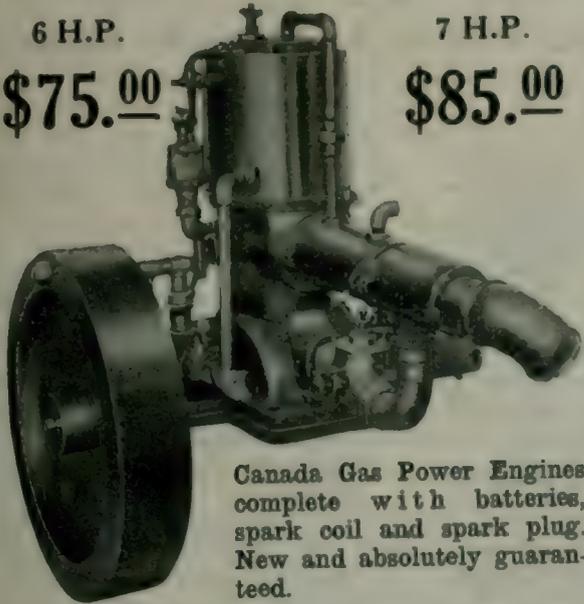
Statements are being circulated to the effect that it is the intention of the Government to import special shipments of frozen fish from Canada this winter. Should this be the case it is to be hoped that the fish will be marketed at Billingsgate, and that full publicity be given to the project in the daily press. If this be done, there need be little doubt as to the success of the venture, provided the fish arrives in good condition.

London, November 24.

Aggregate supplies this week have been fairly satisfactory, but towards mid-week boisterous weather presaged a shortage, and this prevented prices from falling to any appreciable extent, so far as the ports were concerned, merchants being eager to have supplies in reserve in view of an approaching shortage. In the consuming centres, however, prices, although still ruling high, have not given any margin for profit when compared with cost rates at the coast. This has been largely attributable to the fact that somewhat generous consignments of mackerel have come in from Irish stations, and owing to delays in transit the condition of much of this fish has not been of the best. As is inevitably the case, this has made buyers low-minded, which has re-acted on the values given for white fish. It is many years now since supplies of mackerel have come from Ireland as regularly as they have of late, and to the same extent, consignments to individual salesmen being quite liberal. This, of course, is the outcome of the embargo on exports, as in normal times the bulk of the catches of mackerel taken off the coasts of Ireland, principally the South

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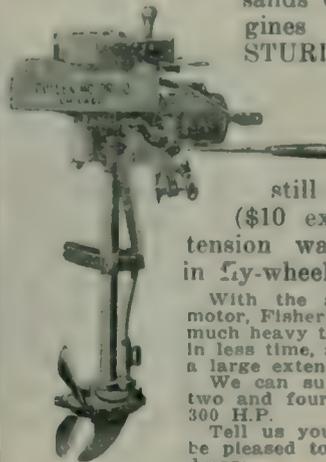
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Western districts, are pickled for the United States and other foreign markets.

Herrings have been much scarcer, and prices have risen in sympathy; as high as £9 has been paid in Billingsgate this week for barrels of salted herrings, but trade has been very slow at this figure.

Among flatfish, plaice has again been prominent, and compared with other kinds has been fairly reasonable; soles, too, have fallen heavily in value. It is a curious feature of the fish trade in this country, that when supplies generally are short and prices excessive, soles are so often quite reasonable. This week these fish have been down to 1s 9d per lb. in Billingsgate—quite a normal figure.

To sum up, conditions this week have not been conducive to successful trading, excepting perhaps from the vessel owners' point of view. There has been slightly more call for frozen fish, and there is little doubt that this class of food is slowly, in fact very slowly, but none the less surely, increasing in favor.

Billingsgate, London, Dec. 1, 1917.

This week scarcity has reigned supreme at all markets, owing to severe weather at sea, gale succeeding gale. The natural result has been that in the resulting scramble to secure supplies merchants have rushed up prices to a high level, so much so that prices at the coast have on occasions been as high as, and in some cases higher, than those ruling in the provincial markets. As an instance of the excessive prices ruling, at Grimsby on Wednesday—fish of a rather large size—touched £10.10.0 per box, this figure working out at nearly 20s per stone. Some relief was given to the markets by the arrival at Hull on Thursday of a convoy from distant waters, but unfortunately the quality of this fish left much to be desired, although even bearing that fact in mind, prices showing little reduction.

Herrings have been exceptionally scarce, and have freely made £7 0 0 and more per barrel. The one bright spot in the oasis of shortage has been comparatively good supplies of sprats, but the famine values current for other kinds have been reflected in the big rates realized for sprats. Another result of the scanty deliveries has been a decided run on frozen fish, holders asking as much as 1s 6d per lb. for frozen salmon by the case.

At various ports on different days some kinds have been entirely absent. It is fairly obvious that the fish trade in this country is going through a very trying time, as apart from the vessel owners whether limited companies or individual owners, business is being carried on at a loss in many instances.

Steps are being taken to remove the prohibition on the prosecution of fishing operations within territorial limits—three miles from shore at low water; in addition, areas what are known as "extra-territorial waters"—areas such as the Moray Firth, off the north-east coast of Scotland, and areas round the Irish coasts, which have been closed by the Government Departments administering the fisheries, will in all probability be thrown open to trawling for the period of the war. Even then, supplies will prove inadequate for requirements, and immediate steps should be taken by the authorities, in conjunction with the Dominion Government, to encourage, and give facilities for the importation of supplies from Canadian waters.

At present fresh haddocks, cod, hake, colefish, pollock, dabs, salmon and halibut, from Canada are offer-

ing, but for some reason or other the firms which occupy the premier position in the fishing industry of Great Britain do not appear to have been given the opportunity of distributing this fish.

CAILLE ENGINES IN THE FISHING INDUSTRY.

The Caille Perfection Motor Company of Detroit, Mich., are issuing a very attractive monthly house organ. "The Compass," which should prove of great interest to marine engine users, and those contemplating the purchase of same. The December issue contains an export section, under the supervision of Mr. J. H. Blake, their Export Manager, and gives a fair idea of the company's large connections in Canada, Newfoundland and other countries. In an article dealing with export shipments, Mr. Blake gives the following timely suggestions to prospective purchasers:—

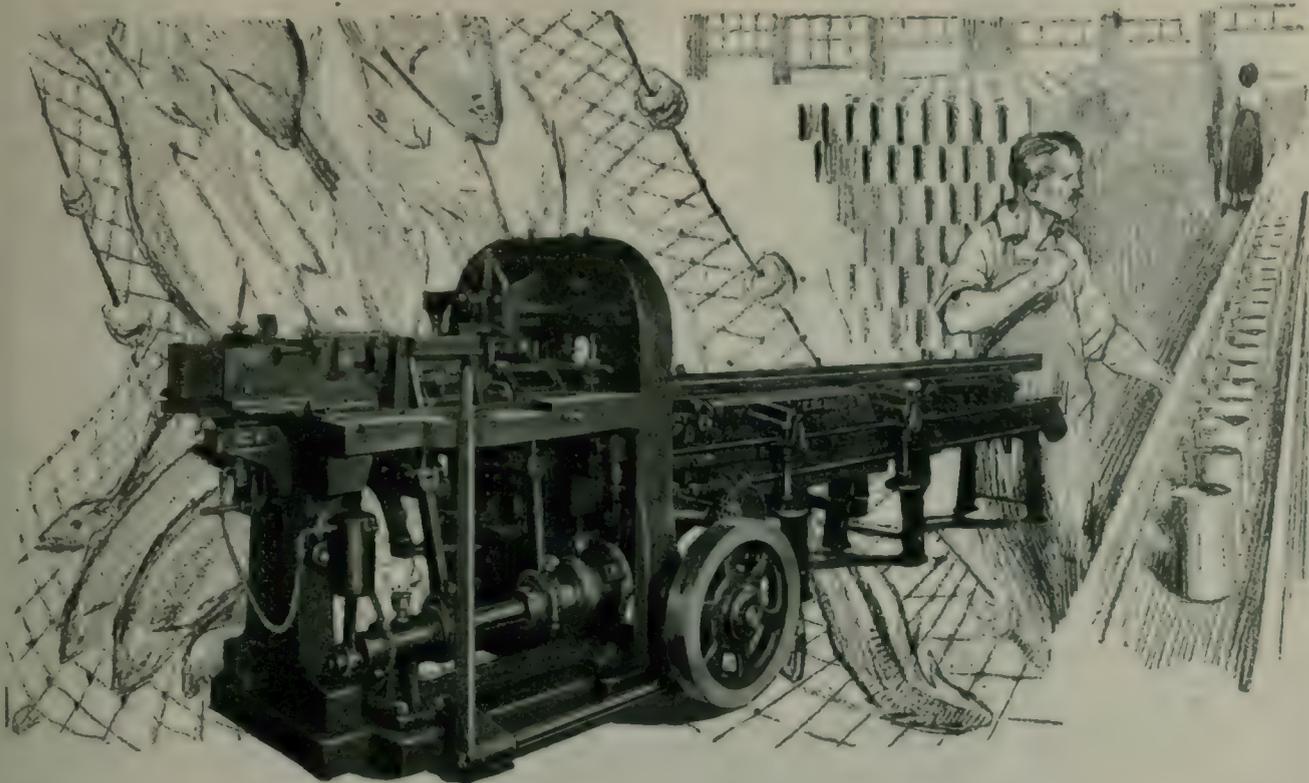
"Since the European War became general, the difficulties attending export shipments have multiplied until at the present time quick shipments have become almost impossible. In the first place, our own Government requires all shippers to obtain an Export License before the great majority of American products can be shipped anywhere, even to neutral countries. Secondly, steamship tonnage is extremely scarce, and sailings infrequent. To some of the neutral countries of Europe additional permits, or Letters of Assurance, must be obtained from the Allied Governments before the steamship companies will accept freight. Railroad traffic in all directions is greatly congested, frequently causing shipments to miss connections at seaboard points. These conditions cannot be bettered while the war situation remains unchanged, and we are, therefore, compelled to suggest to our friends abroad the necessity of ordering supplies of motors as far ahead as they can possibly arrange."

The Caille Perfection Motor Company is represented in Canada by the Perfection Motor Company (S. Thornton) Montreal, Que., J. H. Davey, Port Albernie, B.C.; Chas. W. Goyetche, Arichat, N.S.; John Thomas, Graham Island, B.C., and in Newfoundland by F. G. House & Co., St. Johns. In the latter colony approximately 2,000 Caille engines are in use in the fishing industry.

EXPORTATION OF FISH.

Arrangements have now been made with the War Trade Board, Washington, until further advised and Collectors of Customs are authorized to issue licenses for dried, cured, prepared, salted and smoked fish to all points in the United States for local consumption or to foreign points if shipped direct from Atlantic ports. If routed via a United States port and shippers hold license from War Trade Board, Washington, that will be sufficient authority for Collectors of Customs to allow exportation by endorsement.

In connection with shipments referred to "to foreign points" when shipped direct from Atlantic ports; that is, where they do not route via an American port, will you please note that by "foreign points" the ruling is hereby given that this will mean to all points in North and South America including the West Indies. Therefore, in the meantime, for any shipments to other foreign points shippers will require a license. For shipments routed via United States to foreign points regulations remain as at present, namely—license required to be secured from the War Trade Board, Washington.



“CANS!---MORE CANS!”

When the run of fish is good that is the cry. If the pack is to be successful and profitable the machines that meet emergencies must be dependable.

The supply of cans must meet the incoming rush of fish smoothly — always ahead, no stoppage for repairs, no failure on the part of any of them to perform its share.

“Bliss” Automatic Can-Making Machinery is used in every part of the world where cans are required—is the development of nearly sixty years—can be depended upon.

“BLISS” AUTOMATIC LOCK-AND-LAP SEAM BODY-MAKER No. 22-N is the machine illustrated above. Shown with automatic suction blank feed and roll solder attachment. Production speed upwards of 150 per minute.

Write for Catalogue Section No. 18-A



E. W. BLISS COMPANY

Main Office and Works; BROOKLYN, N.Y., U.S.A.



1857

CHICAGO OFFICE
Peopl.'s Gas Bldg.

DETROIT OFFICE
Dime Bank Bldg.

CLEVELAND OFFICE
Union Bank Bldg.

1917

LONDON, S.E., ENGLAND, Pockock Street, Blackfriars Road

PARIS, FRANCE, 100 Boulevard Victor-Hugo St. Quen

Is the Price of Fish High?---Some Facts

By J. A. PAULHUS,

Pres. of Educational and Publicity Committee, C.F.A.
 "Eat More Fish, But Pay More For It." Under this heading in one of our weeklies appeared a few days ago an article, which is unfair to the endeavors of our Food Controller, and a reflection upon the standing of the fish trade of this country. It may be admitted that fish is selling to-day at a higher price than it was two or three years ago. In this it has simply and naturally followed the trail of all commodities in this Dominion. However, fish is still much more economical than butcher's meat. For instance, one can buy many varieties of our sea and lake fish at a retail price of 12c to 15c a lb. on an average, while butchers' meat ranges from 25c to 45c a lb. Bacon sells at 50c lb., eggs at 60c dozen, and butter at 54c lb.

Of course, if a customer demands a scarce kind of fish—some species which is out of season, or which is a scarcity at the time of buying; or if he asks for a fish imported from far-away seas; or for a fish which is such a delicacy, a rarity, that it has to be put up in a particular way and carried in a special manner from the producing point to the market; or if the same customer buys service and attention also—the price will vary accordingly.

It would be unfair to judge from these particular cases of high price to general. The law of supply and demand and trade competition will always settle the price of any commodity in any market. Academic dissertations will never do it. If we want cheap fish we must increase production. We must also abolish the duties on imported fish. As it is, the consumer has to pay a protective duty ranging from 20 to 30 per cent, besides the war tax on fish that we don't produce ourselves. Moreover, we have even to pay duty on fish delivered in our own ports, and, in some cases, on fish caught in our own waters.

The article in question says that in food saving propositions there is an element of patriotism and of money making also. Perhaps so, but in the fish business there is no more money making (and not so much) than in the boot and shoe business, the automobile business, or the "movie" business. Still, these weeklies are not so eager, so intent to find fault with them. Instead, they fix on provision dealers and denounce them as profiteers, extortioners, thieves, etc., thereby appealing to the prejudices of the consuming classes.

It would be wiser for these weeklies to explain rationally the economic situation of the country. The consumer is better off at the present time than he has ever been. It is true prices of all commodities have advanced, but the distribution of wealth in this country has increased comparatively and advantageously.

We have a proof of this in the Statistics published by our Savings Banks, which show the enormous sum of nine hundred millions of dollars, or nearly half a billion more than at any period before the war. One cannot eat an apple and have it; we cannot sell all our land and water products and keep the same amounts. Instead, we have the money. We are really suffering from too much prosperity. The buying

power of money is depreciated. When butter, eggs, meats were selling at a ridiculously cheap price years ago, the consuming classes were not complaining of the prices—most of them had no money to buy at any price. To-day they have the money, and they are complaining of the prices. And the people who were influencing public opinion then were doing the same demagogic work they are doing to-day—agreeing with the public that the consumer was right and everything else wrong.

As regards the fish business especially, the Food Controller is not trying, under cover of patriotism, to deceive the customer. His sincerity in this instance cannot be doubted. His work is one of the most arduous tasks ever undertaken. It is well known that our food supply of fish is limited only by our capacity to produce. Contrasted with butchers' meat supply, production is all in favor of fish. Hogs and cattle cannot be raised in a year or a few year's time; and at this particular epoch, when whole herds are destroyed by the allurements of high prices, a meat famine will be staring us in the face long before the present war is over.

It is to prevent such a calamity and to counteract the evil effects of a meat famine, and at the same time develop a great national resource—the most permanent that the country possesses—that the Fish Committee of the Food Controller's Office has undertaken a campaign of publicity, appealing to the common sense of our people and to their patriotism.

In encouraging and supporting the Fish industry, they allow a considerably large amount of foodstuffs to be diverted for the use of our soldiers at the front, and the soldiers of the Allies, and thus help to win the war and augment at the same time the material welfare of Canada.

HOW A FISHERMAN FIGHTS FOR LIFE.

Edward Nickerson, of Barrington, a member of the crew of the Yarmouth fishing schooner Yafico, had a narrow escape from drowning recently. While the vessel was 15 miles off Yarmouth Light, Nickerson was in his dory attending trawls. A sudden squall came up and Nickerson was thrown from the dory, which was capsized.

He managed to divest himself of his rubber boots and part of his oil clothing. Coming to the surface he managed to get on the bottom of the dory only to be washed off. Again diving, he secured the painter of the dory, which he brought to the surface and made the end fast to the plug on the bottom of the dory. He then climbed back on the dory, and holding on to the line with one hand, with his other he waved his hat and coat in an endeavor to make himself seen by those on the vessel.

While he was doing this the men on the vessel were endeavoring to locate him, which was very difficult owing to the heavy seas which were running. He was finally rescued after being in the water three-quarters of an hour, and when placed on the vessel's deck totally collapsed. Much credit is due Capt. Theriault, of the Yafico, as well as his men for getting their shipmate to safety.

Mr. John P. Babcock, Assistant Commissioner of Fisheries for British Columbia, is at present in Ottawa consulting with the Fish Committee of the Food Controller's Office on Pacific Fishery matters.

W. R. SPOONER

Wholesale and Commission Dealer

Fish of all Kinds

119 Youville Square, - MONTREAL

I am in the market at all times to Buy or Sell on Commission, Fresh, Frozen, Smoked and Salt Sea and Lake Fish, in Carload Lots or Less.

Correspondence Solicited

Representing

National Fish Company, Limited

Halifax and Port Hawkesbury - N. S.

“National Brand”

*Haddies,
Fillets,
Kippers,
Bloaters,
Scotch Cured
Herring.*



Producers

*Fresh,
Frozen
and Salt
Sea Fish*

STEAM TRAWLER TRIUMPH.

LAKE FISH

J. Bowman & Co., Port Arthur, Ont.
Wabakin Fish Co., Montreal, Que.

BONELESS COD FISH

R. E. Jamieson, Rustico, P.E.I.

SEA FISH

A. W. Fader, Canso, N.S.

National Fish Co., Ltd., Halifax and Port
Hawkesbury, N.S.

THE MINIMUM REQUIREMENTS OF TIN PLATE FOR 1918, 1,500,000.

Present Shortage Expected to be Relieved.

The Food Controller's Office has recently issued a set of questions asking the manufacturers of fish and other containers to state the quantity of tin plate they have used for the last three years and also to estimate their requirements for the future.

A meeting was recently convened in the Food Controller's Office at Ottawa where representatives of the various can and packing companies met and discussed with Deputy Minister, F. C. T. O'Hara, the situation. This Committee appointed a smaller committee composed of T. N. Anderson, of the American Can Company, Hamilton; Fred R. Whittall, of the A. R. Whittall Can Company, Montreal, and F. S. Corrigan, Sheet Metals Product Company, of Toronto.



MR. FRED R. WHITTALL,
Managing Director A. R. Whittall Can Co., Ltd.,
Montreal.

The minimum requirement in Canada for 1918 is estimated to be 1,500,000 boxes. The United States Department has been asked for information as to the definite method to be followed in submitting applications for tin plate, as all plate coming to Canada comes from the United States.

The readers of the Canadian Fisherman who have received the questionnaire sent out for the purpose of obtaining exact information as to the quantity used, are asked to state their needs as definitely as pos-

sible. Any attempt at over-estimating requirements will be very detrimental. Every effort is being made to see that supplies are carefully sent out and judiciously distributed.

MORE FISH FOR PRAIRIES.

Committee Hopes to Prevent Waste in the Pacific Fisheries.

Mr. John P. Babcock, Assistant Commissioner of Fisheries for British Columbia and advisory member representing the Pacific Coast on the Fish Committee of the Food Controller's Office, was in conference with the Committee in Ottawa recently. Under the present practice of the halibut fisheries it is estimated that forty per cent of the total catch consists of gray, ling, and red cod, flounders, soles and herring. Halibut and black cod (sable fish) alone are being marketed. The other fish, although of high food value, are too soft to be handled without special care, and on the long halibut fishing trips, which last from eleven to sixteen days, they are generally shaken off the hooks and thrown back into the sea.

Mr. Babcock has been negotiating with the Deep Sea Fishermen's Union and the wholesale dealers in fish with a view to arranging a supply and a market in Alberta, Saskatchewan and Manitoba, where these fish, which up to the present have not been utilized, may be retailed at a popular price. The Federal Government has agreed to pay two-thirds of the transportation charges for all shipments whether in carload lots or otherwise, and it is hoped, through the efforts of the dealers, that the people of the Prairies may become familiar with these varieties of Pacific fish and a demand which will be created will ensure a market.

Last October 1,680,000 pounds of halibut were landed at Prince Rupert. It is estimated that the fishermen wasted 1,000,000 pounds of other edible fish through the difficulty of handling them and the lack of market for the unfamiliar varieties. The Fish Committee hopes to prevent this waste by developing a market in the Prairie Provinces.—Bulletin, Food Controller's Office.

WAR MEASURES—PROHIBITED EXPORTS.

Licenses for Export of Cured Fish, Etc.—Memorandum to Collectors of Customs.

Referring to Memo. 2139-B, etc., respecting food-stuffs, it is ordered that dried, cured, prepared salted and smoked fish for consumption in the United States may be licensed by the endorsement of the Customs Collector at the point of exit, on the usual Shippers' Export Entry.

Arrangements have now been made with Washington War Trade Board, and you are hereby authorized to issue licenses to all points in North and South America, including the West Indies, for dried, cured, prepared, salted and smoked fish shipped direct from Atlantic ports.

When routed via United States ports, if shippers hold license from War Trade Board, Washington, that will be sufficient authority for you to allow exportation by endorsement for shipments intransit through United States.

Note:—Frozen fish are to be classed as fresh fish and dealt with by frontier license as provided in Memo. 2139-B.

JOHN M. DOUGALD,
Commissioner of Customs.



*Tug Helena at St. John, N.B., belonging to the
Department of Public Works, Canada*

B-H **Anchor** **MARINE PAINTS**

Tugs, Fishing Schooners and Yachts that see constant service and experience hard usage should be protected inside and out with **B-H ANCHOR MARINE PAINTS**.

Our Marine paints include everything needed for the complete painting of a boat and a uniform high-quality runs throughout the entire line.

Among the varieties we manufacture are:

Hull Paints	Anti-Corrosive Composition
Deck Paints	Anti-Fouling Composition
Marine Zinc White	Lower Hold Composition
Cabin Enamels	Engine Enamels
Copper Paints	Aluminum Paints
White Lead	Red Lead

Write us for prices and full information.

BRANDRAM-HENDERSON LIMITED
MONTREAL HALIFAX ST JOHN TORONTO WINNIPEG CALGARY EDMONTON VANCOUVER

BEAUTY'S DIET.

Those desirous of obtaining (and retaining) a good complexion will achieve success far more speedily by the use of such foods as are conducive to a perfect digestion, than by the following of any other method. In travelling about the world the observant may notice that the complexion of the women of various fishing hamlets, is as well nigh perfect as possible. This is due, at least partly, to the simple fact that their diet consists of fish to a great extent, than which there is no food more easily assimilated by the human system, and the ensuing perfect digestion leaves the blood unclogged by poisonous particles which an over-charged liver seeks vainly to dispose of, thus rendering the skin of the eater of heavy foods, blotchy and unbeautiful.

A study of the method of life of the French working classes shows that the heaviest part of the daily menu is reserved for those of the family who are performing the most labor. The "demoiselles" who trip lightly to their labor each morning in the French Capital, are world renowned for their grace and charm.

The working girl of all the European countries has always the wild rose blush of perfect digestion mantling in her cheeks. Therefore Madam, or Mademoiselle, as the case may be, eat "Thy daily bread" with a view to increasing thy beauty. Plenty of fish for a month's diet will be found such a real beautifier that its user will be amazed at the change wrought in her appearance, and the cosmetics will be thrown aside and the time spent in their unprofitable use will be employed in more satisfying fashion.

The glowing rose that nature paints,
Will now sweet Nora's beauty make,
So rare that he who was heart-faint,
Would face dread peril, for her sake.

MARGARET McLAREN.

MAKES A DEMAND FOR CHEAPER FISH.

Order These Varieties at Hotels and Insist on Getting Them.

The Educational Department of the New England Fish Exchange issues the following bulletin.

It is to a more general use of grayfish, whiting, pollock and hake that we must look if we wish cheaper fish just now.

And, despite the fact that those who have tried these varieties praise them, and government experts urge their use, few restaurants or hotels can be found using them.

There is but one way to bring about their general use, and that is by asking for them. Whether you are a housewife or a diner in hotels, you can do your bit to win the war by continually demanding these varieties.

If you are buying your Tuesday or Friday food, ask your merchant for grayfish, whiting, pollock, hake, cusk, shark or skate. If he says he doesn't keep them, ask him why. Tell him you want them.

If you are ordering fish in a restaurant or hotel, ask for the same varieties, and insist that they be served or provided.

A general demand for these cheaper fish will, sooner or later, result in a better supply.

NEWFOUNDLAND FISHERIES.

The St. John's Herald, of November 13, reports from the Straits of Belle Isle and Labrador a catch of 224,000 quintals of fish for the season to date:

Following is a comparative statement of the catch of codfish up to November 3rd:

	1917.	1916.
Ferryland	28,200	25,565
Placentia and St. Mary's	60,170	40,490
Burin	201,155	131,800
Fortune Bay	124,815	75,485
Burgeo and La Poile	48,065	46,340
St. George's	12,940	7,130
St. Barbe	39,600	21,375
Twillingate	89,250	43,875
Fogo	37,825	12,530
Bonavista	131,855	70,910
Trinity	38,180	57,230
Harbor Grace	29,405	20,480
Port de Grave	12,520	6,210
Harbor Main	2,360	2,220
Straits	31,120	15,900
	<hr/>	<hr/>
	888,460	577,540

SHIPBUILDING PLANT AT HARBOR GRACE.

At present there is more than ordinary activity going on in the construction of the Newfoundland Shipbuilding plant at Harbor Grace. The staff of workmen have been greatly increased of late and there are now not less than two hundred and sixty employees on the pay roll, exclusive of the regular officials of the Company. The work of laying concrete beds for two breakwaters, as safeguards against ice conditions during the winter and spring, is being carried on and bases for huge derricks are under construction. From people who have just reached town from Harbor Grace, we hear, that matters are booming well at the scene of the outlook that big possibilities are in store for the second city. Operations for the construction of a siding are well in hand, the Reid Company having a staff of men engaged for some time doing the grading work, which is now practically finished. The railway ties and irons are expected along shortly to be laid.—St. John's Telegram.

SCALLOPS AND ANCHOVIES.

The shores of Cape Cod have been quite destitute of scallops since the season opened excepting in Chatham, where the crop this year has been the biggest in ten years.

Being scarce in all other sections, Chatham scallops are bringing from \$3.75 to \$4.00 a gallon. Most of them ultimately reach Boston markets.

Still another boom in the fish line sought Chatham's historic Mill pond for favorite waters when large schools of "anchovies," a fish found in the Mediterranean sea, struck in unexpectedly last week and the fishermen with lanterns and dip nets reaped a harvest of 500 barrels in a couple of nights. Maurice Phinney of Hyannis carried off a boat load of 100 barrels and the other 400 barrels were landed at the Chatham freezing plant.

— LINDE —

REFRIGERATING MACHINERY

IS USED BY THE MAJORITY OF THE CANADIAN FISH DEALERS.

Following are only a few of the many—

B. C. PACKERS ASSOC.
 ST. MUNGO CANNING CO.
 SKEENA RIVER FISHERIES
 KINCOLITH PACKING CO.

LEONARD FISHERIES LTD.
 DOMINION FISH AND FRUIT CO.
 PACIFIC COAST FISHERIES
 WALLACE FISHERIES

Our Machinery is "Made in Canada"

The Linde Canadian Refrigeration Co., Ltd.

MONTREAL: 37 St. Peter Street

TORONTO, WINNIPEG, CALGARY, EDMONTON, VANCOUVER.

Twenty-five Years' Service to Canadian Users

When the Engine Fails.

It may mean not only loss of cargo, but loss of life, therefore, the best motto is

"Safety First"

And when buying the engine fuel, always ask for the best not the cheapest.

White Rose Motor Gasoline
EN-AR-CO National Motor Oil
Insures Safety, Satisfaction, Speed.

Manufactured in Canada and sold at the following sea and lake ports, by

Canadian Oil Companies, Limited

Halifax,	St. John,	Quebec,	Montreal,
Toronto,	Owen Sound,	Sault Ste. Marie.	

ARRIVALS OF HALIBUT AND COD AT PACIFIC COAST PORTS.

November 1st to November 30th, Inclusive.

AT PRINCE RUPERT—

- Nov. 2—Omaney, U.S., 60,000.—Booth Fisheries Co.
 Nov. 2—Polaris, U.S., 65,000.—The C. F. & C. S. Co.
 Nov. 2—Convention, U.S., 8,000.—The C. F. & C. S. Company.
 Nov. 2—Director, U.S., 7,000.—The C. F. & C. S. Co.
 Nov. 2—Liberty, U.S., 30,000.—Royal Fish Co.
 Nov. 3—Nellie, U.S., 4,000.—Atlin Fisheries, Ltd.
 Nov. 3—Albatross, U.S., 18,000.—Atlin Fisheries, Ltd.
 Nov. 3—Geo. E. Foster, U.S., 15,000.—The C. F. & C. S. Co.
 Nov. 3—Andrew Kelly, U.S., 15,000.—The C. F. & C. S. Co.
 Nov. 4—Alameda, U.S., 4,000.—Atlin Fisheries, Ltd.
 Nov. 4—Saturn, U.S., 5,000.—Atlin Fisheries, Ltd.
 Nov. 5—Tordenskjold, U.S., 10,000.—The C. F. & C. S. Co.
 Nov. 5—Advance, U.S., 5,000.—The C. F. & C. S. Company.
 Nov. 7—Venus, U.S., 4,000.—The C. F. & C. S. Co.
 Nov. 9—Doreen, P., 8,000.—The C. F. & C. S. Co.
 Nov. 9—Carlotta G. Cox, cod 5,000.—Atlin Fisheries, Ltd.
 Nov. 10—Chief Zibassa, 15,000.—The C. F. & C. S. Co.
 Nov. 11—Jas. Carruthers, 70,000.—The C. F. & C. S. Co.
 Nov. 11—Alaska, U.S., 45,000; cod 2,000.—Atlin Fisheries, Ltd.
 Nov. 12—Lumen, U.S., 6,000.—The C. F. & C. S. Co.
 16. Alten, U.S., 75,000.—The C. F. & C. S. Co.
 Nov. 16—Republic, U.S., 75,000.—The C. F. & C. S. Co.
 Nov. 16—Vansee, U.S., 80,000.—The C. F. & C. S. Co.
 Nov. 16—Seattle, U.S., 65,000, cod 12,000.—The C. F. & C. S. Co.
 Nov. 21—Sunmer, U.S., 2,000, cod 34,000.—The C. F. & C. S. Co.
 Nov. 23—Liberty, U.S., 40,000.—The C. F. & C. S. Co.
 Nov. 23—Venus, U.S., 20,000.—The C. F. & C. S. Co.
 Nov. 23—Venus, U.S., cod, 7,000.—The C. F. & C. S. Co.
 Nov. 25—Polaris, U.S., 50,000.—The C. F. & C. S. Co.
 Nov. 25—Albatross, U.S., 20,000.—The C. F. & C. S. Co.
 Nov. 26—Ruth, 3,500.—Dybhaven.
 Nov. 26—Doreen, 5,500.—The C. F. & C. S. Co.
 Nov. 29—Geo. E. Foster, 50,000.—The C. F. & C. S. Co.
 Nov. 29—Andrew Kelly, 60,000.—The C. F. & C. S. Co.
 Nov. 30—Seymour, U.S., 35,000.—The C. F. & C. S. Co.
 Nov. 30—Adeline, U.S., 3,000.—The C. F. & C. S. Co.
 Nov. 30—Yakutat, U.S., 57,000.—Booth Fisheries Co.

Note.—All vessels not specified "U.S." are of Canadian registry. Vessels with no price shown belong to

the company which they delivered.

AT VANCOUVER, B.C.:

Nov. 2—Celestial Empire, 2,000; cod, 3,000.—The Canadian Fishing Co., Ltd.

Nov. 17—New England, 70,000; cod, 4,000.—New England Fish Co.

EUREKA REFRIGERATOR CO. BUILD FISH CABINET.

The Eureka Refrigerator Company Limited of Toronto are showing in their advertisement in another column a reproduction of the "Government" fish cabinet which they are manufacturing for the Fish Committee, and pushing strongly among the fish dealers of the country. This cabinet is the standard size, one that has been fully described in the columns of the Canadian Fisherman in earlier issues. The Eureka Refrigerator Company claim to be the largest exclusive



manufacturers of refrigerators in the British Empire. Their up-to-date plant is located at Owen Sound, Ontario, and they have a great advantage in manufacturing this line, due to the fact that all the lumber used in the product is cut by them on their own timber limits, manufactured in their own sawmill, and the slogan, "from the tree to the finished product," is particularly applicable in this respect. They manufacture a full line of all classes of refrigerators for the fishing industry, grocers, butchers, etc. as well as a full line of refrigerated counters and ice machines. They have issued an attractively illustrated catalogue, which will be gladly supplied to the trade upon request.

LIMIT OF CATCH OF WESTERN LAKES INCREASED.

By an Order-in-Council dated November 29th. the Fishery Regulations for Manitoba were amended so as to provide a limitation for Lake Winnipeg of 3,000,000 lbs. dressed whitefish for the summer season, in place of the former limit of 2,500,000 lbs. In Alberta the present winter fishing limits in Lesser Slave Lake will only be regarded as summer fishing waters, and Lac la Biche will be permitted, but hereafter these and winter fishing will be limited to purely domestic purposes. Next summer and thereafter, 1,500,000 lbs. of dressed whitefish will be allowed from Lesser Slave Lake and vicinity, which is 240,000 lbs. more than the present summer and winter limits, and from Lake la Biche, a catch of 500,000 lbs. of whitefish will be allowed instead of 500,000 lbs. of all kinds during the summer and winter seasons.

CONSULT YORK OWNERS

As to the BEST ICE MACHINE to buy

A few of the well-known FISH concerns who use them :

D. HATTON CO., Montreal.

WHITE & CO., Ltd., Toronto.

NATIONAL FISH CO., Ltd., Port Hawkesbury.

MARITIME FISH CORP., Ltd., Canso, N.S.

SMITH & CO., St. John, Nfld.

JOB. BROS., Ltd., St. John, Nfld.

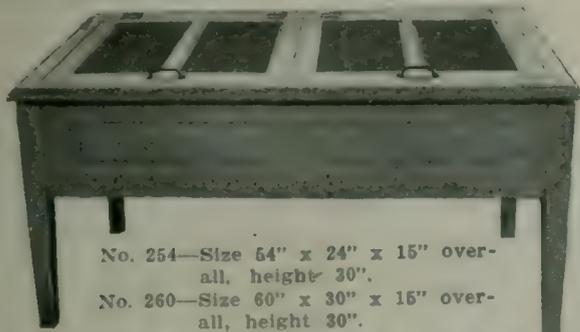
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S.S. Manhattan Wrecked

At two o'clock on the morning of November 15th, the ss. Manhattan, owned by New England Fish Company, and conceded to be the finest halibut fishing vessel on the Pacific coast, was wrecked at Lituya Bay, which is one of the most dangerous spots on the North Pacific Coast. The Manhattan is a total loss, and is now entirely submerged, and all that remains to be seen above the water at the present time is one spar.

This trip for the Manhattan crew and fishermen was an eventful one all the way through: Just prior to leaving on this voyage the Manhattan was in port several weeks at Vancouver and underwent a thorough overhaul, and sailed from Vancouver on October 29th under the command of Captain Kolseth, with a total of thirty-five men aboard. After leaving Ketchikan on her way north to the fishing banks, and early one morning while passing Point Augusta, they sighted a lone boat showing distress signals. On coming close they found the boat to contain a sailor from the Al-Ki, which vessel had been wrecked the day previous. The sailor had been left asleep in his bunk and woke to find the Al-Ki entirely deserted. The Manhattan took the Al-Ki sailor on board, and thinking perhaps others might have been left aboard the Al-Ki decided it was their duty to go to their aid. On reaching the Al-Ki they found a vessel by the name of Fernwood, and belonging to the Pacific American Fisheries alongside, which vessel took the Al-Ki sailor on board and proceeded southward. There were no other persons left on the Al-Ki, and as she was apparently quite deserted, the Manhattan men thought it wise to endeavor to salvage some of the stuff on board, and accordingly took various articles aboard the Manhattan, among them being blankets, some wearing apparel, a phonograph, etc. These articles were all placed in the pilot house of the Manhattan, and it was the intention of Captain Kolseth and the crew to turn these articles in to the owners of the Al-Ki on reaching Kitchikan and claim salvage. Being on the way to the fishing banks, however, it was decided best not to delay the vessel by entering at some port account of these goods, but rather to proceed to the fishing banks and settle the salvage matter on the return to Kitchikan. While on the fishing grounds the Manhattan caught approximately 90,000 lbs. of Halibut and Cod, and while returning, in a blinding snowstorm got off the course and ran on the rocks at Lituya Bay. At the time the vessel struck, the engines were going full speed astern, but still the force was such as to drive the rocks right through the hull, and the vessel commenced to fill immediately and settle forward. The chief engineer awakened by the crash, found rocks sticking up through the floor, and had barely time to grab some clothing and run for the deck. Others in the forward part of the vessel left their bunks hurriedly without clothing, and returned to find the water up to the second tier of bunks. Lituya Bay is exposed to the full swell of the Pacific, and when one dory was put over on the port side it was immediately smashed to pieces. Then six dories were put over the starboard side, and inside of fifteen minutes after the vessel struck, the men were all safely in the boats, but had no food, water, and little clothing. Some of the dories had oars and extras to spare, some sails and some not, so by dividing up they were all outfitted in this respect. One dory contained two

skates of gear, and this the men decided to keep in the event of finding it necessary to fish for food. The dories all stayed near the Manhattan in the hope of getting back aboard and getting some food, water and clothing, but she turned broadside to the swell, and commenced breaking up.

The men then left her for the forty-six mile row to Cape Spencer. Very fortunately there was not a gale blowing, else the boats could never have lived through. The men became famished for food, and the boat with the gear landed and taking the herring bait from the hooks, roasted same and ate them. The others were not so fortunate, and rowed for twenty-nine hours before reaching Cape Spencer, where at a cannery they received food and drink. Shortly afterward five of the six dories were picked up by the Mariposa, and the sixth dory was later picked up by the James Carruthers. The Mariposa landed the men she picked up at Juneau, where they were immediately arrested for looting the Al-Ki. The other men were later taken to Juneau and also held on the same charge. These men were given a hearing, and are all now at Vancouver, although some of them are to come up for trial at Juneau in January. The Captain saved his log book, and this is being kept by the authorities at Juneau.

The ss. Manhattan was a steel vessel, built in Philadelphia in 1905, of 219 tons burthen, with a speed of twelve knots per hour. Up until two years ago she was a coal burner, but at that time the latest oil burning equipment was installed which gave her the widest range of steaming days of any of the halibut fishing steamers, and enabling her to go far to the Westward and return. She recently had a large steel deck house built, completely covering her amidships, which made her especially suited for the winter fishing on the Northern banks.

BIG N. F. FLEET.

Losses of sailing vessels in the Newfoundland trade through storms, German raiders and German submarines since the war started have been more than made up by building within the colony and purchases abroad. The sailing fleet now number 125 vessels, and 17 more are on the stocks, the total of 142 making the largest locally-owned fleet in a generation. This is exclusive of boats used only in the island trade. The fleet, made up of schooners ranging from 100 to 400 tons, has a capacity which will enable the colony to take to foreign markets the entire catch of cod in island waters, estimated at about 1,500,000 quintals, or 168,000,000 pounds.

FIRST CARGO N.F. HERRING ARRIVES AT GLOUCESTER, MASS.

Sch. Smuggler, the first of the Newfoundland herring fleet arrived here November 30. She is from Bonne Bay of Islands, N.F., and had 1,100 barrels salt and pickled herring.

There are two other vessel arrivals, sch. Marsala from Gaspe with 112,000 pounds of salt cod and 56 quintals cured fish.

The gill netters landed on the pollock Wednesday and Thursday, and several big catches were made. Receipts over the two days are estimated at 300,000 pounds.—Daily Times, Gloucester, Mass.



ORDER NO. 6.

Office of the Food Controller, Ottawa

WHEREAS, by an Order dated at Ottawa, the thirtieth day of November, 1917, it was, amongst other things provided that on and after the first day of January, 1918, no person other than a fisherman or retailer shall deal in Canadian fish to an amount exceeding one thousand pounds in any one calendar month, without first obtaining a license from the Food Controller:

I Do Further Order

1. That the license fee for a wholesale fish license payable by any person engaged in the wholesale fish business during the twelve months immediately before the first day of January, 1918, shall be in accordance with the following schedule:

(A) When the value of the fish dealt in does not exceed \$100,000 per annum the fee shall be \$10.00.

(B) When the value of the fish dealt in does not exceed \$200,000 per annum the fee shall be \$20.00.

(C) When the value of the fish dealt in does not exceed \$300,000 per annum the fee shall be \$30.00.

(D) When the value of the fish dealt in does not exceed \$400,000 per annum the fee shall be \$40.00.

(E) When the value of the fish dealt in does not exceed \$500,000 per annum the fee shall be \$50.00.

(F) When the value of the fish dealt in exceeds \$500,000 per annum the license fee shall be \$50.00, and in addition \$5.00 for each \$100,000 or fraction thereof of the value of the fish dealt in in excess thereof.

Any person desiring to carry on business in more than one place or more than one premises shall pay the above fee for the place registered by the applicant as the head office within Canada, and in addition shall obtain a license for each branch, premises or place in which the business is carried on. In such cases a license fee of \$5.00 shall be paid for each sub branch, premises or place, other than the registered head office, at which such business is conducted.

2. That the license fee for a wholesale fish license payable by any person not continuously engaged in the wholesale fish business in Canada during the fishing season or seasons in the twelve months immediately before the 1st day of January, 1918, and who is desirous of conducting a wholesale fish business in Canada, shall be as set out in Section 1. The applicant for the license shall pay the sum of \$100.00, and shall, if such applicant carries on the wholesale fish business continuously during the fishing season or seasons of the period for which the license is granted, be entitled, at the end of the license year, to have the fee fixed upon the basis of the fees set out in section 1, and to a refund of any difference between the fees as so fixed and the said sum of \$100.00. But if such wholesale fish business is not carried on continuously as aforesaid, there shall be no refund and the fee shall be \$100.00.

3. That the license fee for a wholesale fish license payable by any applicant who has not been continuously carrying on an established commercial business in Canada during the six months immediately before the 1st day of January, 1918, shall be \$100.00.

4. That the value of the fish dealt in, referred to in section 1, shall be the value as determined by the wholesale sales of fish in the fiscal year of the applicant next preceding the date of application for license, and such sales shall include the value of all fish sold whether for home consumption or for export.

5. That all persons licensed under this Order shall give primary consideration to the requirements of the Canadian consuming market, and the Food Controller may cancel the license of any person who has refused to fill a legitimate and reasonable order from a Canadian wholesale distributor or from a Canadian retailer in good financial standing.

6. That each license holder shall send, on or before the fifteenth day of each month, to the Food Controller, monthly returns of the purchases and sales of fish made by such license holder for the preceding calendar month. Such returns shall be made on the forms to be obtained from the Food Controller.

7. That all applications for licenses shall be in the form "A" in the schedule hereto and verified by affidavit as required by such form.

8. That every license holder shall keep such books, invoices, vouchers and other papers and records as will enable the Food Controller or any person by him thereto authorized to verify any report or statement that such license holder is required to make to the Food Controller.

9. That in any case where a license is granted after the 1st day of July in any year, one half only of the foregoing fees shall be charged.

10. That all licenses shall expire on the 31st day of December in each year.

11. That in this order,

(a) "Fisherman" means a person actually engaged in the work of fishing and known to the trade as a "fisherman."

(b) "Wholesale fish business" means any business other than that of a fisherman or retailer when the quantity of Canadian fish dealt in exceeds one thousand pounds in any calendar month.

(c) "Retailer" means a person who sells direct to the consumer and known to the trade as a "retailer."

DATED at Ottawa, this 15th day of December, 1917.

W. J. HANNA,
Food Controller.

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Victoria, B. C.
New Westminster, B. C.
Prince Rupert, B. C.

Curling, Nfld.

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