REPORT OF THE INTERNATIONAL FISHERIES COMMISSION

APPOINTED UNDER THE TREATY BETWEEN THE UNITED STATES AND GREAT BRITAIN FOR THE PRESERVATION OF THE NORTHERN PACIFIC HALIBUT FISHERY

NUMBER 5

HISTORY OF THE PACIFIC HALIBUT FISHERY

BY

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FOREWORD

The present is a fifth report by the International Fisheries Commission upon scientific results obtained under the terms of the Convention of 1924 between the United States and Great Britain for the preservation of the halibut fishery of the Northern Pacific Ocean, including Bering Sea.

It provides the necessary historical background for the understanding of the present conditions of the banks, and is essential to proper regulation. Without this history the more detailed studies, both statistical and biological, now under way would lose much of their significance.

The International Fisheries Commission has had the help of an advisory board of four members: Dr. C. McLean Fraser, Dr. W. A. Clemens, Mr. N. B. Scofield, and the late Prof. John N. Cobb.

The investigations have been carried on by a staff under the direction of William F. Thompson, with headquarters and laboratory at the University of Washington, Seattle, U. S. A.

REPORTS BY THE INTERNATIONAL FISHERIES COMMISSION

1. Report of the International Fisheries Commission appointed under the Northern Pacific Halibut Treaty, by John Pease Babcock, Chairman, and Wm. A. Found, Miller Freeman, and Henry O'Malley, Commissioners. Dominion of Canada, Ottawa, 1928.

   Same. Report of the British Columbia Commissioner of Fisheries for 1928, pp. 58-76. Victoria, 1929.

   Same. Report of United States Commissioner of Fisheries for 1930, Appendix 1. U. S. Bureau of Fisheries Document No. 1073. Washington, 1930.

2. Life History of the Pacific Halibut (1) Marking Experiments, by William F. Thompson and William C. Herrington. In press.

3. Determination of the Chlorinity of Ocean Waters, by Thomas G. Thompson and Richard Van Cleve. In press.

4. Hydrographic Sections and Calculated Currents in the Gulf of Alaska, 1927 and 1928, by George F. McEwen, Thomas G. Thompson, and Richard Van Cleve. In press.

5. The History of the Pacific Halibut Fishery, by William F. Thompson and Norman L. Freeman.

Further reports will bear serial numbers and will be issued separately by the commission.

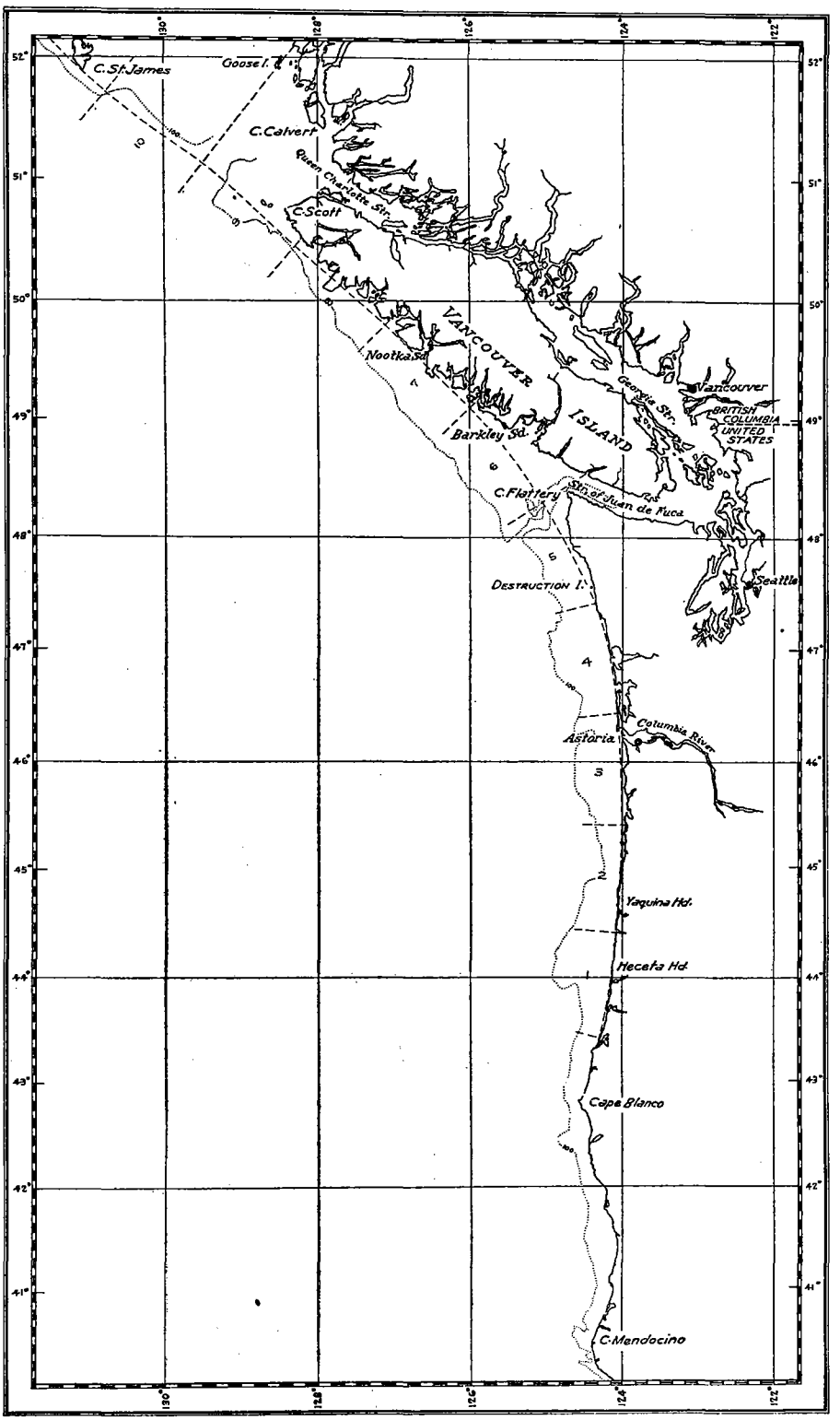

FIGURE 1.—Pacific Coast from Cape Mendocino to Cape St. James, showing the statistical areas by dotted lines.

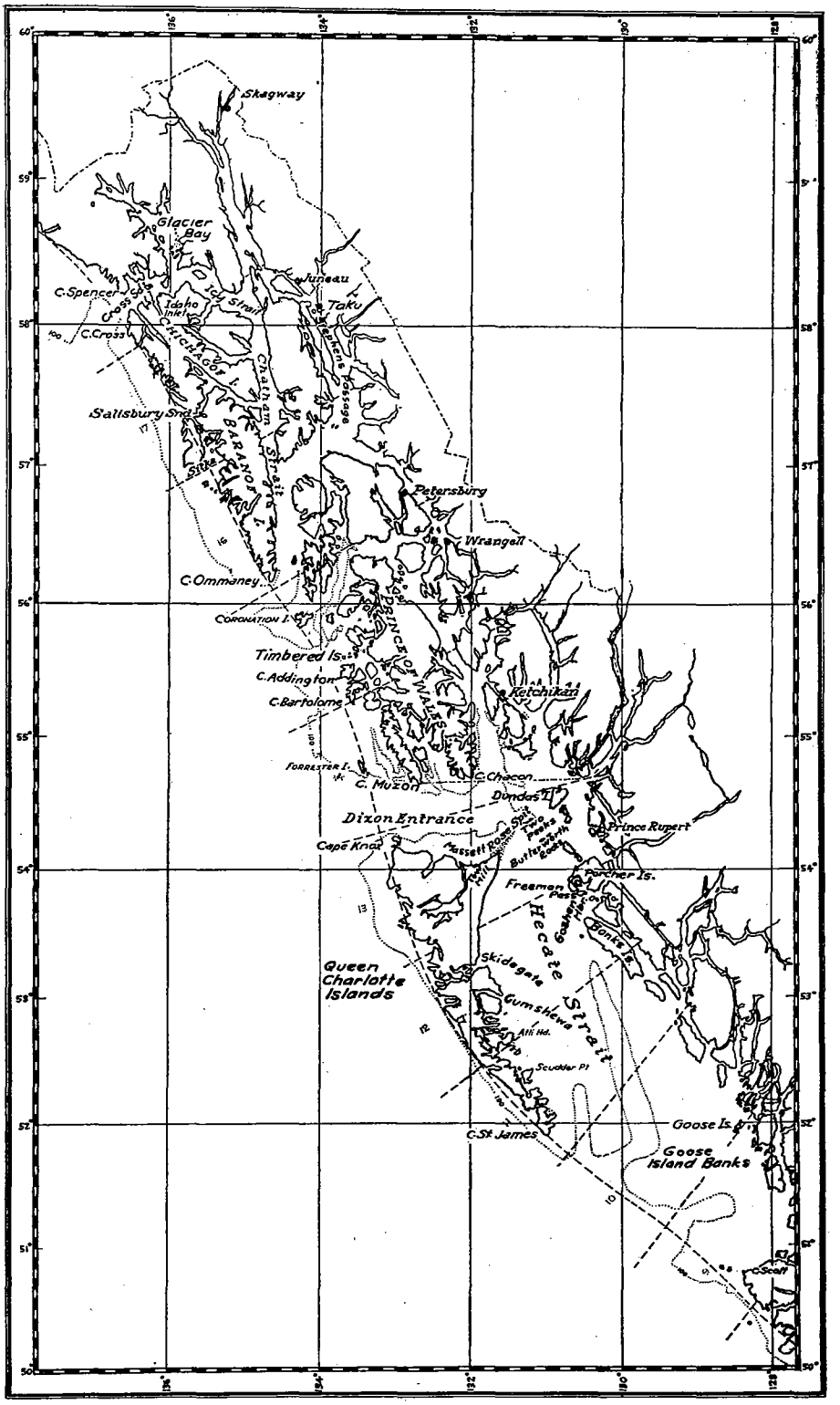

FIGURE 2.—Pacific Coast from Cape Scott to Cape Spencer, showing the statistical areas by dotted lines.

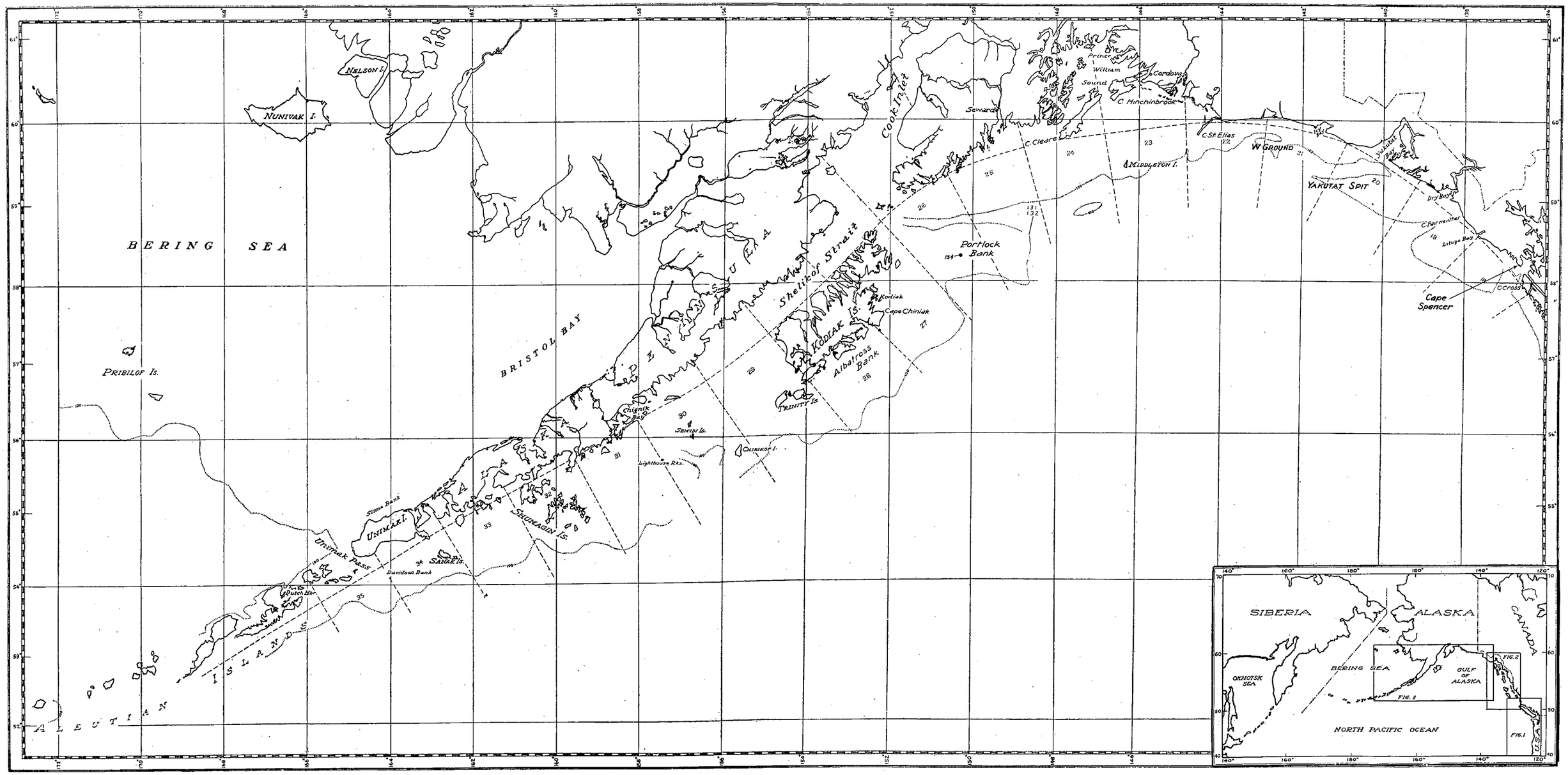

FIGURE 3.—Pacific Coast from Cape Spencer to the Aleutian Islands, showing the statistical areas by dotted lines. The insert shows the entire coast line divided into sections shown in Figures 1, 2, and 3.

HISTORY OF THE PACIFIC HALIBUT FISHERY

WILLIAM F. THOMPSON *and* NORMAN L. FREEMAN

CONTENTS

	Page
Introduction	10
Essential facts of the history	11
The Indian fishery	12
Estimated Indian consumption	14
The early commercial fishery	16
Railroads	17
First eastern shipments in 1888	18
Exploitation and depletion of southern grounds	20
Expansion of grounds, 1888 to 1910	20
Puget Sound	23
British Columbia	24
Alaska	28
Depletion	29
Expansion to deeper and to more northern waters	33
Mechanical evolution of fleet	33
Improvement of means of preservation	35
Shift to deep sea fishery in 1910	37
A new fleet	38
Extension of grounds north and south, and overproduction	39
Exploitation of east side of Gulf of Alaska, 1913 to 1922	39
Exploitation of new southern grounds	41
Overproduction, 1914 and 1915	43
Further mechanical evolution of fleet after 1913	44
Exploitation of banks west of Gulf of Alaska and the closed season, 1923	47
International relations and the closed season	49
Early treaty relations	50
Modus vivendi	51
Relationship in the Pacific	51
International Joint Commission	53
First halibut treaty	54
Closed season	54
Tariff of 1922	57
Bibliography	59

INTRODUCTION

The history of the halibut fishery has been a brief one, but even so the tendency is to regard it as permanently productive because it has existed as long as it has. It is the primary purpose of this section to show that this is not true, that the fishery has been maintained only by constant expansion, by increased efficiency of the fleet, and by higher prices. Its origin was due to the mechanical development of the age, and its survival is due to the fact that this mechanical development has proceeded at as fast a pace as depletion. The thorough understanding of these facts gives proper perspective, whereby the fishery, its economics, and the political background of its regulation can be understood.

In this history are evident the various influences which have determined the magnitude of the industry, the intensity of the strain it imposes, and the number of banks it has brought under contribution. These influences, such as markets, power, and new machinery, are the factors which modify so greatly the biological appearance of the species, and which bring about decline and depletion. When, as a result, conservation becomes necessary, it must be attained through measures taking into account these same factors which have played so great a part in the historical development of the present condition.

The great effect of inconspicuous mechanical changes and of cheaper power explains on the one hand the present existence of the fishery despite a greatly lowered abundance, and on the other indicates the promise of our scientific and mechanical civilization that the decline will be continued far beyond the limit which seems at present profitable. It no longer becomes possible to believe that the yield is a permanent one because it has been maintained until now, nor does its immediate cessation seem imminent. We should become conscious that our study of the halibut fishery is one of a continually developing strain upon a living species, and that we must gauge in some way this strain and its results.

It is a strain recklessly applied, without check save that of lessened economic return. The youth and giant growing strength of our civilization is nowhere more vividly shown than in this reckless reaching out into the age old treasures of nature for food. The mechanical perfection of this period, the demand for food in great centers of population, and the development of transportation, have been reflected in the ruthless stripping of the banks. The fishery is not stable, not settled nor permanent. It finds itself constantly faced by failure of the banks it depends upon, and it has lived thus far by the opening of new sources of supply and by increased efficiency. Faith in the future of this great fishery must be based upon the hope of indefinitely continued progress in efficiency.

Yet the halibut industry does not appear to be exceptional in its history. Its story seems to be that of others which have depended upon mechanical and economic advancement to overcome continuing depletion. But such stories, forming vital backgrounds to the more prosaic statistical records, are hard to decipher, and hard to make tangible because the most essential facts are to be found only in the passing memories of fishermen and dealers. What has been written here are the gleanings from endless discussions and a great mass of

random fact, selected and condensed, even yet telling but a fraction of what might be told.

The following history of the halibut banks is drawn from many sources[1] and is based upon printed statements and upon descriptive materials, rather than upon exact statistics which are dealt with in a later section. It owes its concrete detail in large part to the very many fishermen who have contributed their suggestions and memories. Even members of the crews of the "Mollie Adams" and "Oscar and Hattie" have reminisced for the benefit of these pages. Its conclusions are nevertheless trustworthy, because of the manifest continuity and the coherence of the picture they present, and because the statements of numerous men have been checked, one against the other.

The junior author and his father, the late Captain A. Freeman, have been responsible for the major part of the facts given in the section on British Columbia. Messrs. Harry A. Dunlop and F. Heward Bell have contributed many notes on all phases. Mr. Ernest Pegler has collected photographs and other data.

In the text the numbers following the locality names refer to the statistical areas into which the coast has been divided by the commission. (See maps, Figures 1, 2, and 3.)

ESSENTIAL FACTS OF THE HISTORY

The history as given in the following pages shows the growth of the fishery from that of the primitive Indians, the coming in 1888 of men and boats from the older halibut fisheries of the East, and the origin of the present commercial fishery at the time of the completion of the railroads across the continent. It shows how the fishery grew by the piecemeal exploitation of the older banks accessible to the small sailing schooner, while there occurred a gradual evolution of the latter into a vessel with auxiliary power, then into a powered schooner with sails of minor importance. The schooner with auxiliary power and the steamer together exploited the more protected waters and the shoaler areas. The depletion of these more accessible banks and the evolution of a type of vessel able to work on those of the outer coast, deeper and more exposed, came to a head at about the same time, the years 1910 and 1911.

In 1910 there occurred, as a result, the first great shift from an inshore to a truly deep-sea fishery. Then, with the building of an additional fleet of larger, abler vessels, the banks along the outer coasts were used, the fleet reaching Cape Ommaney (16) in 1911, Yakutat Spit (21) and as far as Cape St. Elias (22) in 1913. There were years of overproduction, expansion southward, and the increase of the total yield to its maximum, followed by partial exhaustion of the new banks.

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[1]Principal among the printed records are those of the United States Bureau of Fisheries, the Canadian Government Department of Marine and Fisheries, and the "Pacific Fisherman," the last mentioned being invaluable. The Vancouver and Victoria daily papers have contributed greatly.

The coming of the great European War brought new vessel construction and overproduction to a halt. Its consequences dominated the years from 1914 to 1921, depressing the landings and retarding expansion until after 1921.

The Diesel engine was perfected and adopted after 1921 in time for a new period of expansion of area. New methods of fishing "long-line" direct from the vessel were devised, and engine power was applied in many ways to render operations more efficient, to allow of longer hours at work, to enable the vessels to go farther for their catches. Meanwhile facilities were developed to handle the catch, such as new cold storage plants in convenient localities, and even a new and more northerly route to the markets of the East. The fishery was thus enabled to push farther and farther to the west, and the time came when it was possible to close the winter spawning season. The regulation did not halt, but rather accelerated, the process of expansion.[2]

The result of this expansion has not been to increase the total yield. But it has made many changes in the fleet and industry, as will be seen by a study of the available statistics.

THE INDIAN FISHERY

The primitive Indians had used a considerable amount of halibut presumably ever since they first came to this coast. Their fishery is of interest because of the amount taken, the methods used, and its influence on the early fishery.

The halibut is one of the most familiar of species to people of North European stock, for it has been caught in the waters of the North Atlantic from ancient times. The early explorers along the Pacific Coast of America recognized it readily when they met with it, as they very frequently did whenever they came in contact with the coast Indians. Captain Cook, in 1778, refers to the capture of one hundred halibut in an hour's time near the Shumagin Islands (32). La Pérouse speaks of the use of the "flétan" by the Indians of Lituya Bay (19) in 1786 (1798, Vol. 2, p. 127). Vancouver, Gray, Dixon, and almost every explorer of that time mention the halibut in unmistakable terms. Comment could hardly be avoided, especially in recounting dealings with the Indians of the outer coasts, so extensively was it used by them.

The halibut undoubtedly was at one time one of the most important foods of these Indians, next to the salmon. Their fishery had a well-developed technique, and a high degree of efficiency. To the European, the large awkward-looking hooks appeared crude, but to the Indian they were actually better than our modern barbed hook. Dixon (1789, p. 174), while anchored at Yakutat, sent out his whaleboat with seven men to fish halibut with hand lines, but found

[2]No attempt has been made in this section to treat the development of markets and land transportation. This would take us too far afield and would have only a distant bearing upon problems of regulation. Nor have subjects which must be dealt with in later reports, such as the use of small hooks, the exact measurement of the decline in abundance, and the increasing percentage of small fish, been anticipated.

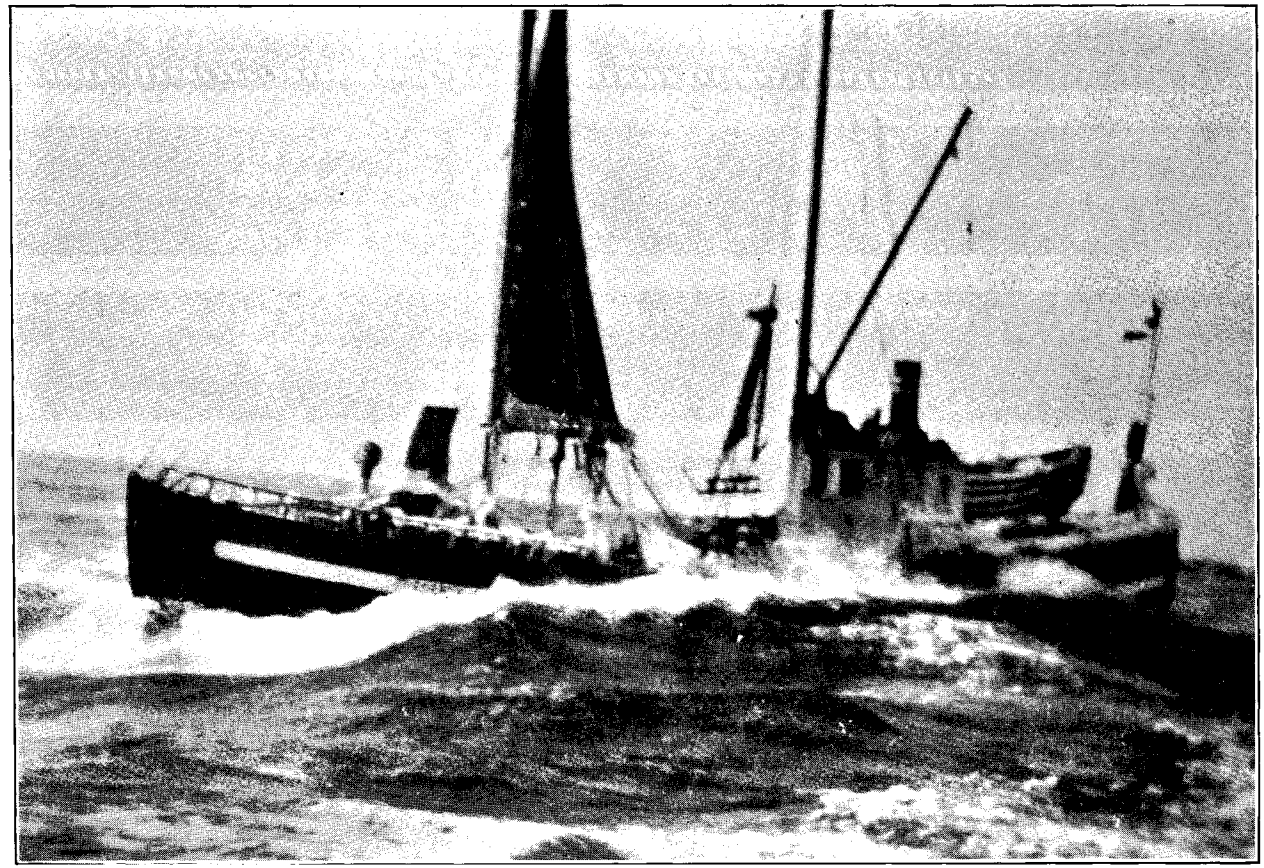

FIGURE 4.—The "Tordenskjold."

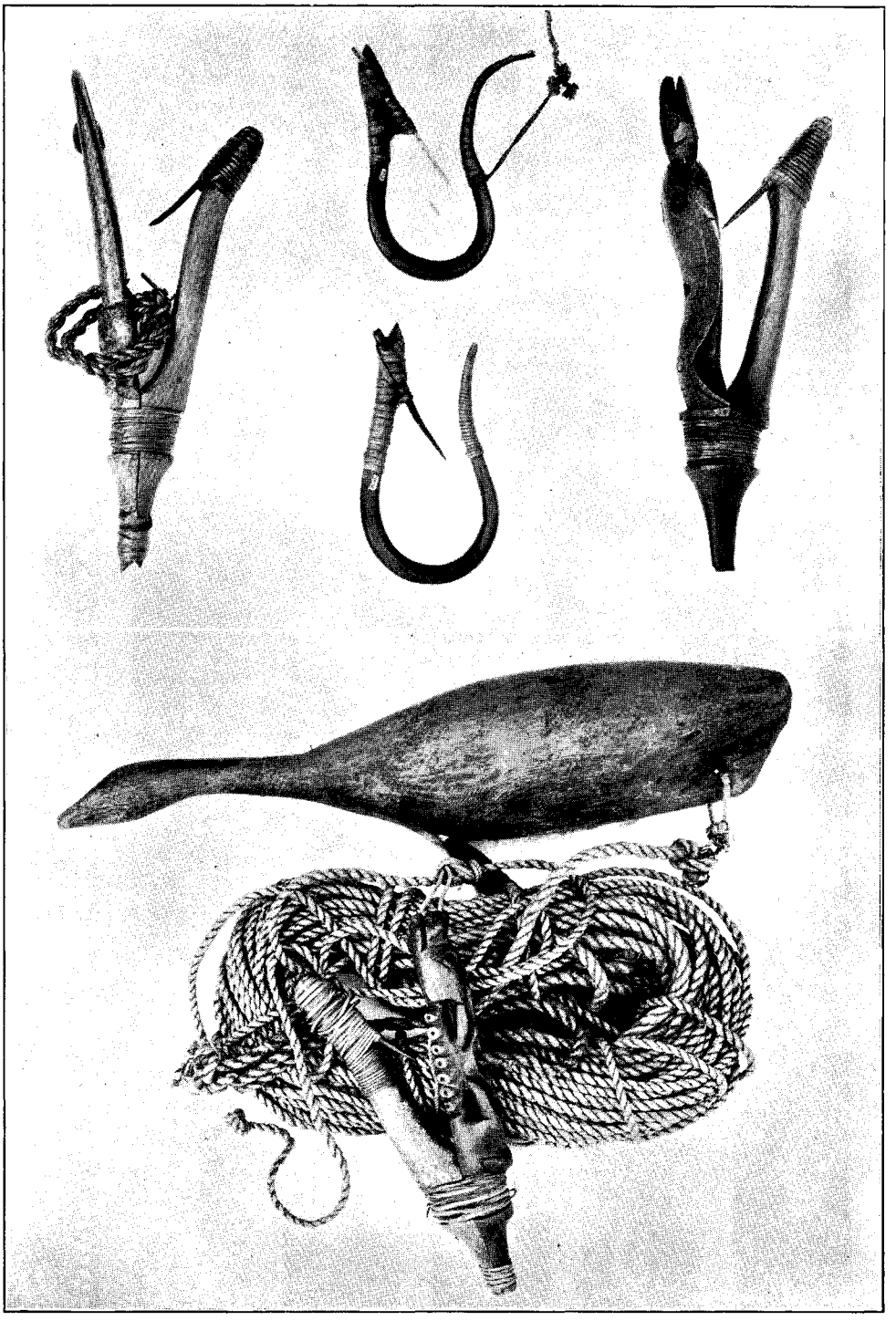

FIGURE 5.—Indian hooks, float and line. By permission of University of Washington Museum.

that they caught less than did two Indians, using their own gear, who happened to fish alongside on the same grounds. Although the Indians adopted cotton lines rather than their own laboriously made ones, they continued to use their own hooks and methods until late years. The senior author observed the use of such hooks around the Queen Charlotte Islands (12) in 1914, and was told of their greater efficiency by the users. Their disadvantage lay in unsuitability for use in great numbers, as in our present fishery.

In view of the great quantity of halibut used by the Indians, these methods and gear are exceedingly interesting. A number of observers[3] have given good descriptions, but as most of these are not accessible to the ordinary reader, it will be worth while to review them. Specimens of the hooks are found in many museums having material from the Northwest Coast.

The hooks of the tribes in Southeastern Alaska were large and made of wood, two pieces being lashed together at an angle of about 15 degrees. They were sometimes much carved. To one of these pieces the line was attached, and at the end of the other a barb was lashed firmly by means of strong fibers. Another type of hook characteristic of the Cape Flattery Indians of Washington was made of splints from hemlock knots, steamed inside the bulb of the giant kelp, *Nereocystus,* shaped as desired, and allowed to cool. The barb was of bone, lashed with strips either of spruce cut thin like a ribbon, or of the bark of the wild cherry. A hook in the possession of the writer is of iron shaped in the typical Indian fashion. The bait was lashed back of the barb by fibers made of the sinews of animals, such as the whale. As the halibut mouth is vertical, it took the peculiarly shaped hook readily, and the upper part to which the line is attached operated as a spring to hold the barb in the flesh.

The lines were made of twisted fiber of the cedar, of animal sinews or intestines, or of the giant kelp. The kelp lines were made by bleaching the kelp stems in fresh water, partially drying them in smoke, then stretching them repeatedly until they were the diameter of cod lines. They were brittle when dry, but exceedingly strong when wet. The twisted fiber or sinew lines were beautifully made by the squaws and had a uniform diameter and great strength. A line was made as long as 80 or 100 fathoms (Swan, 1870, p. 29), but this length was seldom used unless the black cod was fished for, as the latter was taken in greater depths.

In use the line was attached to a stone sinker with the hook close to it and apparently often, if not usually, suspended just off the bottom. At the other end of the line was attached a buoy made of bladders or skin and to it a float or a flag by which the strike of the halibut was signalled to the watching Indians. It was said that a canoe with two men could watch 10 or 15 such lines, but that if a larger canoe with more men was used, fishing was over the side. Fishing was commonly done in 10 to 20 fathoms of water, usually close to shore, but in the case of the Neah Bay Indians most often 15 or 20 miles west from Tatoosh Island (6), hence well out to sea.

[3]Dixon, 1789, p. 174; Lord, 1866, Vol. 1, pp. 142-150; Krause, 1885, pp. 170-196; Petroff, 1884, pp. 138-140; Swan, 1870, pp. 22-24; Turner, 1886, p. 88.

Lord describes the landing of a very large fish by two Indians using spears of great length (60 feet), to the ends of which barbed heads were attached as needed. When the great fish was brought near the surface a head having a line and bladder buoy was thrust into it, an operation which was repeated until the fish was unable to sound, when it was towed ashore and killed.

The wooden hook, however, was said usually to drown the halibut by preventing the closure of its mouth, leaving it without power to force the water over the gills. If this did not happen, the fish was clubbed before being taken into the canoe. Dead fish presented no difficulty in handling, even in the canoes, and if necessary, two canoes could fish together.

In fact, there is no doubt but what the Indians were entirely capable of carrying on successfully a halibut fishery sufficient to satisfy their wants. Catches per day of 100 fish to a canoe are recorded.

When taken, the halibut was in part consumed fresh, and the remainder was dried for winter use. It was cut into thin strips and allowed to dry rapidly without salt or smoke, leaving it white. Halibut was supposed to be best when white. However, at times it was impossible to dry it outside, and it was then placed on racks around the smudge fires in the large "warm houses" (Collins, 1892, p. 266), or hung around the walls of the smaller shacks. The slight decomposition produced by such drying is not necessarily distasteful, as the writer can testify. This drying of fish persists to this day, even where the Indians have relatively steady employment. Mute evidence of the importance of such things is to be seen in the great size of the houses, sufficient to shelter such activities in a wet climate.

As has been said, the halibut was most important to the coast Indians, especially at Neah Bay (near Cape Flattery) (6), Sitka (17), and the Queen Charlottes (12). Elsewhere the salmon exceeded it in amount, and on the whole, very greatly. Many other species were used also, such as the eulachon, or oolakan, and the herring. The oil of the eulachon and seal was preserved, and dried halibut was dipped in it before eating.

From this brief treatment of the Indian methods of fishing and preserving, it will be easily seen that they could fish in considerable depths and land many fish. Without understanding this the amounts credited to Indian capture by the early statistics of landings might be regarded with skepticism.

ESTIMATED INDIAN CONSUMPTION

The early reports of the Canadian Government (quoted in the reports of the United States Commissioner of Fisheries) give estimates as to the amount supposed to be used by the Indians, who, it must be remembered, were almost entirely dependent on fish. According to these reports, the value of the halibut was 6 to 10 cents per pound, which was certainly in excess of values later received by the white fishermen, and probably represented retail values. In 1884, the yield of the

regular fishery was 150,000 pounds, valued at $9,000, as compared to a value for the fish used by the Indians of $180,000, which, at the same rate of valuation, would equal three millions of pounds. By the same method of reckoning, the amount used by the Indians in 1885 was three and a sixth millions. There is no way of knowing how accurate these estimates were, but it is worthy of note that the total value of all fish used by Indians was placed at $4,885,000 in 1884. This was mainly salmon.

The statistics given by the United States Commissioner of Fisheries for Clallam County, Washington, relate mainly to the catch by the Indians of Neah Bay. A village has existed there from the earliest times of which exploring voyages give us information, and it has been distinguished by its halibut fishery. Swan (1870, p. 2) says that there were 663 Indians there in 1861. Wilcox (1895, p. 289) gives the population as 442 all told. They fished from the middle of June to the middle of August, with, in 1880, 40 to 60 canoes, of which, on an average, 15 were constantly employed, each with 4 or 5 men. The average daily fare of a canoe was 100 fish of an average weight of 25 pounds, according to Collins (1888), or 40 fish of 30 pounds each, according to Wilcox. These were caught 10 to 15 miles northwest of Cape Flattery (6). (Swan states 10 to 20 miles west of Tatoosh Island) (5). Collins estimates the yearly amount used as 600,000 pounds, the bulk used, fresh or dried, by the Indians themselves, which would approximate 4 pounds per person per day which, when dried, would be a fraction of a pound. This may possibly be an excessive estimate[4]. Returns from Clallam County in subsequent years were for the most part the estimated landings of these Indians, varying from 140,000 to 325,000 pounds, of which Wilcox states 280,000 were used as food by the Indians. How much the Indians actually sold to buyers from Port Townsend or other cities cannot be checked now. The returns listed by the above mentioned authorities are:

Year	Total	Neah Bay
1889	300,000	300,000
1890	280,000	280,000
1891	315,000	290,000
1892	359,000	325,000
1893	140,400	
1899	341,640	
1915	42,000	
1922	100,176	

Statistics are not furnished for any other village, although halibut must have been used by many.

Taking into consideration the fact that there were far more Indians along the coast of British Columbia than at Neah Bay, the records of consumption of halibut are understandable, at least in part, for many of the tribes of the Queen Charlottes and Vancouver Island were fully as dependent upon fish as were the Neah Bay Indians.

There are no estimates extant as to the use of halibut in Alaska. Since the tribes along the outer coast used salmon as well as halibut, and since the extent

[4]However, compare Elliott, 1886, p. 95, who estimates ten pounds per person for Cook Inlet Indians, referring, however, to salmon before being dried.

to which halibut was used decreased farther north and west, even an estimate based upon the numbers of Indians could not be relied upon.

It is not certain what part of this Indian consumption was included in data for subsequent years. It is certain, as has been said, that the catch at Neah Bay was included in the landings collected by the United States for the State of Washington. But subsequent to 1888, the total for all British Columbia was 605,000 pounds, which plainly did not include as great an estimate of Indian landings as was made a few years previously. It is more than likely that this amount is a normal increase over the previous total for non-Indian consumption of 150,000 pounds, since the Canadian Pacific was completed in 1885, and the increase in the white population must have been well begun. The districts including Victoria and Vancouver showed landings of 200,000 and 150,000 pounds, respectively, as compared to scattering amounts for other districts of the province, this concentration indicating the effect of local white consumers, since very little was, at that time, shipped east over the railroad. Therefore, aside from the Neah Bay landings, it is to be concluded that the halibut fishery, as recorded, owed its magnitude to the growing white population and to the shipment of fish eastward.

THE EARLY COMMERCIAL FISHERY

Previous to the completion of the Northern Pacific, in 1887, there are a few records of attempts to market halibut in the south. Ezra Meeker (1870, p. 22) states that an attempt had been made before that date to ship halibut from Puget Sound in "pounded" ice via schooner to San Francisco. Other attempts were made in 1874 (Bancroft, 1890, Vol. 26, p. 346), and in 1879 (Hittel, 1882, p. 359). Jordan (1887, p. 629) records that (before 1880) halibut were bought in Victoria by an American and shipped fresh to San Francisco on steamers. Also that a schooner belonging at Astoria (3) was engaged in transporting halibut from Cape Flattery and the West Coast of Vancouver Island to San Francisco, but that the attempt was abandoned after one season. A schooner, the "Carrie B. Lake," used a beam trawl out of Portland in 1885, catching an occasional halibut among other species. Doubtless careful search among old records would uncover other attempts, but it is certain that the great permanent commercial fishery began when catches were shipped from Tacoma in 1888 over the newly-completed Northern Pacific, and from Vancouver in 1892 over the Canadian Pacific Railway.

Small vessels and boats were active at this time (1887 and 1888), either in the local trade or in fletching (salting) halibut. In British Columbia, the government report states that there were about nine small boats, averaging about $200 apiece in value, and a number of Indian canoes. Most of the fish were caught by Indians and "hawked" locally. Captain Lunberg of Vancouver and Captain Grant of New Westminster fished (1888) in the Georgia Strait (6) and the Strait of Juan de Fuca (5-6) from small boats, but marketed their fish in Seattle. Collins (1892, p. 249) says that in 1888 a small fleet of sloop-rigged boats, manned by about 40 persons, supplied Port Townsend with fresh fish, mostly halibut, as did also certain Indians at Neah Bay. Several small sloops with two men and of 3,000 pounds capacity fished in Puget Sound as far north as Smith Island, and

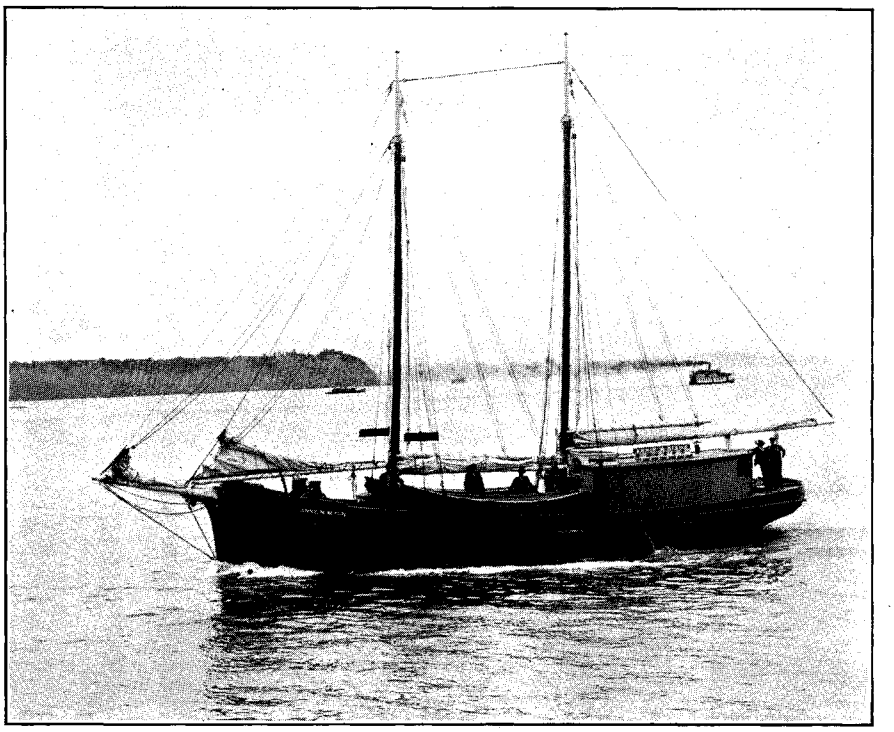

FIGURE 6.—An early auxiliary powered halibut boat, the "Annie M. Nixon," built in 1894.

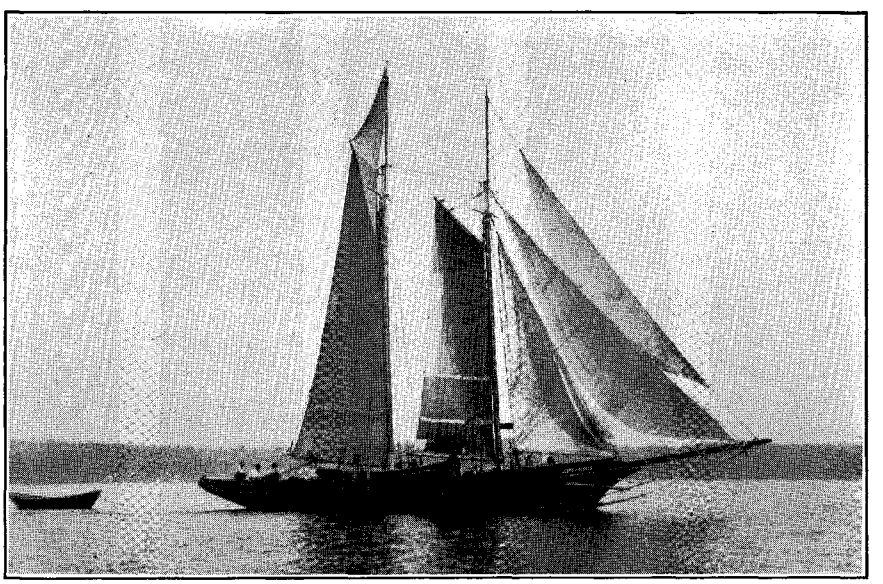

FIGURE 7.—The "Jennie F. Decker" in 1901, showing sails, dories amidships, and lack of cabin.

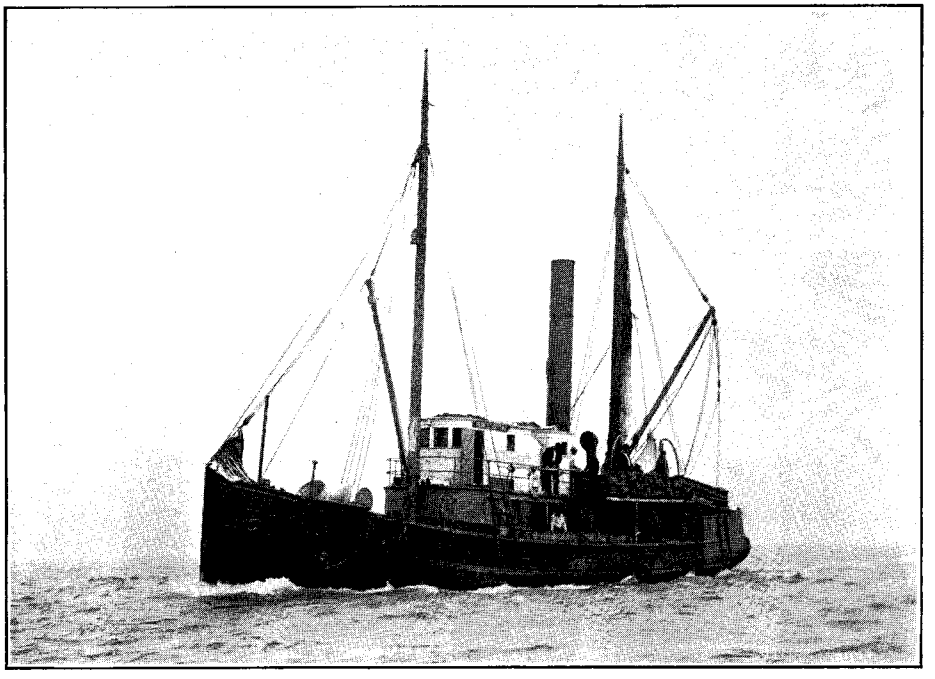

FIGURE 8.—An early steamer, the "Francis Cutting," on which some of the present captains were trained.

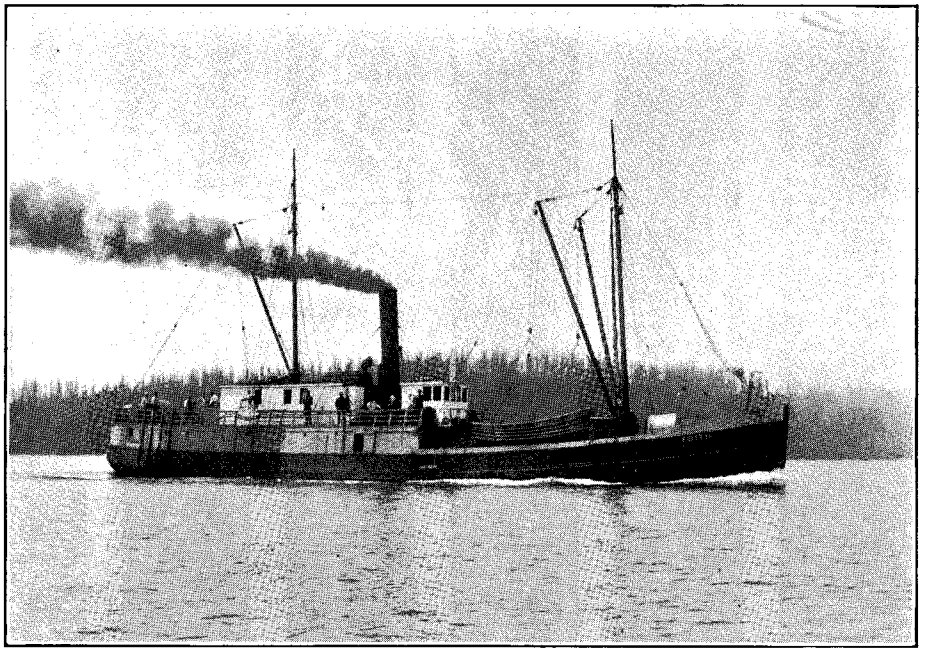

FIGURE 9.—The "Edith" in 1899.

landed in Seattle. A considerable fishery arose at Plumper's Pass, near Victoria, by small boats in 1888. The sloop "Victoria," Captain Nilsen, fished regularly for the fresh fish market in Victoria from 1890 to 1892. Indians and others fished intermittently off Race Rocks near Victoria. David Stephenson, a provincial police officer, brought the sloop "Hesperus," a former sealer, to Nanaimo in 1888 or 1889, her owners being made to stand trial and being convicted of the sale of liquor to the Indians. It appears that the sloop had been engaged in the fletching of halibut at Nahwitti (9), above Alert Bay, purchasing fish from the Indians and, presumably, partly paying for the same in liquor. The "Hesperus" also fished in 1903. The catch was sold in Vancouver. "Alice," a small sloop, three men, fished offshore at Cape Flattery (6), on the Northern Bank, and off Neah Bay, in the winter of 1888 and 1889, selling the fish at Port Townsend. It fished three days for a load, on the same banks frequented by Indians. From the Indians, in this fashion, and by hiring them directly, white men began to learn the locations of the more distant fishing banks, offering, it is said, 50 cents per fish but failing often to pay. But it would appear that the greater part of the catch came from nearby, inside waters, now barren.

RAILROADS

Transportation by railroad has been of primary importance in the development of all western industry, including the halibut fishery. To this transportation the population of the states west of the Mississippi River owes its growth, and upon population depends the market for halibut. To the railroads, also, is due access to the eastern markets. The completion of the Northern Pacific had therefore been looked forward to with great excitement by the small towns of Puget Sound. Great competition arose among Seattle, Olympia and Tacoma for the honor of being a terminus, with the good fortune finally falling to the last named. But it was not until 1887 that the final connection was made with the east, although it had been promised for 1870. In June of 1888 the first coach with vestibules came through. The Canadian Pacific had already reached Vancouver in 1885, and this was one reason for the completion of the Northern Pacific. Six years afterward (1893) the Great Northern entered Everett and built south to Seattle. The completion of north and south roads soon afforded Seattle as good connections with the east as Tacoma, and the Puget Sound fleet of small halibut vessels finally centered there, as the first accessible point. The entry of the Chicago, Milwaukee and St. Paul Railroad, and the gradual growth in efficiency of transportation, with more reasonable rates, followed.

The effect of this development upon the population of Washington is shown by the United States census, giving the total for the state:

Year	Total
1870	23,955
1880	75,116
1890	375,232
1900	518,103
1910	1,141,990
1920	1,356,621

Growth has been similar wherever the railroad has penetrated the West, and with it there has developed the western market for approximately 16 millions of pounds of halibut from Seattle in 1923 (Tariff Commission, 1925).

The details of the growth of the eastern trade from the standpoint of the fleet and the fishermen are of interest, illustrating the manner of origin of what is now a fine fleet of deep-sea fishing vessels.

FIRST EASTERN SHIPMENTS 1888

At the time of the completion of the Northern Pacific the sealing fleet was still a very important one, both at Victoria and other ports. Seattle, for instance, was said to have had six sealing schooners in 1889. Victoria had many more. Captain Sol Jacobs in Gloucester, Massachusetts, owning two schooners, the "Mollie Adams" and the "Edward E. Webster," was attracted through a series of letters in the *Cape Ann Advertiser* in 1886, to the opportunities for carrying on a venture in sealing, supplemented by halibut fishing. He sent his vessels around Cape Horn, accompanied by another, the "Oscar and Hattie"; in 1888 the latter landed from Cape Flattery, the famous halibut shipment, first to go east from Tacoma. This vessel was a typical schooner of Gloucester type, carrying six dories in the waist of the vessel, with fourteen skilled fishermen. She spent her time entirely in the fishing business, but the "Edward E. Webster" landed halibut in 1889, and the "Mollie Adams," at first engaging in sealing, fished in 1888, in addition to activities as sealers. All three of these vessels were sail, of course (Collins, 1892, p. 261).

Despite the great untouched supply of halibut close at hand, it is plain that the halibut fishing by these two famous pioneer vessels was a financial failure. The first trip of the "Oscar and Hattie" was for fletching (salting) at Rose Spit (13), Dixon Entrance, in June of 1888. It is said she set two skates of gear a day from each of six dories, in 30 to 45 fathoms, and carried the fish inshore for cleaning. This procedure contrasts sharply with the modern practice of fishing forty or fifty skates a day from a five-man boat and of remaining on the banks in all weathers. The fletching trip was not profitable, and after trying to fish for the fresh fish market, the vessel was seized for debts in 1889 and went to San Francisco. The "Mollie Adams" entered the fresh fish trade first, making three trips to Swiftsure Bank (6), off Juan de Fuca Strait, fishing three days per trip. She carried eight dories and made two sets of four skates per dory per day. The crew made $75 per man on the first trip, but failed to profit on the next two. Under the impression that the "Oscar and Hattie" was successful in fletching, the "Mollie Adams" went north, as did the former, fishing on the now famous "Two Peaks" Bank (13) in Dixon Entrance. Failing in this, despite a catch of 150,000 pounds, the vessel was sold and became the sealer "E. P. Marvin" out of Victoria. But upon these failures followed other attempts that were more successful, and profiting by the experience gained in shipping their halibut east, the present great trade was built up.

The "C. H. White," a "yacht" built in San Francisco, made repeated trips to Cape Flattery and Hecate Strait in 1889, landing 100,000 pounds in three trips

(Alexander, 1892, pp. 472-74; Collins, 1892, p. 260). She was recorded as fishing in 1892. Other vessels are mentioned, including a steam schooner, the "George H. Chance," which made a trial in 1889 off the Oregon Coast on Heceta Bank (1). In 1890 the vessel landed several trips in Seattle and Portland, but the fish did not sell. The total halibut landed in 1889 was 605,000 pounds in British Columbia, 685,000 in Washington, and 487,250 in Oregon, making a total of 1,777,250 pounds from all sources on the Pacific Coast.

The difficulty these fishermen met in attempting to open the trade with the East was anything but encouraging, if we may judge from the available information (Collins, 1892, p. 264). "Some of the fish, particularly the earliest shipments, reached their destination in good condition and sold at remunerative prices. Other cargoes arrived on an overstocked market and had to be disposed of at rates that gave unprofitable returns, while some shipments were not in good condition when they were received at New York, and proved a total loss to the fishermen." The fish had to be sent to New York when sold fresh, and thence distributed even when destined for the Middle West; and in a similar way the salt fletches were sent to Gloucester. Freight charges were "excessive" ($1.25 per hundred for the first shipment). The claim was made that the eastern dealers had formed a combine against Pacific Coast halibut. Ice was high, being $15 a ton for one trip, and $8 a ton for a later trip of the "Mollie Adams." The "Oscar and Hattie," in 1888, went to Glacier Bay, Icy Strait (18) for ice. There was talk of bringing glacier ice south on a scow from Alaska. Finally, there was difficulty in bringing the sailing vessels beyond Port Townsend, which did not have railroad communication. As many as three days were taken at times to reach Seattle from the Strait. "At the close of 1889 the outlook for the continuance of the Pacific halibut fishery, as an industry of considerable importance, was decidedly unfavorable; indeed there was every prospect that it would be abandoned, or at least reduced to a scale only sufficient to supply the limited local demand" (Collins, 1892, p. 265).

The reaction of the eastern dealers to these fish is interestingly shown in notes from "Looking Backwards," by Samuel Z. Chesebro, published in the *Fishing Gazette* of March, 1924:

". . . . In or about the year 1889, Benjamin & West received from Capt. Sol Jacobs . . . . a carload of West Coast halibut, the first ever to cross the continent. They were packed in all sorts of packages, dry goods boxes, shoe boxes, soap boxes, and possibly some in cigar boxes, for in those days Capt. Jacobs found pretty crude conditions on the West Coast, and had to use whatever packages he could get his hands on. Evidently Jacobs had but little available ice, for the fish came in miserably bad condition, many actually unfit for human food. I am not sure, but think they were caught on the banks off Cape Flattery, though perhaps further north, in the vicinity of Vancouver Island. However, the trade 'dubbed' them as absolutely worthless 'California' halibut, and as I recall, Benjamin & West's gross sales did not equal express charges, notwithstanding the fact that the supply of Eastern halibut was fast diminishing, with a greatly increased demand, and a tendency toward high prices . . . .

"On arrival in Vancouver I found it a crude, undeveloped western town.

Located some fishermen, formerly from Gloucester, Mass. They told me the water was 'alive' with halibut all along the coast, that they had caught some right there in Vancouver harbor. All it needed was a small steamer and fishing equipment. These good fellows volunteered to catch and bring in a few halibut for me. In a small boat, with hooks and lines, they were gone five hours, and returned with ten fish from fifteen to six pounds, dressed weight. Surely they were handsome, plump and hard as iron. They looked mighty good to me."

Meanwhile, the halibut in the Atlantic on the banks accessible to Boston and New York were becoming scarcer and higher priced, reaching what, at those times, was the very high price of 30 cents retail. The first shipment from the West, made from the catch of the "Oscar and Hattie," was followed by others. Larger dealers, with better trade connections, took an interest. Experts were employed to superintend. They improved the handling, the greater volume of trade secured better rates, and what was at first a rather precarious business became of stable importance. It would be interesting to follow this process of commercial organization, but this would take us too far afield.

By 1895 the Gloucester fishermen were complaining of the competition from the West (*Victoria Daily Colonist,* January 20, 1895), the prices obtained for their halibut having fallen greatly. The statistics of subsequent landings on the Pacific Coast tell the story of continuing effectiveness of the western competition.

EXPLOITATION AND DEPLETION OF SOUTHERN GROUNDS

EXPANSION OF GROUNDS, 1888 TO 1910

In studying the further expansion of the grounds fished it is important to realize that this was an economic matter. The extent of the coast over which halibut were found was well known from the very beginning. Cook had found them, in 1778, at the Shumagins (32); La Pérouse at Lituya Bay (19) in 1786; Dixon at Yakutat (20) in 1789; and numerous other observers at various points. The extensive use by Indians from Puget Sound north and west, even along the Aleutians (36), was known before 1888. Bean (1879, pp. 63-66) records halibut at St. Michaels, Bering Sea. Trials had been made along the Oregon Coast (1). Indeed, mention is made of halibut off Cape Mendocino, where there were too many sharks and dogfish for profitable fishing. The first trip shipped to the East came from Cape Flattery, where the Indians had fished from "time immemorial." The "Mollie Adams" and "Oscar and Hattie" had fished halibut for fletching in the vicinity of the Queen Charlottes and as far north as Sitka (17).

The records of the Bureau of Fisheries steamer "Albatross," in 1888, during its exploration of the Pacific banks, show that halibut were fairly abundant along the Aleutian Islands, some being taken occasionally in Bristol Bay. They were recorded by officers of the same vessel as "scattering" around Middleton Island (23), Kodiak Island (27), and the Shumagin group (32). Doubtless they were scattering in comparison to the wealth of fish found to the southward. The cod fishermen recorded halibut from the banks around Kodiak and in Bering Sea.

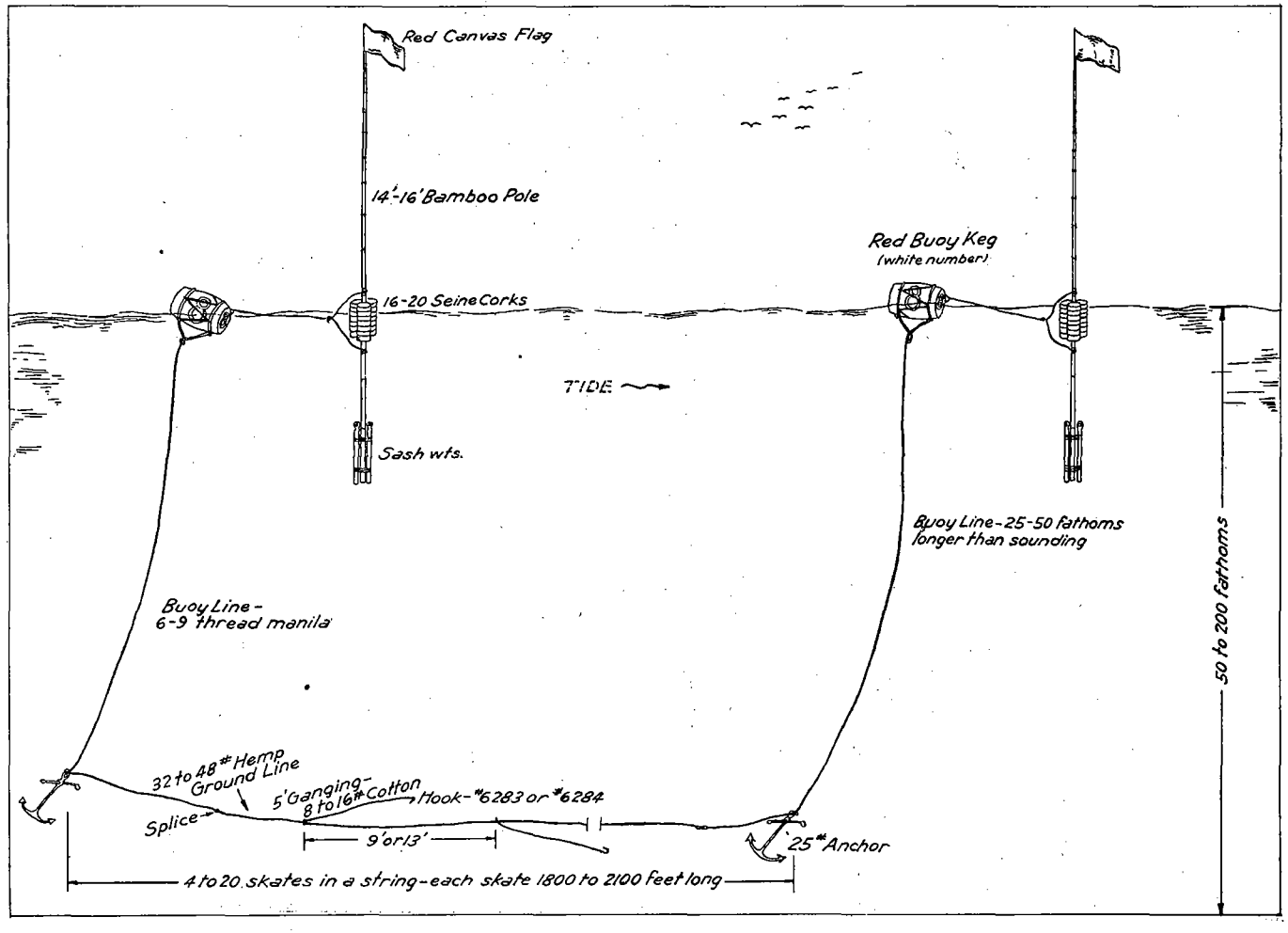

FIGURE 10.—Diagram of halibut gear as set.

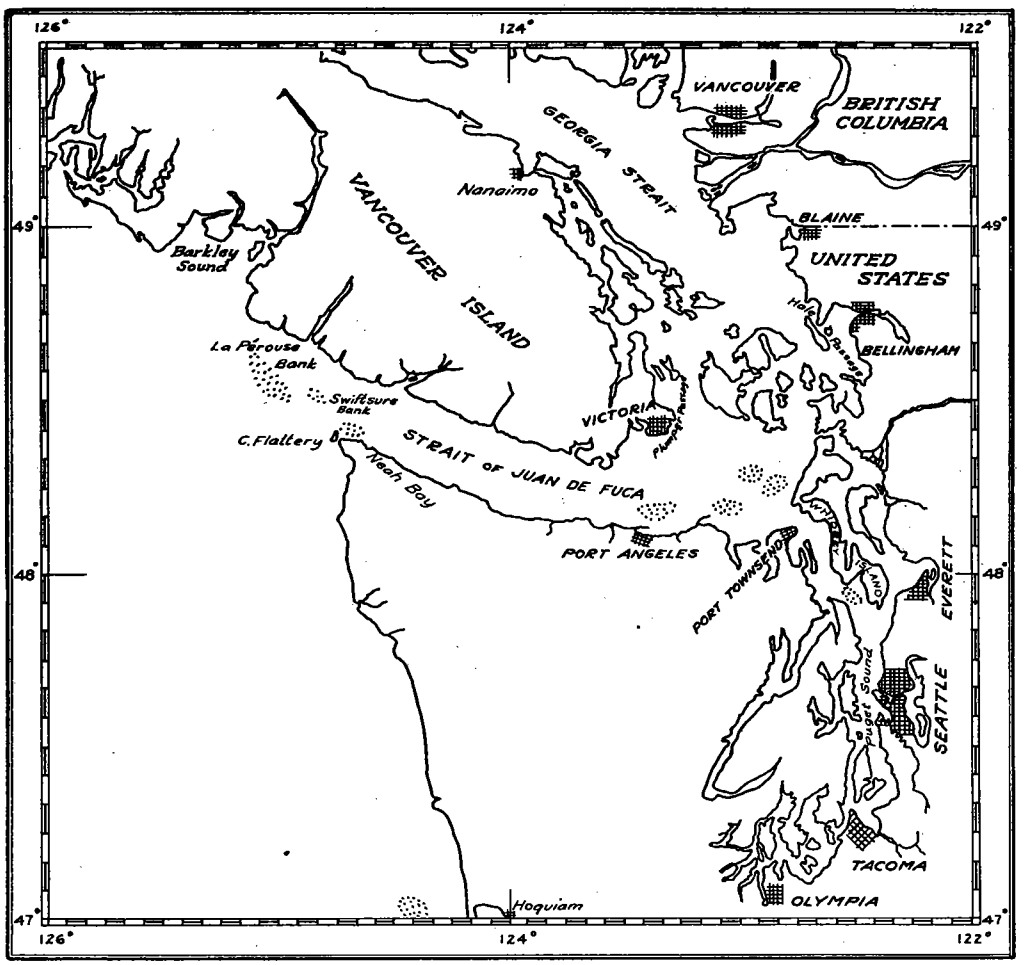

FIGURE 11.—Strait of Juan de Fuca and its connections. Dotted areas are halibut banks.

It would serve no useful purpose to bring together all these scattered references, for every visitor to Alaska from the days of Cook and Vancouver, and every expedition along its coasts, must have seen the halibut and its use by the natives. If any confirmation of the presence of halibut along these coasts was needed, which is doubtful, it was furnished by the cruise of the "Albatross" in 1911,[5] and, in a more convincing manner, by the trial fishing carried on from Kodiak by a commercial firm in 1912. What is evident now should have been evident then, that the limit of the area fished was fixed, not by the presence or absence of halibut, but by the commercial practicability of establishing a paying fishery. The discovery of a bank is not the finding of halibut thereon, it is the actual inauguration of a successful commercial fishery.

The development of the halibut fishery until the year 1910 was one of progressive exploitation of local grounds in more or less sheltered waters. Here, as is true of the deep-sea banks, it was necessary that the fishermen first become acquainted with the particular spots in which halibut were to be found in paying quantities, before intensive use and depletion could occur. It has been said, at one time or another, of practically every section of the grounds now in use, that halibut were not present in commercial quantities. Even the famous grounds at Cape Flattery were said, in the early days, not to yield any great abundance.

In studying these local areas the different sections on the coast may be considered separately, Puget Sound, British Columbia waters, and Southeastern Alaska comprising all that was exploited until about 1910.

PUGET SOUND

Naturally, Puget Sound, closest to the rail communication, was the first frequented by halibut fishermen. Collins, in 1892, gives a map of the location and character of the principal fishing grounds of the State of Washington. He shows, and remarks upon in the text, halibut banks within Puget Sound as far as the south end of Whidbey Island. Others were found at the inner end of the Strait of Juan de Fuca, another off Port Angeles, and finally, there were the famous banks off Cape Flattery (6), corresponding to what is now known as the Swiftsure Bank (see also Jordan, 1887, p. 629). These banks were sufficient to provide a local supply before 1888, there being, for instance, as has been previously said, about forty fishermen landing fresh fish, largely halibut, in Port Townsend. These men had small sloops and rarely went any distance. That halibut were to be found in Georgia Strait in 1889 is indicated by the quotations from Samuel Chesebro. Halibut were reported as taken "at Plumper's Pass" near Victoria in 1888. The Indians of Neah Bay secured their supply from a bank 10 or 15 miles northwest of Cape Flattery. Even as late as 1905 a considerable quantity of large halibut were recorded as being landed at Bellingham from nearby Puget Sound waters near Hale's Pass. At the present very little, if any, is taken from these grounds,

[5]See also the Pilot Chart of the North Pacific Ocean for December, 1905, for table of fishing banks, among which was included a fair table of the distribution of halibut. See also Bean, 1887, pp. 187-226 and 1879, pp. 63-66; Turner, 1886, p. 88; Petroff, 1884, p. 140; McDonald, 1871, pp. 7, 9, 26.

but it is obvious from the early history of the fishery that there were considerable quantities of halibut throughout even such sheltered waters as Puget Sound proper.

It has been said repeatedly that halibut were not to be found on the banks off Cape Flattery except during the summer months. But it is certain that this is not true, for as soon as the proper type of boat was developed, and as soon as there came to be an established market, the Cape Flattery fishery became nearly an all-year one.

The seasons during which the fisheries were carried on from Puget Sound depended rather upon economic factors. It will have been noticed that the first vessels in the major commercial fishery, the "Mollie Adams" and the "Oscar and Hattie," did not fish off Cape Flattery in the winter months. This was also true of the schooners which followed them. They carried five men and two dories, in general, and were too small to fish in the open, their methods of anchoring were not suitable for deep water, and sail was too precarious. The result was that the winter fishery was pursued in the protected channels of Southeastern Alaska, while the Cape Flattery fishery was carried on during the summer months. It is probable that the local needs only were supplied by this summer fishery, as the warmer weather was not deemed suitable for the longer shipments. The winter fishery was possible in Alaska because of the colder weather and the seasonal decrease in landings from the Atlantic. Thus, in 1900, the schooners which made their headquarters at Seattle outfitted in the fall for the Alaska fishery, having spent the summer on the southern banks, particularly Cape Flattery. The first steamer fishing was entirely during the winter, when the great Eastern markets could absorb large catches. It was not until 1900 that these large vessels operated all year.

The earliest vessels of Puget Sound were sail. The large schooners had difficulty in entering the sheltered waters of Puget Sound and of Southeastern Alaska. The smaller sailing schooners had the advantage, so that the type of vessel which was developed up to 1903 to fish the Cape Flattery Bank and those in Southeastern Alaska, was a small vessel of from 5 to 30 or 40 tons, carrying as many as three dories in the waist of the vessel. The need for power was obvious enough so that Captain Jacobs was said to have given some thought to installing steam in the "Mollie Adams." It sometimes took three or four days to get from Port Townsend to Tacoma, and the cost of towing to Seattle was from $100 to $125 (United States Commissioner of Fish and Fisheries, Commissioner's Report, 1888, p. 265).

BRITISH COLUMBIA

From the files of the daily newspapers of Victoria and Vancouver, and from information given us by the late Captain A. Freeman, it is possible to follow the early history of the fishery in British Columbia waters in better detail than in the case of Puget Sound and Alaska. Even in the enormously productive area off the British Columbia coast the first attempts were failures from the financial standpoint, and the dependency of the industry upon market connections is clearly

shown. A summary will be useful, because it will illustrate the evolution of the trade.

This early British Columbia fishery was originated by steamers, aside from a few small sloops, and not by sailing vessels, as in Puget Sound. This was because the banks most accessible to Vancouver were reached through the very narrow and long inside passages between the northern end of Vancouver Island and the mainland.

The first steam vessels to be employed in the halibut fishery in British Columbia were the "Velos" and the "Iona," both first used in freight and passenger service along the southern coast of British Columbia. The "Iona" collected halibut and salmon from the Indians for the Fader Brothers, but in the fall of the year she was chartered by the British Columbia Fishing and Trading Company. This company also had the "Velos," but a sufficient number of fish were not found, and the charter of the latter boat was dropped. What methods were employed are not known, but the fish were probably caught by Indians. In 1892 the "Iona" was outfitted with a 50-foot beam trawl and fished on Nahwitti Bar (9), at the north end of Vancouver Island. The attempt was said to have been fairly successful, despite the fact that the vessel was not well adapted to the purpose. But near the end of the season the vessel was tied up on account of financial difficulties and later was seized by customs officers.

The first vessel to fish for Eastern markets was, presumably, the "Eliza Edwards," which began operations near the end of 1891. Nearly all her fish were shipped East and arrived in good condition. They were caught by Indians in canoes as far north as the Queen Charlotte Islands. Mr. MacKenzie, her captain, went East in an attempt to establish market connections. Nevertheless the vessel fished during the winter season of 1891-1892 only.

Other boats also attempted to open the trade. The steamer "Mischief," chartered by the Port and Winch Company of New Westminster, made one trip, returning in November, 1892, with 12 tons, averaging 60 pounds per fish. The "Coquitlam" was operated off Banks Island (12) by the Fader Brothers early in 1893, and later by the Port and Winch Company.

The first successful attempt, from which the final permanent fishery developed was a shore fishery. In November of 1893 the "Capilano," a small freighter owned by the Union Steamship Company, was chartered by a Westminster company and was taken by Captain Freeman to Porcher Island (12), near Freeman's Pass, in Hecate Strait. Lumber was taken to build a house, salt herring were secured for bait, ice was obtained from Port Hamlin, up the Fraser River, at $15 to $20 a ton, and five round-bottomed "Columbia River" boats were taken for the ten fishermen. A combined fish and "bunk" house was erected within two days after arrival. The steamer was anchored in the harbor, and the fishermen went out every day in their boats to fish. The first cargo taken south totalled about 20,000 pounds, and the fishermen were left behind to catch another. This they preserved in ice obtained from the lakes near by. As the hold of the steamer was not penned off to prevent shifting of the cargo, the halibut was placed in boxes for stowing. It was shipped from New Westminster to New York, with the exception

of some which was sold locally. The total taken during the season was about 200,000 pounds, averaging about 35 or 40 pounds to the fish, and operations stopped in March of 1894.

The essential step from a shore to a high seas fishery was the proper handling of the boats, and the change was soon made. The small boats, about twelve in number, were at first confined to fishing near the shore and near harbor, on account of bad weather. The charter of the steamer prevented it going out to take in the fish, and as a consequence, a scow was obtained from which operations were conducted from the west side of Banks Island (12) for the last part of the season. Due to the fact that intensive fishing near the harbors exhausted the banks, it was thought that a greater amount could be obtained by changing the method of procedure in order to tow the boats to new banks and to accommodate the men aboard in case they could not be towed back to camp. Accordingly, in the fall of 1894, the steamers had the right, under their charters, to assist the boats, by towing them, etc., and the early months of the year 1895 saw the first use of dories, which were more convenient and could be carried aboard the vessel in "nests," as they were in the Eastern high seas fisheries.

The attempt flourished. In the fall of 1894 the "Capilano" was operated in the same locality as during the first season, but by the New England Fish Company, with the addition of more boats and a larger scow with fish-house and mess-house. Another company, the American Fishing Company, chartered from the Union Steamship Company the steamer "Coquitlam," a vessel similar to the "Capilano," and towed an old stern-wheel steamer, the "Delaware," as headquarters for six large boats, to a station near that of the "Capilano." The Victoria Fishing and Trading Company operated the steamer "Thistle" with a barge and 13 small boats at Goshen Harbor (12). Her fish were sold in Vancouver, but after the first four trips were landed in Tacoma and Seattle for shipment east.

Thus there had now been some five or six companies to engage in the halibut trade. But all of them had financial trouble except the New England Fish Company, which was an association of Boston fish dealers who controlled the halibut markets. All halibut had, at that time, to be shipped to Boston for distribution through the dealers there. The New England Fish Company or its subsidiaries, therefore came to be the only company operating steamers from British Columbia ports.

During the fall of 1895, the New England Fish Company chartered both the "Capilano" and the "Coquitlam." The two steamers then alternated in the care of the fishermen and in carrying the fish to Vancouver. The boats were towed to the grounds and tended by one vessel, allowing a trip to be landed in Vancouver once a week by the other. The season's catch of these two steamers aggregated 900,000 pounds, 750,000 of which were sent East. The "Thistle" was chartered by the New England Fish Company in the fall of 1895.

With the coming of a steamer—the "New England"—specially built for the business, the fishery ceased to be strictly a shore fishery, although it continued in the same general region for two years. The steamers previously used were no

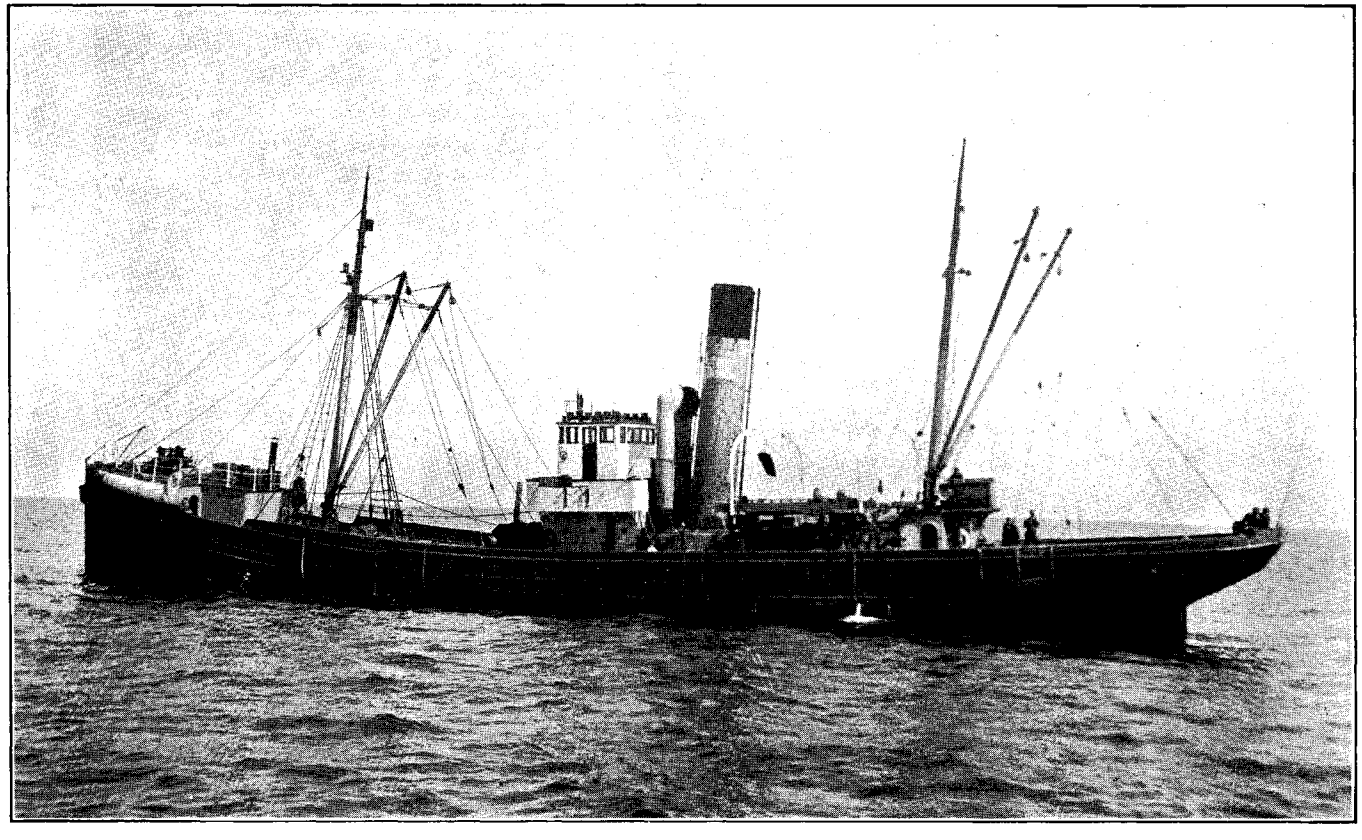

FIGURE 12.—The "Roman," 1915. Her dories are "on the gear" and their place on the stern is vacant.

FIGURE 13.—A bucket of fish from the hold. The latter is divided by bulwarks to prevent the shifting of crushed ice and fish. Photo by Ernest Pegler.

FIGURE 14.—A deck load of halibut in the early days. Photograph by Webster and Stevens.

longer chartered, because unsuited. All operations were now carried on from the steamer, which carried twelve dories nested on the stern, and was much more efficient and convenient. She arrived too late for the fishing in the spring of 1898, and was occupied during the summer in towing a barge to Nome during the Alaskan gold rush. Another steamer, the "Edith," was similarly equipped in October of 1898, by a Tacoma firm, with eight or nine dories, and as the years went on, many other vessels engaged in the fishery.

The success of these ventures was conditioned rather by the market developed than by the supply of fish to be had. Fish were very abundant, and it was possible to load a vessel in a few days' fishing. If this had not been true, the venture could not have succeeded, for the methods of handling the catch and the dories were cumbersome and slow. At this time (and until 1909) skates of 10 lines, each 50 fathoms in length, were used, and a catch of 1000 pounds to the skate was not considered fully satisfactory fishing, causing a move to new grounds. This catch was, roughly, some 16 times as great for the gear run as is obtained at present, as we shall see later.

At first the steamer fishing was entirely during the winter months, when the catch in the East was small and when prices were best, not at all because the fish were then most abundant. As the Western halibut became better known and more firmly established in the Eastern markets, the winter fishery extended into the summer, at first under a limit as to amount per trip, later without limit. In the fall of 1899 the "New England" commenced somewhat earlier in the season, about the first of September, but was placed under a limit of 75,000 pounds per trip, or as much as the New England Fishing Company could profitably handle. After November the limit was taken off until March, and under it, the vessel operated until the middle of April. From the fall of 1900, the "New England" continued to fish throughout the year, with a limit of from 50 to 75 thousands of pounds per trip from May until September. The increase of the fishery reflected the growth of the market, not the abundance of fish, which was more than sufficient.

This fishery, unlike that of Puget Sound, was principally carried on by steamers, because the inland passages favored the powered vessels, allowing of trips of great regularity, averaging for years between five and eight days per trip. The size of the vessels and the number of men employed on each was large, and as a result, these steamers were always so-called "company" boats, owned by the larger fish dealers such as the New England Fish Company. The increase in the steamer fleet which followed is dealt with in detail elsewhere, but from 1904 to 1905 fishing in Hecate Strait seemed to be at its peak, several more boats having entered the field. As is shown, their numbers increased from 1 in 1889, to 6 in 1906, to 11 in 1909, and to 13 in 1911. Meanwhile the schooners had undergone a transition to power, and with the passing of the years, greater numbers of them came to frequent Hecate Strait, greatly intensifying the fishery.

This increasing fleet fished a constantly widening extent of ground. With the adoption of dories, the inauguration of fishing from the vessels, and the bettering of methods of handling the fish, more gear was run and deeper water was tried. When the "New England" arrived, fishing was still done in the vicinity of Banks Island, but was soon over a much wider area. The "Edith" fished, for

the most part, off Dundas Island (13), whereas the "New England" fished off Butterworth Rocks (13), Rose Spit (13), and Banks Island (12). After the first three years the exploited grounds covered an area 50 miles long by four wide, between Rose Spit and Banks Island. Section after section of Hecate Strait was placed under contribution. Some of the best fishing grounds began to show a decline both in the quantity and size of the fish taken. Those banks in the vicinity of Cape Scott (9) were utilized as early as 1888, those at the west end of Banks Island from 1892 on, those at Rose Spit from 1895. The Goose Island Bank (9-10), lying between the northwest end of Vancouver Island and the southerly end of the Queen Charlottes, was discovered in 1903. For seven or eight years there was an abundance of fine fish from them, and even in a depleted condition they still continue to yield more heavily than other banks off the British Columbia coast. So that, as far as Hecate Strait was concerned, exploitation was extended piecemeal as the increasing fleet needed new grounds (See Joyce, 1913, for detail).

ALASKA

Rapid transportation through the inside passage between the landing ports of Vancouver and Seattle and the abundant fishing grounds in British Columbia and Alaska was not possible for the sailing schooner. The first exploitation of Alaskan waters was therefore carried on by small schooners whose catches were shipped south on the regular freight steamers.

Whereas in British Columbia it was the fishing steamer which solved the question of handling and transporting the catch, in Alaska facilities for these two purposes developed independently. The fishery in Alaska, although it had begun as early as 1895, did not amount to a great deal until 1899, when a cannery and wharf were built at Petersburg (16), and regular calls by the steamers were arranged for. Without such regular calls it was nearly impossible for fresh halibut to be shipped south. From that time until 1910 the business of shipping boxed halibut was more and more concentrated at Petersburg. The system of establishing shore stations from which the fishermen operated in dories also found a place here. Collecting stations were established at a number of convenient points, from which the small steamers of the dealers collected the fish and brought it to ports of call of the large freight vessels. All the fish produced was shipped to Seattle in boxes of 500 pounds net weight. The ice used was taken from the glaciers and brought to the scows at Petersburg, Scow Bay, or other ports of call.

The same impression of piecemeal exploitation of the banks in the inside waters of Alaska is given as prevailed in British Columbia. The fishermen extended their knowledge year by year as the necessity for new banks arose. The first opinion was that the available supply of halibut was not great. In 1898 (pp. 258-260) Rathbun of the Bureau of Fisheries could write that the catch in Southeastern Alaska was small, that the principal catches were to be taken in southern waters. He believed that the banks were not extensive enough to compete with those in the East, and said that the fishery on the Pacific was mainly in the winter, when the Eastern fishery was at a low ebb. Moser (1899, pp. 45-48)

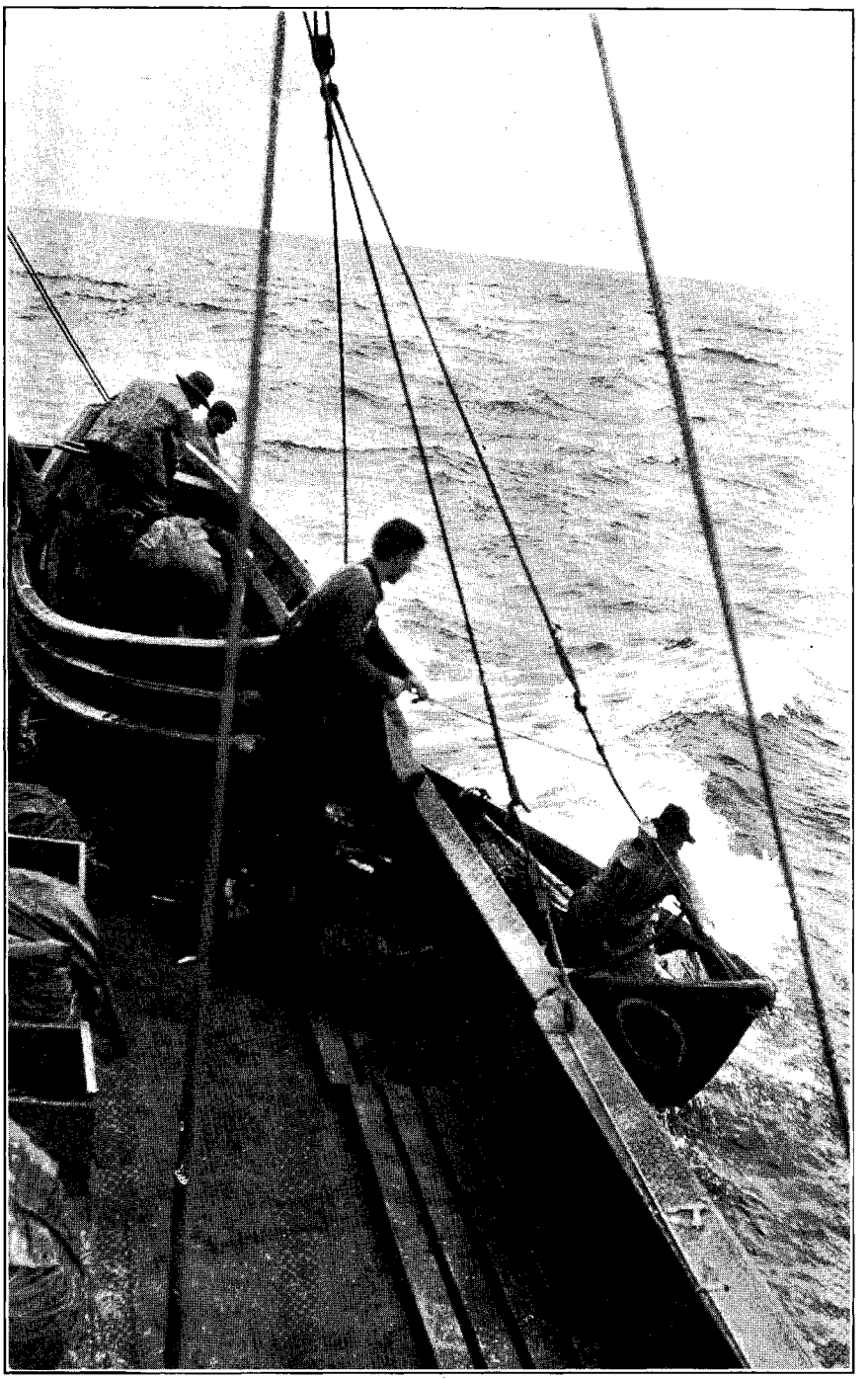

FIGURE 15.—Putting the dories overboard from a steamer at half-speed.

FIGURE 16.—A dory at work. The line is taken in over the gurdy, the fish thrown in the landing net, and the gear coiled in front of the standing fisherman.

stated that there was no prospect of a large commercial fishery in Alaska. The same writer, in 1901, repeats this opinion. The reports of the United States Bureau of Fisheries record for 1903 that the Alaskan fishery did not seem to be considerable, and that the halibut banks were principally in British Columbia waters, in Dixon Entrance, and off Cape Muzon (14) and Cape Chacon (14). This may have been true as far as the inshore fishery was concerned, just as it was of British Columbia, but as will be seen, there were greater banks offshore awaiting discovery.

Nevertheless even the inshore fleet showed growth in size. In 1901 there was an Alaskan fleet of 20 small schooners and sloops, 12 of which had two dories, and 8 had one, the total number of fishermen being 84. They landed their fish at Petersburg (16). Also in Icy Strait (18) a salmon cannery, during the slack season, used two steamers of 34 and 18 tons in the halibut fishery. These vessels carried four and three dories, respectively, with 22 men all told. They produced 350,000 pounds, which were shipped fresh to Seattle and sold at 3 cents per pound. None of these vessels were capable of fishing offshore, and they exploited grounds in the straits and sounds, learning more and more about the location of the best spots. Finally, in 1910, the steamer fleet began to use Alaskan waters. So, in 1910, the statistics of fish carried through Alaska show a remarkable increase. It is said that from 1907 to 1911 there was very good steamer fishing in Stephens Passage (17), and that fishing was good in Chatham and Icy Straits (17). No fishing was carried on in outside waters north of Coronation Island (15), south of Sitka. The fishery was carried on only when financial returns were largest because of high prices in the East, and demand good because of the winter scarcity there, and because of the rough weather off Cape Flattery.

The establishment of a new cold storage plant in 1909 at Ketchikan (14) by the New England Fish Company gave a new impetus to the Alaskan fleet of small boats, for they were enabled to fish throughout the year, their summer fish being frozen. Moreover, the fleet which came north from Puget Sound for winter fishing had been hitherto the most important, but now a number of small vessels were built for use in Southeastern Alaska, and more and more of the Puget Sound fleet remained there.

DEPLETION

Up to the year 1909 or 1910 the process of development in all sections of the coast had been that of the gradual development of a knowledge of the local banks, their successive exploitation, and in each case, the development of a suitable and characteristic fishing fleet. But at the same time there had been going on another process, that of depletion. The fish in protected waters were becoming scarcer and scarcer. They had largely disappeared from Puget Sound. The famous fishing banks such as Rose Spit (13) and Hecate Strait (11-13) were so completely cleaned of halibut that it did not pay to frequent them as formerly, especially in the larger vessels. The steamer "New England" alone landed 1,600,000 pounds of halibut during six months of the season 1898-99.

This process of depletion may be described as follows. From 1904 to 1905 fishing seemed to be at its peak, several more boats having entered the field. Some of the best fishing grounds began to show a decline, both in quantity and size. Whenever a new spot was discovered, there would be a considerable number of gray (discolored) and poor fish caught. In some places the percentage was as high as 10. After a short period of fishing on these grounds, there would be scarcely any gray left, and a much smaller average size would be obtained; until, at some places, the fish, while fairly plentiful, would be so small that they were not worth fishing for. At this particular time there was no market for these small fish. This went on for four or five years before the catches lessened very much, but the trips got longer, more gear, bait and ice were required, and the number of fishing days per trip increased.

This depletion was reflected in official reports. From 1900 on, the question of poaching by American vessels had engaged the attention of Canadian authorities because of the belief that Canadian waters were being exploited, and that they should be reserved for Canadian citizens. The Canadian Government Reports state repeatedly that halibut were becoming scarce in Hecate Strait, that in 1909 and 1910 the fishermen had practically deserted the mainland harbors and now frequented the north end of the Queen Charlotte Islands (13), and the banks between Skidegate (12), and Cape St. James (11). For the first time they were reported working along the West Coast of Vancouver Island. The Report of the Bureau of Fisheries for 1912 says that it is recognized that the banks were becoming depleted. Captain Joyce (1913) believed that the shoaler banks were exhausted. These were, however, isolated statements without proof or exact information.

In 1915, the Report of the British Columbia Department of Fisheries published the results of an investigation[6] upon the statistics of the halibut fishery, based upon the catches of five halibut steamers operating out of Vancouver and within British Columbia waters. From the logs of these vessels it was possible to obtain the amount of gear fished each day, the locality, and the catch obtained. There was shown to be a shift in the fishing grounds in 1910, for deeper waters were being resorted to, and the banks on the outer coast were being used for the first time. The rate of decline in abundance was shown to be such that the formerly productive banks were losing 75 per cent of their fish each decade. This decline was reflected in the length of voyages, in the fishing time, in the decline in average size of the fish, and the decreased size of the cargoes. The impoverishment of the banks was evident in every phase of the fishery. There could be no denial of the seriousness of the situation.

This report, the first serious scientific work upon the banks of the Pacific Coast, will be dealt with in detail later, in connection with the scientific phases of the present reports. The latter are, in fact, a continuation of the work then begun.

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[6]W. F. Thompson, Statistics of the Halibut Fishery in the Pacific, 1915. Reports British Columbia Commissioner of Fisheries for 1915 (1916), pp. 65-126. Mr. J. P. Babcock, Chairman of the International Fisheries Commission, was then directing the work of the department.

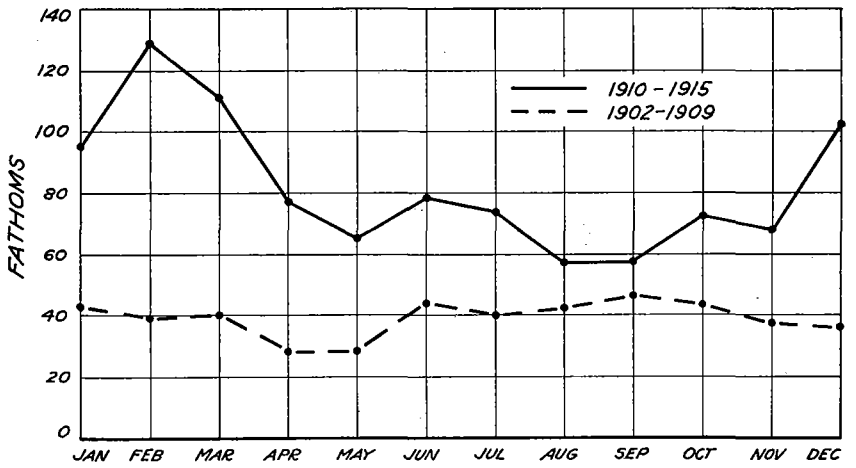

FIGURE 17.—Monthly average of depths in which steamer fishing has been carried on off the British Columbia coast, before and after 1910. To show greater increase in winter. (From data by Thompson, 1916).

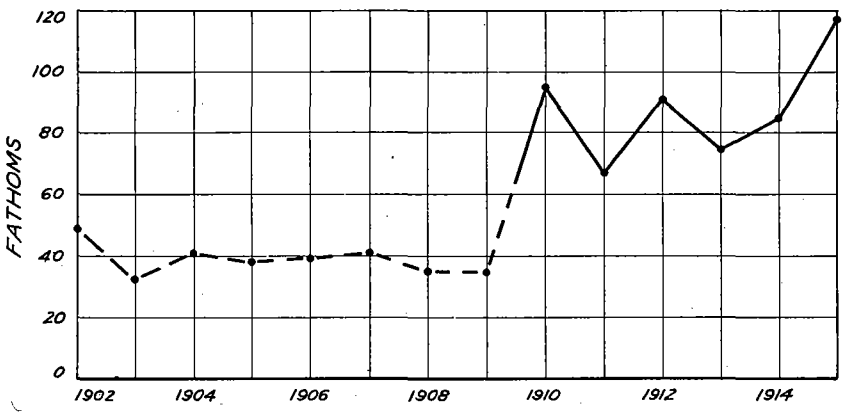

FIGURE 18.—Annual average of depths in which steamer fishing has been carried on along the British Columbia coast. To show great increase in 1910. (From data by Thompson, 1916).

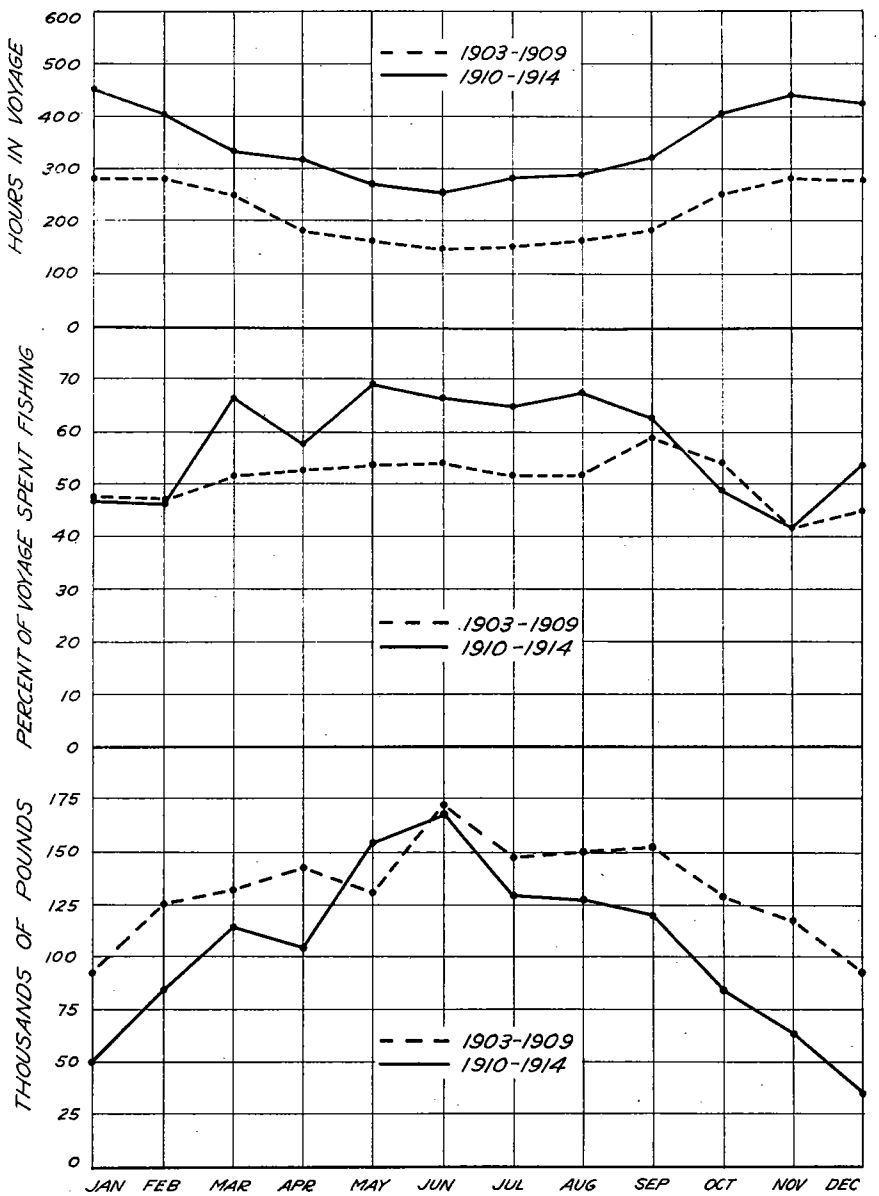

FIGURE 19.—Analysis of steamer voyages off the British Columbia coast before and after 1910, to show effect of depletion in lengthening voyage, decreasing catch and increasing effort.

A. Monthly average of hours per voyage.
B. Percentages of voyage time spent in fishing.
C. Monthly average size of cargoes landed. Compare with A.
(Data by Thompson, 1916).

EXPANSION TO DEEPER AND TO MORE NORTHERN WATERS

MECHANICAL EVOLUTION OF FLEET

But the mechanical evolution of the fleet more than counterbalanced the depletion. This evolution is of extreme interest, as it is still actively under way and promises to dominate the future as it has the past of the fishery. Improved methods and greater efficiency have made the fishing continually profitable despite the great fall in returns per unit of gear. With the use of better vessels the grounds have been extended into deeper, more distant, and less protected waters. This ability of the fleet to reach new banks and to tap new sources of supply, plays a greater part in the maintenance of the total yield than does the increased efficiency, as can be shown by the statistics of the present yield of different sections of the banks. These things have, for the time being, saved the fishery as a whole from inevitable decline, avoiding the economic consequences of lessened abundance. But what is happening should be thoroughly understood, even though the process of evolution continues during the coming years, for there is probably a limit both to increased efficiency and the banks to be tapped.

The continuous changes in efficiency and in methods have been obvious from the very start of the fishery. Something of those which occurred in the steamer fishery has already been touched upon in discussing the exploitation of British Columbia waters. We are indebted to the late Captain Freeman for further notes upon these changes as far as methods and gear are concerned.

As has been said, the first fishing in Hecate Strait in 1892 was done from the shore in round-bottomed Columbia River boats. These could not be stacked, as can dories, and the result was that they were suitable only when the boats could be towed back to harbor. The adoption of dories was therefore the first step toward the greater efficiency of the vessels, a step that was taken in 1895, soon after the start.

However, when the dories made the steamer their headquarters, it was necessary to handle their fish quickly, and this was a very important matter, since the dories were filled repeatedly during a day's work. To take the fish aboard, a very cumbersome method was used. It consisted of hoisting five fish at a time by means of small straps around the tail of each fish. This allowed on an average of ten fish to a minute to be handled, so that sometimes when a dory had 70 or 80 fish it would require nearly 10 minutes to unload, depending upon the men and the weather. The second year two other methods were tried, to both of which the men objected strongly. One of these was to place five hooks on short lines attached to a ring, but the lines became snarled and the hooks were dangerous, while the method was but little faster than the lines. The other method was to use a hoop net with a diameter of two or three feet, into which the fish could be thrown. This was hard to use when the weather was rough, so the fishermen refused to adopt it and went back to the straps. By that means only one set of three skates of gear a day could be run, when fish were as abundant as they were.

In 1901 or 1902 the use of slings was introduced, the fish being strung on a rope through the gills, five at a time, the end of the rope being passed through an eye in its other end and then passed aboard. This speeded up the unloading

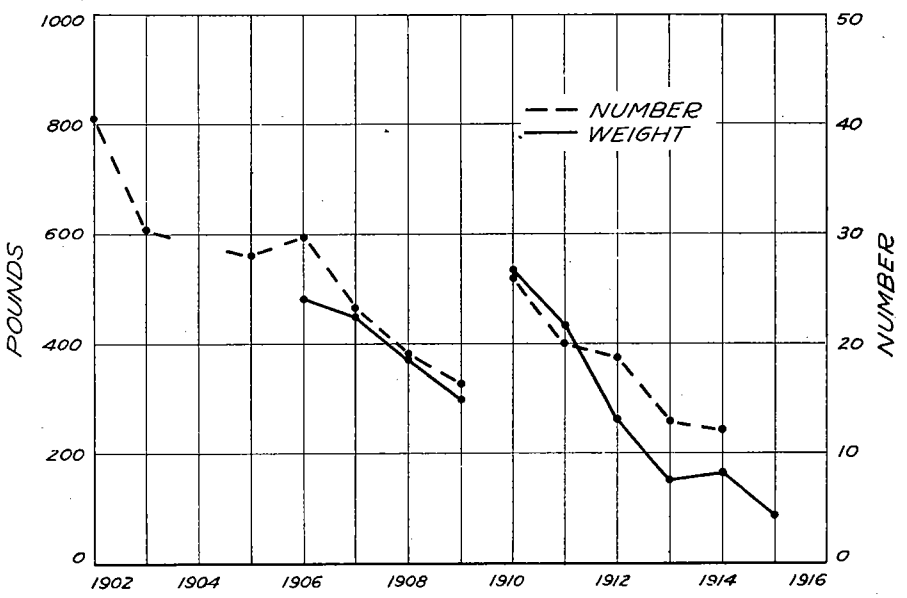

FIGURE 20.—Decline in catch of halibut per unit of gear, corrected for changes in length. To show depletion of inshore banks before 1910 and of offshore after 1910, on the British Columbia coast. (Data from Thompson, 1916).

a great deal, since the men could prepare the fish for unloading while waiting for the steamer. Occasionally strings of fish were floated in the water astern of the dory when there was no room inside. But in 1902, Captain Joyce of the new steamer "Kingfisher" introduced the use of landing nets, whereby the fish were thrown into a net spread in the bottom of the dory and lifted on board by the vessel's winch, much as baggage is handled on a passenger steamer today. As a result, handling of the fish was greatly expedited and more gear could be run per day. *It was possible to catch and handle twice as many fish in a day.* This is, of course, but one example of the increasing efficiency of the men and their methods, which later enabled them to fish under more difficult conditions, and it illustrates the seemingly minor mechanical things a great fishery depends upon.

A more important development was in the use of power. The small schooners had found themselves handicapped without the use of power both for safety and for reaching the banks more expeditiously, and as a result, the use of power became general. In 1895 a gasoline-driven vessel, the "Morro," had operated out of Victoria (6), (Wright, 1895, pp. 420-21). Auxiliary engines of 25 and 30 horse-power were installed in the fleet beginning about 1903, and all new vessels were powered from then on. With the addition of auxiliary engines it became possible to use larger vessels. And it became possible for the schooners to share in the heavier yields which came from Hecate Strait (11-13), or off Cape Scott (9), banks tapped previously only by the steamers. The "Northland," built in 1905, was said to be the first schooner successful in depending primarily upon power. But the *Pacific Fisherman* records that in 1903, the "J. F. Conner" installed an auxiliary engine, that in 1905 eight vessels had done so, in 1906 ten, and in 1910 all but three of the Puget Sound fleet were using power. The last to install an auxiliary gas engine was the schooner "Shamrock."

A foundation of mechanical development had been laid for the future expansion which lay before the fleet.

IMPROVEMENT OF MEANS OF PRESERVATION

Hardly less important to the expansion of the fisheries has been the development of cold storage and the manufacture of ice, used both on shipboard and en route to the consumer. Distant trips were impossible without ice from the very beginning, and cold storage has been a stabilizing influence, caring for seasonal surpluses and for trips which must be landed far from railroad terminals. And even in the case of fisheries selling their product in markets much closer to the landing port than is the case with the halibut, ice during railroad carriage is indispensable. The halibut industry is built upon the use of ice and cold storage, and this is more true at present than at any time in the past, because the distances over which the fish are carried are greater, and the markets more diverse. It is entirely probable that the future expansion of the grounds will await not merely transportation changes but improvements in cold storage facilities or methods.

To understand the importance of cold storage and ice to the halibut fleet,

some idea of the use of ice is essential. Upon leaving port, the hold of a vessel is nearly full of crushed ice in which the halibut catch is to be preserved. This melts slowly, but upon the longer trips the amount of ice may be insufficient, so that at present the best of the larger boats have cork-insulated holds. Certain of them have installed small refrigerator units to keep the ice, but whatever the future of these machines, they have thus far proved no substitute for ice. Fishermen insist that the fish do not keep better when the ice is too cold and hard, a certain amount of melting being necessary. The ice is placed within the "poke" or body cavity after the fish are cleaned, and the whole fish is laid in ice, tier after tier, within the divisions of the fish hold made by "pen boards." A plentiful supply of ice has always been indispensable.

At the time of the completion of the transcontinental railroads and the start of the halibut industry, crushed ice was already in use on the Eastern coast. Attempts had been made before 1870 to ship halibut to San Francisco from the north in pounded ice, with excellent results as far as the fish were concerned, but without financial success. Where this ice came from we have not been able to find out, but during the years following 1888 the glacier ice of Alaska was used to ship boxed fish from Petersburg (16) and other Alaskan towns. Perhaps the shipping points were chosen because of the supply of ice available. As early as 1902 a cold storage plant was said to have been built at Taku (17), but the use of glacier ice continued at least until after 1907. In 1923 glacier ice was still furnished at Wrangell (15).

Captain Freeman stated that, in the early days of the fishery in British Columbia, ice used to be brought down from the interior, or from Bellingham Bay, Washington, there being no ice plant in Vancouver until about 1896. In fact, snow was often used, it being at times brought down by the railroad from the interior. The "Capilano" used snow after her first trip, and her crew would obtain snow in the inlets, as the fishery was then during the winter. The fishermen preferred ice, however, as the snow was too "dry" and would absorb the juices of the fish.

At present crushed ice is provided at almost all ports in Alaska where halibut is bought, and is delivered conveniently and without labor through chutes directly into the hold. As a result its use is universal. It is a vital necessity, not only to the fleet, but to the dealers who ship their purchases to market after repacking in crushed ice.

But the cold storage plant has several important functions other than those of making ice. Vessels ordinarily take enough frozen bait—or fresh bait preserved on ice—fuel, and ice, for a voyage of ordinary length. It may often happen, however, that fishing is unsuccessful, and that at the end of two weeks or so, the amount of fish in the hold is too little to pay the expenses of running to the main landing ports. The fish on hand is by that time getting old, and cannot be kept longer unless the vessel starts back immediately. Either the fish must be disposed of or the trip must be a loss. Under such circumstances the distantly located cold storages, such as that at Seward, play an important part in enabling the vessel to save this fish and at the same time re-outfit and re-fuel. Indeed, it

may not be too much to say that the exploitation of the more distant banks would be at a higher cost if such service were not given in the case of broken trips.

But a far more important function of the cold storage plant is the care of surplus landings. At times when prices are low and the supply of fish plentiful, dealers buy for freezing. The frozen fish is disposed of when fresh fish is not on the market, or at least that was at one time the case, for improved freezing methods have produced a better grade of goods in recent years, and will undoubtedly finally overcome the prejudice against frozen fish. The net result of the freezing of fish is the steadying of prices, and the disposal of temporary surplus supplies, whatever advantages it may have otherwise.

A third very great service performed by these plants is the freezing of bait herring. Fresh herring are still preferred by fishermen. But these are highly seasonal and erratic in occurrence, and are not always available, so that a very great quantity of frozen bait is used. The herring are seined during the seasonal runs, and are frozen in pans, making square cakes.

The cold storage plant has therefore played an important part in the exploitation of the banks and has developed with their expansion, but has cared for other species, notably salmon, at the same time, and no clear-cut correlation can be expected. The first frozen fish—steelheads—were shipped East in 1894. The first cold storage plant was built on Puget Sound in 1892, and by 1903 four were operating. In 1905 there were a number of large plants on the Canadian side. There is little definite data upon their production, however, to be found in the literature until the rapidly growing industry had reached its near maturity in 1911. At that time the *Pacific Fisherman* began the annual collection of figures on frozen halibut and other species.

The cold storage plant built at Ketchikan (14) in 1909 is an illustration of the importance of such facilities to the halibut fleet. It provided a base of operations and resulted in the building of a number of small schooners with auxiliary power for the exploitation of the enclosed sounds and channels of Alaska. It allowed them to fish throughout the year. It also aided directly in the expansion of the Alaska fisheries by the larger boats. The plant at Kildonan, Barkley Sound (6), built in 1911, played a similar role.

SHIFT TO DEEP-SEA FISHERY IN 1910

The year 1910 is from many standpoints an important one in the history of the halibut fishery. In a sense it was the birth year of a real deep-sea fishery. The expansion of the fishery from then on was into new and more distant areas, for the fleet had developed mechanically and had begun to add to its numbers the larger, more able vessels which are more properly termed deep-sea. This year saw the area of exploited southern banks at its maximum. At that time it was possible to fix with a considerable degree of precision the extent to which the banks had been exploited, and in 1910 and 1911 are to be found the first statistics as to the total landings for the entire coast. It has therefore been possible to use this year as a basis for comparison with present conditions on the older banks.

Both Canadian and United States reports show this notable change in the fishery, recording discovery of new banks from the Queen Charlottes to Cape Ommaney (16). Thus in the Report of the United States Fish Commission for 1910 (p. 51) the discovery of new banks off the northwest end of the Queen Charlottes is recorded. The banks to the north of these, off Forrester Island (14), and off Sitka (17), were prospected by the steamer "Grant" in the winter of 1909 and 1910, yielding an abundance of halibut of 14 and 15 pounds average weight (Marsh and Cobb, 1911, pp. 40-45) and Captain Crocket. Good fares had been taken 25 miles southwest of Coronation Island (15), also from a bank 40 miles south of Cape Ommaney (16) (Alexander, 1913, pp. 14, 42). It is said that the "Chicago," a steamer, fished as far as Cape Ommaney in 1911. And in that same year, for the first time, reference is made to vessels fishing "in recent years" beyond the mouth of Icy Strait in the vicinity of Cape Spencer (18), but to no considerable degree. Also, that "scattering halibut are caught near Sitka at all seasons, but no banks of commercial importance have been reported or found in the near vicinity." The first grounds mentioned as of commercial importance are those off the Coronation Islands (15) (Alexander, 1913, pp. 42, 45).

This change in the fishery is not clearly recognized in the literature but the condition of affairs is indicated by more than such general statements, being borne out by the report of W. F. Thompson for the British Columbia Fisheries Commission (1916). This was made from an examination of the catches of steamers fishing in British Columbia waters. They show a shift to deeper waters within British Columbia banks, and a falling off in the abundance as shown by the catch per skate. So, too, the great increase in the fish credited to Alaska is evidence of this shift (p. 108).

Therefore, in the reports of the various governments and in the columns of the *Pacific Fisherman,* there is sufficient evidence to indicate unmistakably that, in the year 1910, there occurred a significant change in the fishery to outer and deeper banks, and that, in 1911 and up to 1912, there was no fishing to any extent in outside waters beyond Cape Ommaney. This was because the larger schooners were just building, for at that time the steamers were securing a sufficient abundance in Southeastern Alaska and off British Columbia.

A NEW FLEET

The types of new boats indicated a consciousness that from this time on, the future of the halibut fishery lay on the northerly offshore banks. Vessels were built which relegated sails to the position of auxiliary power, as for instance, the "Montana," built in 1911, and the "Knickerbocker," built in 1913. Others equally large and able were launched about that time. A considerable number of gasoline engines had been developed of fine type, and the use of distillate was greatly increased. The engines were more dependable, cheaper to operate, and the men were trained to their use. So the vessels lost their sailing lines and were built more on the power-boat type, with a pilot house, and carrying dories aft rather than in the waist. In 1912 appeared the "America," the first of the halibut vessels

FIGURE 21.—Halibut vessel of older type, showing anchor cable. In foreground one of early chutes for setting gear. Seattle, 1915. Contrast with "Marmot" and "Pioneer."

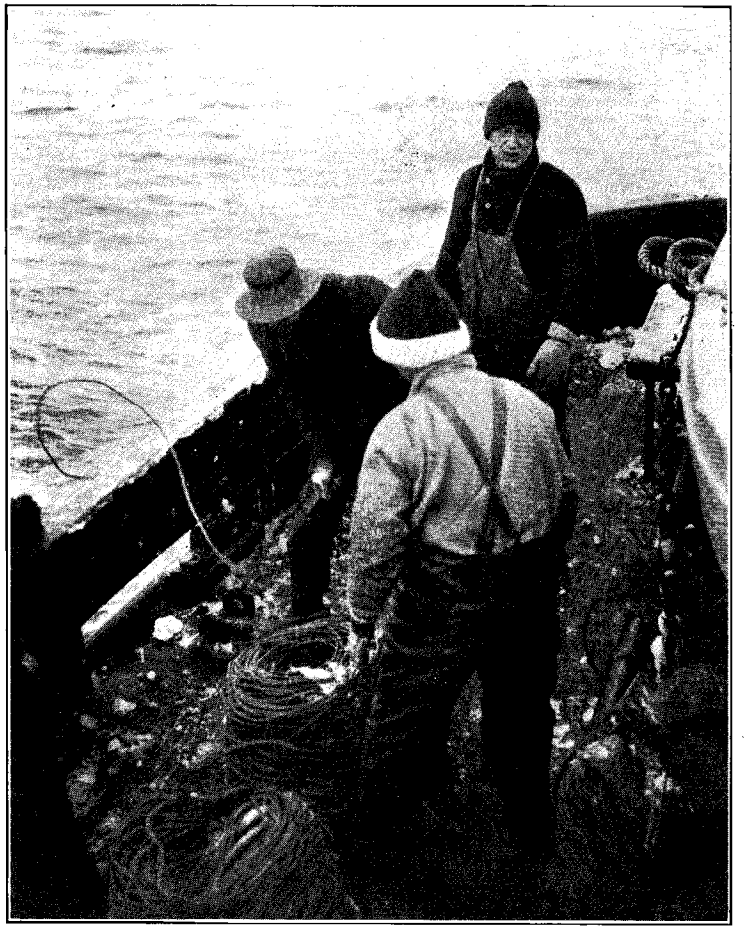

FIGURE 22.—One of the first attempts at long-lining or fishing directly from the deck. On the "James Carruthers," off Yakutat, 1913. Note the ice on the deck and the fishermen helping the line overboard.

FIGURE 23.—The powered gurdy which pulls the line in over the roller, while the fisherman coils. Photograph by Ernest Pegler.

FIGURE 24.—An unwanted gray cod comes over the roller and is jerked off. Photograph by Ernest Pegler.

convertible to purse seiners, hence of use not merely for halibut fishing but for salmon as well, and in after years this style of vessel became frequent, especially in Southeastern Alaska.

About this time, too, the fleet which had carried on pelagic sealing was lying idle in Victoria Harbor, awaiting the adjustment of its claims resultant from the elimination of pelagic sealing by the treaty of 1911. A number of these, of course, adapted for deep-sea voyages, were added to the halibut fleet, and engines were installed. The "Zillah May," the "Borealis," the "Carlotta G. Cox," and others were of this type, and became well known halibutters.

There soon came about a "boom" in the building of these powered vessels, resultant in part from the ready supply of capital eager for high profits. It was said at the time that many teachers, doctors, and others of the professional classes invested heavily. This boom reached its climax in 1913 and 1914. The complete change in motive power and build was indicated in 1915 by the return to the Atlantic of the "Victor and Ethan," which had come from there in 1911 in the hope that the advanced and perfected type of Gloucester auxiliary powered fishing vessel would meet the needs on the Pacific Coast. It could not compete with the new fleet, for the type of vessel with primary engine power that had developed on this coast was well adapted to enable the fishermen to reach the more distant new banks, and many of the vessels built in 1913 and 1914 are yet active in the halibut fleet.

EXTENSION OF GROUNDS NORTH AND SOUTH, AND OVERPRODUCTION

EXPLOITATION OF EAST SIDE OF GULF OF ALASKA, 1913 TO 1922

The exploitation of the offshore banks of Central and Western Alaska was now fairly under way. The United States Bureau of Fisheries, in its report on the fisheries of Alaska for 1913, states that "one of the present favorite grounds for the best-found vessels is that off Yakutat" (20), which is on the eastern side of the Gulf of Alaska. According to the *Pacific Fisherman* for September, 1913, heavy landings during the preceding month of August had been caused by the large catches from the newly discovered bank off Yakutat. The steamer "Independent" was said by that journal to have discovered these banks in that year. Others claim that it was the schooner "Idaho" which first fished on Yakutat Spit (21), it having fished there in March, 1913. It had previously been known that the grounds between Cross Sound (18) and Yakutat were productive (Joyce, 1913), but the discovery of this Yakutat Spit, upon which dense schools collected to spawn, gave the fishermen opportunity to make heavy catches late in the fall and early spring. The banks between Yakutat and Prince William Sound (23) were in that year spoken of as being lately developed. Either the steamer "Starr" or the schooner "Tom and Al" had the honor of discovering the so-called W Ground (21-22) in 1913, and had taken from them spawning fish much like those taken from near Yakutat. Captain Ericksen of the "Polaris" is credited by the *Pacific Fisherman* with the opening

of the grounds in the vicinity of Prince William Sound in the fall of 1913. In the reports of the Bureau of Fisheries this extent of the fishery is corroborated, for it is said "during the past few months (1913) explorations have been carried on by practical fishermen in the Prince William Sound district." Five small vessels made their headquarters at Cordova in 1914. It is possible, therefore, to date the exploitation of the highly productive banks along the eastern side of the Gulf of Alaska, from Yakutat to Cape St. Elias (22), as beginning in 1913.

This was accompanied and aided by a corresponding development of facilities for handling the fish thus taken. Cold storage capacity at Ketchikan (14) was enlarged, a new plant was built at Sitka (17) in 1913, plants were in operation at Wrangell (15), Juneau (17), and Taku (17). An attempt which might have been of great significance to the halibut fishermen because of the flexibility of the service it gave, was the fitting out of cold storage ships, the "Glory of the Seas," the "William H. Smith," and the "Metha Nelson." The first named, famous as a sailing vessel since 1869, had been a floating cannery in 1911 and 1912, but was outfitted as a floating cold storage in 1913, and operated at Idaho Inlet (18) during 1913 and 1914 and at Petersburg in 1916 and 1917. The second operated in Southeastern Alaska in 1912. The third near Kodiak (27) in 1912. But these projects did not succeed sufficiently to result in the permanent use of such ships.

The large cold storage plant established at Prince Rupert (13) was also of very great importance in the exploitation of the banks off Alaska. It had a capacity of 14,000,000 pounds and ice storage for 2,000 tons. Were the opening of Prince Rupert as the terminus of the Grand Trunk to have been unaccompanied by such cold storage facilities, it could not have succeeded to such an extent in capturing the major part of the halibut landings. It was subsidized by the Canadian Government.

This opening of Prince Rupert as the western terminus of the Grand Trunk Railway, occurred at a very favorable time for the expansion of the fishery to the north. The opening was, however, significant mainly because of the exhaustion of the southern grounds and the opening of the more northerly ones. Prince Rupert is not much more advantageously situated in regard to the Eastern markets than Vancouver and Seattle, and had the southern grounds remained undepleted, capable of supplying the demand, the southern cities might well have maintained their leadership as halibut ports. But the northward shift of the fishery was inevitable. The opening of Prince Rupert facilitated this movement, in that it provided a more northerly outlet, and saved the vessels the long trip of some three days each way to Seattle.

The Canadian Government encouraged the use of the port by the American fleet. It allowed the shipment of fish in bond when landed by an American vessel (Order-in-Council of December 10, 1914). This privilege was extended to dealers (March 9, 1915), who might, when licensed, buy such fish for export in bond. In 1916 this privilege was limited to shipment by rail only, except when between Canadian ports for transshipment by rail, but within the year this limit was removed. The 2½-cent duty on distillate for fishing vessels was waived. American vessels were allowed to take on provisions, ice, bait, fuel, and crews.

Competition was heightened, and the proper handling of halibut had been facilitated by the building in 1913 of a large cold storage plant, subsidized and open to the public at a fixed rate, which furnished ice, bait, and supplies at competitive prices. Dealers from all large firms marketing their fish in the East found it imperative to locate here, and new dealers also entered the field. The United States duty on halibut had already been removed in 1913, and this fact stimulated the growth of a Canadian fleet landing in Prince Rupert. The first United States vessel, the "Prospector," shipped its catch over the Grand Trunk on December 9, 1914, but American landings began in earnest in Prince Rupert in April, 1915. The cold storage plant had sold its first ice in 1912[7], and had frozen 3,000,000 pounds in 1913. The final result was not merely the routing through Prince Rupert instead of Seattle and Vancouver of nearly all the halibut destined for the East, but the increase in the prolific fishery to the north, and resultant profit to the fisherman. The decline in productivity of the southern grounds was more than made good.

This great shift in the fishery was, it should be emphasized, due to the decline in the southern yield and to the depletion of the older banks, and control over the eastward flow of halibut could be restored to the south only by rehabilitating the banks there.

Nevertheless, the United States Government was appealed to for help by American organizations in Seattle, supported by others in Ketchikan. Secretary Redfield replied that the opening of Prince Rupert was on the whole an advantage to Americans, and that the only aid which could be given was the development of new southern banks.

EXPLOITATION OF NEW SOUTHERN GROUNDS

During the interesting period of expansion to the north there had been almost equally interesting changes to the southward. From time to time vessels had explored the grounds along the coast south of Cape Flattery, frequently without much success. Here, as elsewhere, demonstration of the mere presence of fish was not sufficient, for the best fishing spots and seasons had to be learned by experience. In 1911 the "Weiding Bros.," a steamer from Tacoma, had prospected as far south as Heceta Bank (1), but met bad weather. Another vessel was the launch "Red Wing," out of Hoquiam (4), in 1912. Another, the "Vida," out of Bay City, in 1912. The "Zillah May" was purchased in 1912 to enter the trade from Aberdeen (4), Washington. Small boats fishing out of Newport (2), such as the "Ollie S.," had taken very good catches in the near vicinity, using hand lines. This attracted much local attention, and in 1912 there were several efforts to establish fishing companies and to outfit boats for the supplying of markets along the Oregon coast. There were eight gas launches outfitted in Newport for halibut fishing in 1913. This activity led to the request, both through Congressional channels and directly to the

[7]To the "Fishmaid," Captain Thurber.

Bureau of Fisheries[8], that the Federal Government explore, or prospect, these banks, and the vessel "Albatross" was detailed to carry on this work. This move was opportune, since at that time the completion of the Grand Trunk to Prince Rupert was decreasing the landings in Seattle.

The development of these banks did not depend upon such explorations entirely. In the meantime several boats from Seattle, the "Idaho" and "Chicago" more particularly, had tried without much result. The schooner "Decorah" had begun operations on these southern grounds in 1914, landing its fish in Portland, making its first trip in May. The schooners "Daisy" and "Zillah May" and other smaller boats were active in the time the investigation by the "Albatross" was under way[9]. The operations of the latter vessel resulted in additional soundings and a better knowledge of the grounds, but the fishing trials carried out were of little significance. A shore party from the "Albatross," using a launch, later carried out operations off Yaquinna Head (2) in company with small boats already there, and corroborated the reports of good fishing, finding 200 to 500 pounds per skate of eight lines. Publicity from these attempts led to exploration of the grounds from Grays Harbor (4) to Heceta Bank (1) by the Seattle fleet, and the making of a series of good catches in the spring of 1915, when nearly 3,0000,000 pounds were said to have been taken into Seattle in the month of May [10] from the new grounds (*Pacific Fisherman,* June, 1915, pp. 11, 20; Johnston, 1917, p. 19). This catch was heavily culled, often 50 per cent of a catch being rejected because it was "mushy" or "wormy," but as the fish became scarcer this condition disappeared.

In response to a communication from the Fishing Vessel Owners that the "Albatross" could better be engaged in sounding out new banks, leaving the discovery of the halibut "spots" to the fleet, the "Albatross" the next year spent her time largely in sounding. It was demonstrated that no new banks lay offshore to the southeast of Cape Flattery.

Since 1915 the amount of fish taken from these southern grounds has not been so great, only occasional visits being made by the larger schooners. It seems certain that the great yield of the first two years swept off much of the accumulated stock. The Bureau of Fisheries records an average yield of one and a half millions of pounds up to 1920, but the accuracy of the banks of origin given is questionable. At present about half a million pounds are each year landed by smaller schooners in Portland, Astoria, and other cities, such as Newport. The harbors along the coast are not entirely suitable for the shelter of a halibut fleet, and the local markets are insufficient to handle the fish if in quantity, as was discovered during the first great exploitation.

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[8]The statistics of halibut landed in Oregon, given by the Bureau of Fisheries, are as follows:

1889	487,250	1892	18,870
1890	16,450	1895	5,000
1891	43,930	1899	17,000

The landings from Multnomah County in 1889 were very likely erroneous, since in subsequent years the approximate amount shown was imported from Puget Sound. In all later years the total catch came from Coos and Clatsop Counties.

[9]Beginning April 29, 1914. See Bureau of Fisheries Documents 817 and 835.

[10]Amounts 853,300 pounds from May 10 to September 15, 1914. 3,000,000 in May, 1915, according to Pacific Fisherman.

OVERPRODUCTION 1914 AND 1915

Reviewing the various developments since 1910, it will be seen that there had been a great expansion of the fishery both to the south and to the north. Facilities and competition for the product had been increased. Capital invested by dealers and by vessel owners had multiplied. A new and able fleet had been created for the exploitation of the banks in the Gulf of Alaska, but the older banks were showing depletion and the new supply of fish cost more.

It was said of British Columbia waters, to quote reports of the Canadian Department of Marine and Fisheries (1914-15, p. 253): "It has been found absolutely impossible to keep up the tonnage of the catch, although more boats and gear are being employed each year." And in 1915-16 (p. xxxix): "The halibut fishery is steadily declining from year to year, although the better prices received in the year being reviewed make the total value greater than in the preceding year." Vessels were compelled to go farther for their catches, and the costs of operation were not lowered as far as they might have been by the additional mechanical conveniences. "Smaller catches and longer trips were the rule, owing to the fact that it was necessary to search from place to place before a trip could be made. More supplies were necessary." (Captain A. Freeman.)

The new vessels from United States ports were also operating at a higher level of cost of production, both from the standpoint of capital invested and labor costs. The fleet, both fishermen and boat owners, had become organized in 1913, the former as a branch of the Sailors' Union of the Pacific, the latter as the Pacific Coast Fishermen's Association. The last named was later reincorporated as the present Fishing Vessel Owners' Association. The fishermen on the larger vessels had struck successfully in 1913 for a larger share, four-fifths instead of three-quarters of the trip. They struck again in the spring of 1916, gaining by having part of the gear paid by the vessels. Finally the abolition in 1913 of the United States duty on fresh halibut had stimulated the growth of the Canadian fleet. In short, it would appear that there was justification for the opinion that too many vessels, operating at too high a cost, were overproducing (Pacific Fisherman, May and August, 1914).

This overproduction led to many complaints that have had consequences in the years following. For the time being the building of large vessels was halted, as is shown in later pages. But those that remained produced very heavily during the mild weather in the fall and early spring of 1913 and 1914. Fish then were spawning and densely schooled at Yakutat (20-21), the newly discovered banks along the east side of the Gulf of Alaska. The result was that prices were very often too low to be profitable. In 1913 too much fish was frozen by the many plants built since 1910, and this product could not be properly disposed of, judging by comment in the Pacific Fisherman. The small boat men who were confined to the more depleted banks made bitter complaint of the effect of the frequently bunched landings of the larger vessels, and a winter closed season was talked of.

This seemed a good idea, because even to these larger vessels the winter months from November 15 to February 15 were unprofitable, due to bad

weather, scarcity of bait, and poor prices. When fish were abundant because of good weather on the spawning grounds, too many halibut were sure to be caught, for the schools were dense. The spawning fish were said to be of poor quality. A closure would allow frozen fish to move and would eliminate competition between it and fresh fish. Overproduction would cease and prices would be better and more constant, particularly for the small boat men. Not so much gear would be lost in winter weather, and perhaps many men believed it a shame to catch spawning fish. Later came the severe winter of 1916, with the loss of a steamer, the "Onward-Ho," through freezing weather, during a gale from glacier-covered Mt. St. Elias and the Fairweather Chain (19-21), and the winter fishery seemed hazardous and hard.

But in 1916 the fishermen struck, diminishing landings greatly from March to July. During the following years of the Great War overproduction stopped, and the total landed fell while prices rose. It became harder to finance new construction. Moreover, closure meant international action, and such is always slow, so legislation was delayed.

FURTHER MECHANICAL EVOLUTION OF FLEET AFTER 1913

Following this period of expansion of the grounds and overproduction, the development of the fleet continued. True enough, there was a period of years from 1915 to 1923 or thereabouts when new banks were not so eagerly sought, but methods were steadily improved.

Better mechanical features had been developed for the vessels, enabling them to prosper on but a fraction of the former yield per unit of gear. Electric lights were put on the larger vessels in 1912 and 1913 ("Montana" in 1911). These were at first 6-volt systems, capable of displacing the dangerous oil lamps but not permitting deck lights, and for night work torches were used as late as 1915. But at that time little night fishing was done. Then 16-volt systems were installed and deck lights permitting night fishing came into vogue. At the present time 32-volt systems are standard equipment. Up to 1913 the schooners still had rope for anchoring, hard to handle in any depth, but the steamers had steel anchor cables hauled by power. In 1913-1916 these became stock equipment for the large schooners, and with them came better powered winches and the possibility of anchoring on the banks. Better pilot house control also was developed. Dories were lifted aboard by power instead of by hand. In 1914 and 1915 oil lanterns were tied to buoys in order to keep track of the gear during the night, but by 1920 battery lights in waterproof cylinders were developed. Cork insulated holds and even refrigerating machinery were installed in vessels built in 1925 (such as the "Attu," "Radio," and "President"). The march of increased efficiency could have been detected in a thousand ways.

Prominent among these was the development of long-line fishing. This term was used because the dories were not needed, but the lines were paid out over the stern of the vessel, and instead of the short two or three skate string,

a longer one of six or eight skates was used. This method of setting from the vessel itself was said to have been used by small vessels previous to 1913. There is mention of the gurdy in 1910, at first without a clutch which could be operated by the man at the roller (Pacific Fisherman, November, 1910).

The "James Carruthers" from Prince Rupert, in the charge of an English captain from Grimsby, was the first steamer to long-line from Prince Rupert, in September, 1913. The senior author accompanied this vessel on the trip during which this method was first used. The skate of gear was set on the stern of the vessel and a fisherman took his stand near by with a short stick. With this, and after the first buoy was thrown overboard as the vessel ran, the line was thrown up and out to keep the baited hooks clear. Other skates were attached as needed, until the string was complete, when another buoy and anchor were thrown overboard. The line was hauled by the power gurdy in the waist of the ship, over a roller[11] on the port or starboard side (the starboard side is always used at present).

This method made many changes in the established dory fishing, and it was rapidly improved. In the first place, it required a different method of laying out the gear. Whereas before the dories were set out in a line, and parallel strings of two or three skates each set, now this need no longer be the case, and setting the gear was done as convenient, not all at once, nor in a block. The number of men was reduced. Fishing in worse weather became possible, although many dory men will rather doubt this even yet. To avoid danger to the man setting the gear at the stern, a chute[12] was invented over which the line was raised and paid out without being touched. For convenience the hooks were set 13 feet apart instead of 9, as was best in the dory. The change in number of hooks was not a distinct loss, as the catch when fish are somewhat scarce is, after all, determined by the extent of ground covered than by the number of hooks, and the long-line method of handling the gear gave very nearly as high an average catch per skate as when the 9 foot dory gear was used. In this case, too, it is hard to convince the dory man that his gear does not in the long run catch more than the long-line gear, and only the averages of many catches of both types of boats can be relied upon. In large schooners the long-line method has not completely displaced the dory, as our records show, but the change has been complete in the smaller vessels and threatens to become so in the larger. In the end a more efficient type of vessel has been developed, one that has been able to fish 24 hours per day when needed, even in the darkness of the long winter nights of Alaska, and it has become possible to handle the gear much more rapidly.

The question of power has been a fundamental one. It had already given to the halibut vessel lights and winches which were capable of hauling the gear and of lifting the steel-cabled anchors from great depths. But the expense of running was high, and few vessels were equipped to go far. Transportation of fuel to the far west for replenishment of vessels was expensive, and in fact

[11]Previously used in Europe; used by "Roald Amundsen" and other boats in 1913.

[12]Used in 1913 by the "Roman," the "N. and S." and others. See Figure 20 for chute on the "Jupiter," July, 1915.

was not undertaken by the oil companies until 1923, when the Standard Oil Company began in April the operation of a new tanker, the "Standard Service," to Seward (25) and Kodiak (27).

But in 1920 the Diesel engine had been developed to a high degree of perfection. A sudden stimulus was given to its adoption by the refusal of the oil companies to market distillate any longer because they needed this to make gasoline for the rapidly rising flood of automobiles. The consequent general adoption of this type is one of the important events in the history of the halibut fishery.

Diesel engines had originated in Germany in 1892, but they underwent a gradual process of development and were not adapted to use in the fishing vessels until much later. In 1910 the cost per hour for 100 horse-power was given as 14 cents for Diesel oil (crude), as compared to $1.05 for distillate, which was then largely in use (Pacific Fisherman Annual, 1910, p. 92). Fuel economy was very great, but the halibut vessel needed absolute reliability.

During its early stages[13] the Diesel was not uniformly successful in fishing vessels despite the fuel economy, whereas the gas and distillate engine had reached a high degree of reliability. The first Diesel installation in a commercial fishing vessel on the coast was said to have been the cannery tender "Warrior" in 1913, but as has been said, it was not until 1921 that its use really began in the halibut fleet. The "Republic" was said to have installed the first Diesel in 1921. The transition was fairly rapid, and in 1923 a great many installations were made. From that time on such engines were the rule on new boats and were rapidly substituted on older boats using 35 horse-power or over. The advantages were many, for the crude type of oil used is not merely cheaper, but has more heat units per gallon than distillate; it is not explosive in nature, and need not be carried in drums on the deck of freight steamers at great cost, a matter of importance throughout Alaska, where transportation is vital. The resultant economy enabled vessels to undertake longer cruises and disaster through explosions and fire became less frequent.

NUMBER OF STEAMERS KNOWN TO BE OPERATING EACH YEAR FROM 1892 TO 1929. FROM VARIOUS SOURCES.

1892	2	1902	2	1912	13	1922	4
1893	1	1903	3	1913	18	1923	6
1894	3	1904	5	1914	17	1924	5
1895	3	1905	14	1915	15	1925	1
1896	4	1906	11	1916	15	1926	1
1897	5	1907	13	1917	14	1927	1
1898	6	1908	10	1918	11	1928	1
1899	4	1909	11	1919	9	1929	1
1900	2	1910	13	1920	9		
1901	4	1911	13	1921	4		

The fleet, therefore, in the years between 1910 and 1923 had been developing toward a type capable of going farther afield. During these years the steamer had been the principal competitor of the schooner. It was always a company boat, owned and operated by large concerns, whereas the powered schooner was owned by a fisherman, financed perhaps by a supply company. As the schooner

[13]The New England Fish Company proposed to use crude oil in two vessels to be built in 1912, the "Bay State" and the "Knickerbocker." The "Comet" of the San Juan Fish Company was scheduled to have a Diesel in 1916, the "Southwark-Harris."

developed in efficiency the companies added a number of fine vessels of that type to their fleets. But economic conditions rendered company operation steadily more difficult in competition with the independent boat. The reasons for this failure of the company owned vessels are not apparent to us, and it does not seem necessary for our purposes to attempt an analysis. At the present time there are but two such vessels in use.

The rise and fall of the steamer fishery is shown in the accompanying table. Only one is operating now.

Facilities for handling the catches were also perfecting. In 1916 there were plans for a cold storage plant at Seward, and in 1921 these materialized. Fuel oil became available there and at Kodiak. Other cold storage plants had been built at Ketchikan, Juneau, and Taku. It was possible to go far westward, around Kodiak Island, and if bad luck were met with to sell the broken trip at Seward, outfit again and try for another full catch to the southern markets.

EXPLOITATION OF BANKS WEST OF GULF OF ALASKA AND THE CLOSED SEASON, 1923

As in the case of the older banks, those west of Cape Cleare (24) had been well known from early days, and attempts to fish there were made long before their real exploitation began. A firm had carried on a series of trials from Kodiak in 1912, finding a good yield of halibut. Vessels visited Portlock (25-26) and Albatross (28) Banks in 1913, 1914 and 1915 without a great deal of encouragement. In 1916 the "Starr" prospected as far west as the Shumagin Islands (32). The Bureau of Fisheries records landings in Seattle from Portlock Bank in 1915 as the most distant then resorted to. But in 1916, 14 per cent of the fish landed in Seattle were said to come from Portlock. In 1919 and 1920 the percentages from that bank were 2 and 7, respectively, and there is mention of one trip from Albatross Bank. Obviously the variability of these figures leads to some suspicion as to their correctness, but it is said that the high prices during the early years of the Great War led some distillate boats to fish westward. However, it was not until 1923 that the exploitation of the banks there was really begun in earnest by the large schooners equipped with Diesel engines. The relative importance of this distant fishery has steadily grown, and in 1928 the first fish to reach market from Bering Sea was landed. It is, therefore, fair to regard the period from 1923 on as that of expansion of the halibut fishery over the banks west of the Gulf of Alaska, largely as the result of the Diesel engine.

The history of the further mechanical development of the fleet and of the facilities upon which it depends cannot yet be written from the standpoint of the expansion of the fishing banks. The more distant trips are the result, as yet, of better preservation of fish, faster boats, and minor improvements which enable profitable trips to be made during the best seasons. Whatever expansion has taken place has been a continuation of the change which was made in 1923

by the adoption of the Diesel engine, and it cannot be said that any major development has occurred which will enable any extensive change in the fishery to be anticipated. It is freely said by the owners of the larger vessels that the abundance of fish is declining on the newer banks and that they look forward to a harder time to make a living. They are being forced as far west as they can go with their present vessels.

Since 1923 the event of greatest interest has been the signing of the treaty imposing a closed season of three months from November 16 to February 15, inclusive. This came about as the result of a very remarkable unanimous sentiment for the closure. The history of the growth of this sentiment and the adoption of the treaty is dealt with below (p. 54).

In a sense the expansion of the fishery to the west must have been accelerated by the closure of the winter season, and yet the development of the fleet and the opening of the western banks to profitable exploitation must have been responsible for the favorable reception of the closure. The fishery along the banks of the east side of the Gulf of Alaska is, as has been said, essentially a winter one, best during the spawning season. The fleet built to exploit the offshore fisheries could not have existed at first without it, and it is improbable that the winter season would have been closed if it meant disaster to the larger vessels. But by 1924 this fleet had developed, had adopted Diesel engines, and the exploitation of Portlock Bank had fairly begun. They were no longer entirely dependent upon the banks most affected by closure, for they had not merely the older fishing banks, but the new ones at Portlock and west, whereby they could extend operations throughout the season. The closure of the spawning grounds was not such a vital matter to the larger vessels as had previously been the case, but it eliminated what was in fact an embarrassment to fleet and trade alike. The larger vessels, being in a position to use other banks, either did not oppose, or made no effective opposition, to the treaty, and once the closure became effective their efforts were directed to Portlock and banks west. The closed season and the treaty were, for this reason, both the result, and a part of, the process of evolution of the fishery. They definitely mark the close of a well-marked period, the exploitation of the banks along the eastern side of the Gulf of Alaska.

An interesting reaction to the decline in the Pacific Coast halibut abundance has been the interest shown in Japanese halibut. Various sources of information are to the effect that an abundance of halibut is to be found in the Strait of Nemuro, between Hokkaido and the Island of Kunashiro. It is also found in other north Hokkaido waters, on the west coast of Kamchatka, along the Siberian coast and the Kuriles. Halibut, which is caught in the winter, is used at times for fertilizer and only to a limited extent for food.

There was some discussion of shipments to the United States in the winter of 1924, but they did not materialize. The importation from Japan of 860,000 pounds of halibut in the fall of 1925 is well worthy of note. It was said to be in poor condition, due to unskillful handling, and that the venture was not financially successful. However, there have been other shipments since then, and it remains to be seen to what extent the business will develop. Importations

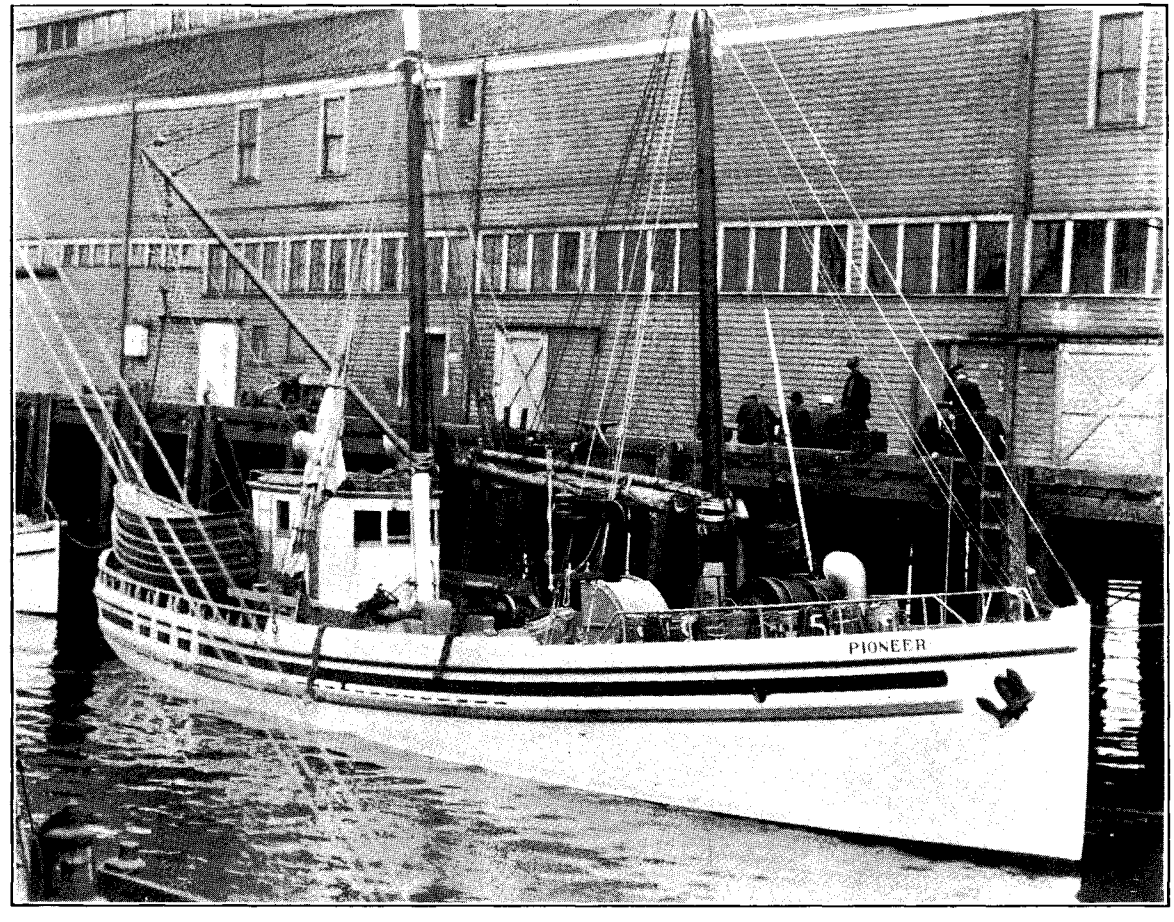

FIGURE 25.—A Diesel-powered dory vessel of a type still in use. Built in 1914. The dories are nested on the stern, there is a gurdy amidships, and a steel anchor cable and winch forward.

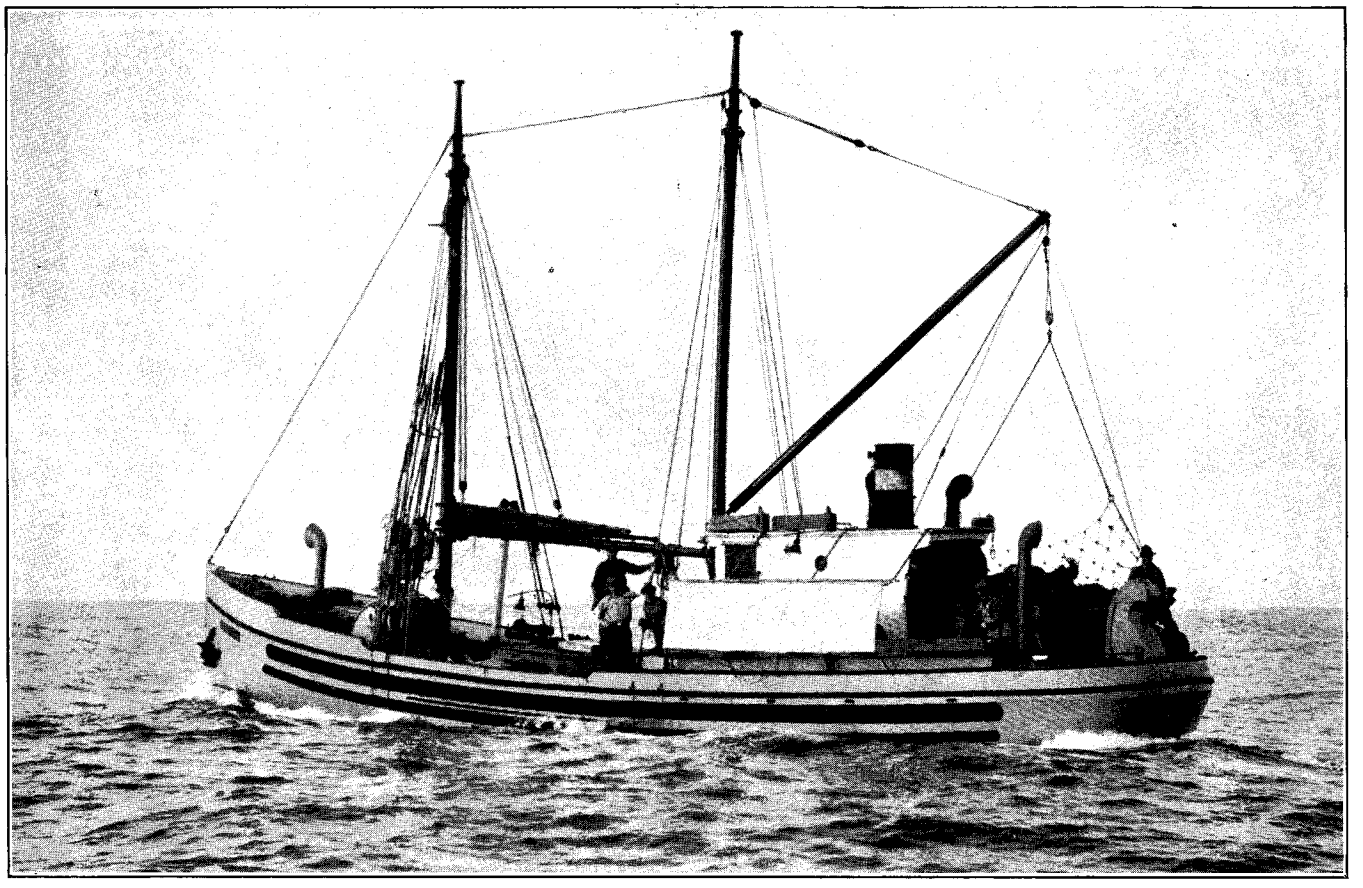

FIGURE 26.—The "Marmot," built in 1926. A modern Diesel-powered long-line boat. Her dories are not for fishing. Note the electric lights, power gurdy, canvas shelter for bait tables, and chute on the stern. The sail is almost lacking.

of this kind are more particularly a threat to the production of halibut for freezing on the American coast, since such fish cannot be brought in fresh due to the distance and the time required. As was the case in the origin of the halibut industry on this coast, a period of years may be necessary to develop methods of handling, or better mechanical equipment may have to be developed. But the existence of an untouched supply of halibut anywhere must be a possible factor to be reckoned with in the future.

INTERNATIONAL RELATIONS AND THE CLOSED SEASON

International relations underlie nearly all conditions to be considered by a regulatory power, the needs of which have called forth this report. The fleet is divided into several sections, each with its particular banks, as a result of national interests and restrictions. The landing ports have their special interests and their own attendant fleets, largely affected by international relations. These have evolved through the years, and an understanding of them is essential to formation of measures of conservation, as well as to an understanding of the history of the fishery, particularly its statistics. Since the halibut fishery as a high seas fishery must be regulated by international action, the conditions met with must be understood if conflict of interests is not to lead to defeat of measures proposed.

Moreover, the conditions under which the present closed season has been adopted by treaty are instructive in any consideration of its actual effect and purposes.

In the preceding history of the halibut fishery, the main points of interest have been the progressive exploitation and depletion of the banks. International relationships interfered very little with this until the present treaty was consummated, but they have proved of significance to present conditions. The maintenance of the three-mile limit to the approach of foreign vessels to any shore during fishing operations, restrictions upon port privileges, tariffs, and joint action by treaty, have all played parts in the formation of the present situation as it must be met by a regulatory power.

The three-mile limit has been enforced by both countries since the beginning. In the case of small boats, fishing in shoaler more protected waters, it is of considerable importance. For that reason there is a well-defined American fleet of small vessels fishing the Alaskan inshore waters, and an equally well-defined Canadian fleet of small vessels fishing the British Columbia passages and inside waters. These fleets find it possible, however, to fish outside the three-mile limit during the summer months, and the closure of territorial waters to them is a hindrance, but not a preventive. The Seattle market has been, to an increasing extent, furnished with fish from the Goose Island Banks, which lie off the coast of British Columbia and are exploited mainly by American vessels. With better vessels and reliable power, Hecate Strait and the outer waters of British Columbia have everywhere become accessible to United States vessels outside the three-mile limit.

Restrictions upon port privileges, particularly those of securing bait and supplies, have been of some importance, but have been relaxed by Canada in order to secure the transportation of American halibut through Canadian ports and over her railroads. The successive steps in this relaxation will be dealt with below.

The tariffs have played a still more important part. They have acted to restrict the size of each country's halibut fleet to the size of the market within its own country. The market in the United States is, of course, by far the larger, and in accordance, the United States fleet has been the larger. They have also acted to restrict the landing ports. Thus a Canadian vessel, fishing along the coast of Alaska, finds itself handicapped in the disposal of a broken trip, which must be sold in some of the western ports and pay the duty.

It is not properly a part of the present report to deal with these matters in detail. But sufficient should be given so that the course of events in regard to the present treaty can be understood, as well as the present condition of the fishery.

EARLY TREATY RELATIONS

By the treaty of 1783 between the United States and Great Britain, terminating the American Revolution, certain rights and liberties were agreed upon with regard to the fisheries of the Grand Banks of the Atlantic, the coastal waters of Britain's American colonies, and the privileges of fishing vessels in her ports. This treaty was held by Great Britain to have been abrogated by the War of 1812, although the United States contended that this was not the case. However, a new treaty was entered upon October 20, 1818, which redefined and limited the liberties enjoyed by United States fishermen within coastal waters of Canada and Newfoundland.

This treaty has since been the subject of much dispute as to the meaning of the liberties granted, as to the definition of the waters within which the United States could or could not claim rights, and as to the qualification of these liberties through "reasonable regulation" by Great Britain and her Dominions. During the presence of American fishermen on these coasts, conflict was sure to occur between the varying interpretations of the various rights and privileges, particularly in view of the lack of precision as to what constituted the division between high seas and territorial waters.

Various diplomatic attempts have been made to reach more definite understanding. In 1854 a treaty was consummated providing reciprocal privileges for British and United States fishermen and for reciprocal abatements in customs duties. This treaty was terminated in 1866 by the United States, but the privileges of American fishermen in Canada were continued under a system of licenses until 1870.

MODUS VIVENDI

In 1871 another treaty was entered into similar to that of 1854, and this endured until 1885, when the United States terminated it. Again temporary diplomatic arrangements continued the application of American privileges for a season. Friction arose immediately upon cessation of these privileges, and to eliminate the source of disagreement another treaty was negotiated in 1888 dealing with the question of bait and commercial privileges. The United States Senate refused to ratify this, and it never became operative as far as the United States was concerned, but the negotiators had provided a *modus vivendi* pending legislative action in ratification of the treaty.

This *modus vivendi* governed the relationship of the American fleet in British waters for many years, and defined the concessions of the British Government to American fishermen. Was the *modus vivendi* to fail, it is plain that the provisions of the treaty of 1818 would apply, and as has been said, these provisions were subject to dispute as to their meaning. Treaties to clarify these were arranged in 1890 and 1902, but did not become effective, the United States Senate refusing to ratify where reciprocal freedom from customs duties was involved. Friction thus continuing, the treaty of 1818 was, in 1909, submitted to arbitration before a tribunal chosen from the members of the permanent court at The Hague. The terms of this decision are of very considerable importance to Canadian-American relationships in the fisheries, and they govern except in so far as they are modified by subsequent treaties or the granting of special privileges under the *modus vivendi* of the treaty of 1888[14].

In these negotiations there had been a disposition to exchange an extension of privileges to United States vessels in Canadian waters for access of Canadian fish to the United States market. Accordingly, when in 1913 the United States removed the duty on fresh and manufactured fish going into that country, it requested such an extension of the privileges of the American fishermen. This was not favorably regarded by Canada because Canadian fishing vessels were not allowed to enter United States ports direct from the fishing grounds nor to clear for them directly. Negotiations in regard to this proceeded for two years, ending with the appointment of a joint commission to consider certain proposals made by Canada, including an extension of the *modus vivendi* to the Pacific.

RELATIONSHIPS IN THE PACIFIC

The situation in regard to the halibut fisheries of the Pacific had been developing as a result of tariff and transportation changes and as a result of the extension of certain privileges to American fishermen landing their catches in British Columbia ports.

The Canadian Government had been requested in 1894 to allow the New England Fishing Company to land fish from American vessels in Vancouver

[14]See North Atlantic Coast Fisheries Arbitration, Case of Great Britain, Vol. IV.

and to ship this in bond to the United States market. This privilege was granted by an Order-in-Council of 1897 and has been maintained since by successive renewals. Previous to 1913 this privilege was of very considerable importance since the tariff on fresh halibut entering the United States was one cent a pound. Furthermore, previous to the year 1906 or 1907, the corresponding Canadian tariff was one-half cent a pound, thereafter one cent a pound. As a result of this tariff relationship, and as a result of the privilege of shipping in bond, there was maintained at Vancouver a fleet, partially American and partially Canadian, to correspond with the markets available in the two countries.

With the placing of halibut upon the free list by the United States Tariff Act of 1913, the American market was open to Canadian halibut. This occurred just previous to the opening of Prince Rupert in 1914 and stimulated the growth of the Canadian fleet operating out of Prince Rupert, particularly in the waters of British Columbia.

The opening of Prince Rupert as the terminus of the Grand Trunk Railway gave access to the Eastern markets by a rail route nearly the same as from Vancouver or Seattle, but involving a trip by vessels bringing in Alaskan fish of a thousand miles less, which rendered it the logical landing port for the American fleet. Accordingly, on December 10, 1914, the Canadian Government by an Order-in-Council permitted landing of American fish in bond for shipment by the vessel or its owners, as had been the case at Vancouver. This did not enable the American fleet, particularly the smaller vessels, to make extensive use of Prince Rupert, and the order was extended on March 9, 1915, to permit the sale of American fish to licensed dealers in Prince Rupert. Privileges of shipment in bond were at first restricted to rail. Provisions could be purchased and crews shipped, but (1916) bait could not be taken unless the Canadian customs was assured that the fish caught by such baiting were subsequently landed in Canadian ports. Subsequently the privilege underwent successive modifications to allow shipment by vessel to ports in the United States, thus facilitating the disposal of second-grade fish. Finally, purchase of bait was allowed without restriction.

The result of these orders was the rapid growth of American landings at Prince Rupert. The greater part of the fish destined for Eastern markets was therefore landed at Prince Rupert rather than at Seattle. Ketchikan was also affected by this change, since that city was regarded as the natural outlet for Alaska, and it made every effort to secure the benefit of the large fleet fishing in Alaska. Strong attempts were made to secure the enactment of legislation which would require the landing of fish at an American port before being shipped in bond through a foreign country.

A bill was introduced in the United States Congress May 20, 1916 (HR 15839) to this effect. This bill was supported by commercial organizations both in Seattle and in Ketchikan under the belief that the transfer of American vessels to British registry was imminent. The proviso was ultimately attached to the revenue bill under consideration in 1916. The British Ambassador protested against the adoption of this amendment, stating that it would be regarded

as an unfriendly act in view of the conditions prevailing between the two countries, especially on the Atlantic. The fishing industry at Gloucester, in fear of retaliation against the Atlantic fleet, also was instrumental in defeating this amendment. Attempts have subsequently been made to secure such legislation, but each time strong opposition from the American fleet has developed, and adoption has been prevented.

INTERNATIONAL JOINT COMMISSION

There were, therefore, important questions to be settled both on the Atlantic and Pacific. These questions, as has been said above, were submitted to a joint commission. This commission met in January, 1918, and held meetings at Gloucester, Seattle, Vancouver, Prince Rupert, and other cities. To this commission were also submitted questions as to the preservation of the halibut fishery and as to the rehabilitation and protection of the sockeye salmon of the Fraser River. It had, therefore, to consider reciprocal fishing and port privileges of the Canadian and American fleets and the conservation of the halibut and salmon.

At this time the United States had entered the great European War, and the joint commission was instrumental in obtaining a wartime agreement. On February 20, 1918, the United States Secretary of Commerce, acting under authority of the President, issued the following order:

> "To promote the vigorous prosecution of the war and to make the utmost use jointly of all the resources of the nations now co-operating, you will permit, during the war, Canadian fishing vessels and those of other nations now acting with the United States, to enter from and clear for the high seas and the fisheries, disposing of their catch and taking on supplies, stores, etc., under supervision as in the case of merchant vessels entering and clearing for foreign ports, except as to tonnage tax and other charges specifically imposed on entry from and clearance for foreign ports."

On March 8 the Canadian Government issued the following Order-in-Council:

> "The Minister of the Naval Service recommends, under the authority of the War Measures Act, chapter 2 of the Statutes of 1914, that during the war, United States fishing vessels, in addition to their treaty rights and privileges, shall be permitted to enter any port in Canada, without the requirement of a license or the payment of fees not charged to Canadian fishing vessels, for any of the following purposes:
>
> (a) The purchase of bait, ice, nets, lines, coal, oil, provisions, and all other supplies and outfits used by fishing vessels, whether the same are of a like character to those named in this section or not;
> (b) Repairing fishing implements;
> (c) Dressing and salting their catches on board ship;
> (d) The shipping of crews;
> (e) The transshipment of their catches;
> (f) The sale thereof locally on payment of the duty.

"The Minister further recommends that the fees paid on licenses already taken out for the present calendar year be remitted."
These orders applied to Pacific and Atlantic ports alike.

This temporary arrangement, which governed the American and Canadian fishing fleets during the period of the war, was cancelled on the part of the United States on July 15, 1921, although it did not terminate entirely until September of that year. On its part, the Canadian Government in 1922 restored the license fee for American vessels to $1.50 per registered ton, but later lowered it to the wartime fee of $1.00 per vessel.

FIRST HALIBUT TREATY

As a further result of the joint international commission, a halibut treaty was drawn up. This embodied reciprocal port privileges, the elimination of customs duties on halibut, a closed season from November 16 to February 15, a joint investigation of the life history of the halibut, and the prohibition of nets in certain fresh waters. The treaty was to last 15 years. Strong objection to the reciprocal privileges arose in the United States Senate and the treaty never became effective, although the closed season met with universal approval. It became evident that protective legislation for the halibut and salmon could not pass when complicated by the consideration of reciprocal port privileges.

CLOSED SEASON

Interested as we are in the conservation and regulation of the halibut fisheries, the more detailed history and final adoption of this closed season will prove of importance in understanding its significance and application.

It has already been shown that the origin of this closed season was connected with exploitation of the spawning banks along the eastern side of the Gulf of Alaska. These banks gave a very heavy yield of large spawning fish during the months of November and December especially. The markets were profoundly disturbed by this heavy production, by the rather poor quality of the spawning fish obtained, and by the irregularity of the landings. The exploitation began in 1913, as has been said above, and by May of 1914 there was apparently already a disposition to seek some remedy for the overproduction and for the unsatisfactory condition of the halibut trade.

The first appearance of the closed season in the literature is an editorial in the Pacific Fisherman of May, 1914, which it is fair to presume reflected the feeling of the trade. The fleet of halibut boats had steadily increased, due to prosperity since the adoption of power. There was too much frozen halibut, for there had been a great increase in cold storage facilities. There had been mild weather permitting of heavy fishing, and there were gluts on the market caused by the bunching of landings. The conclusion was that the halibut fish-

eries were overworked and that some limitation was necessary unless distribution could be improved. Various remedies were suggested, such as the pooling of all the boats in order to regulate the catch and render it more even. Mention was also made of the desirability of a closed season during the winter months and that such would require international action. The same journal, in its August issue, dealt with the subject in somewhat more logical form. The increased cost of the halibut to the consumer was laid to the greater expense of operating vessels. Longer trips were necessary due to the depletion of the nearby banks, and higher costs were charged to more expensive vessels and to the success of the fishermen's strike. The rising competition from the Canadian fleet was also cited. Due to the long trips, the product was subject to deterioration. In short, the cost of production had risen, the quality was not as good, and there was too much landed as a result of the rapid increase in both the Canadian and American fleets. At this time, however, special emphasis was not laid upon the closed season.

It is noteworthy, therefore, that the closed season had its origin definitely in a period of overproduction and as the result of a preceding period of prosperity. It was the expansion of the grounds and the increase of landings which were directly responsible. Mention was made of the depletion of the older banks, but it was not the condition of these older banks which concerned the trade so much as it was the excessive yield from the more newly discovered grounds.

In the years following there was shown a remarkable unanimity with regard to this closure. For the first time the adoption of a closed season was urged specifically. Arguments were direct and very concrete. The market for frozen fish was in very poor shape, a low price being secured. The jobber was afraid to buy frozen halibut because of the danger that he would have to sell in competition with large quantities of fresh fish. Moreover, this winter season was expensive to the fishermen on account of the irregularity of the fishing, which was due to bad winter weather and to the consequent loss of gear. The fish caught were breeding and in poor condition. Closure would not merely avoid overproduction, but the banks would be given a much-needed rest. Frozen fish would be given a clear field in the market, enabling better prices to be paid during the remainder of the year. During 1915 and 1916 the approval of the fishermen was secured and the governments were petitioned for international action.

At this time there appeared three reports by the British Columbia Commission of Fisheries (Thompson 1916, 1917), one dealing with the life history of the halibut, one with the statistics of the fishery, and a third with protective measures with particular reference to the closed season. The studies of life history showed that the spawning occurred during the winter months and that the fish was of slow growth. The statistics proved definitely, for the first time, the decline in abundance and average size of the halibut on the older banks, together with longer voyages and more effort for the returns. These studies gave scientific support to the movement for closure, from the standpoint of conservation, which was the main reason urged publicly for passage of the desired legislation. The final report urged that three months' closure would not suffice and would simply

intensify the summer fishery on the most depleted banks, those off British Columbia.

As a result of the move for closure, a bill was introduced into Congress, February 21, 1916 (S 4586 by Johnson of Maine, see Appendix). This bill provided for a closed season, but also provided for the closure of a nursery ground near Cape Addington in Southeastern Alaska, which had been suggested by the Fishing Vessel Owners' Association to prevent the capture of very small fish. By its terms it was to be put into force in case there was concurrent action by Canada to the same end. This bill passed the Senate, but failed in the House. These measures, especially the closed season, met with universal approval.

Again, in the support this bill secured, it was evident that the purpose of closure was very frankly primarily economic. In resolutions and public statements more and more reference was made to the necessity of preventing depletion, since it was evident that this was one of the strongest reasons for action. To quote from the Pacific Fisherman of January, 1916 (p. 1), regarding the closed season: "This was more for the purpose of reducing the catch than anything else, as the enormous increase in the fleet and the establishment of new cold storage plants had caused an over-supply of fish, with the result that prices dropped to a low ebb and all were losing money." Again, in the February, 1916, issue of Pacific Fisherman, a letter from the Skeena River Fishing Company was noteworthy. It gave as reasons for approval that the fish were spawning. It stated that the company had not operated its own schooners in winter, and that closure would eliminate the costs and risks of operation while it would stimulate the frozen fish business. A letter from a Portland dealer, influenced probably by relative detachment from the fleet, urged that the closure be long enough to really restrict, and suggested four months instead of two or three, saying that the halibut fishery could be protected by fewer engaging in the business. It would seem, indeed, that from the earliest mention of the closed season the dominance of economic reasons for protection was plain.

The subsequent history of the movement can be followed in outline. Governor Strong of Alaska urged the closed season. The United States-Canadian Joint Commission in its hearings had the case for closure strongly presented to it, and as a result the proposed halibut treaty of October, 1919, was submitted for approval to the two countries. The existence of provisions in this treaty dealing with the reciprocal port privileges led to vigorous objection on the American side. And at the same time the halibut treaty was under consideration, in January, 1920, a bill was introduced again (H R 3618) providing solely for a closed season of two months, with a closed nursery area. In the years following 1920 the pressure for action in regard to closure alone steadily increased. A remarkable evidence of the attitude toward this closure was the action of the American Vessel Owners, who in the winter of 1921-22 proposed a voluntary closure of halibut fishing from January 10 to March 15. This closure was carried out by some 20 large schooners, but not by any others, nor, especially, by the smaller vessels. The period was largely occupied in refitting and was more a gesture than a limitation.

A Royal Commission investigating the fisheries of British Columbia during

1922 had laid before it by various members of the trade strong argument for the adoption of winter closure. In this, great emphasis was laid upon the necessity of conservation.

Freed of all embarrassing provisions, a new treaty was formulated in 1922 dealing solely with closed seasons and with the establishment of an International Fisheries Commission for investigation of the halibut. This treaty was signed in March of 1923, but met with several legal complications in passage through the Senate. It was approved by the Senate with the proviso that its terms should be extended to all British nationals, whereas the treaty was signed in its original form as applying to Canadians only. In the meantime the Canadian Government, having signed the treaty without the Senate amendment, passed a halibut enforcement act, containing among other provisions one which was objected to by the Americans. Approval by the United States Senate was withheld pending the repeal of Section 9 of the Canadian Enforcing Act. In May of 1924 this section was repealed. In June the halibut treaty was ratified by the United States, without the former amendment; an enforcement act was passed, and in November of 1924 the first closed season, under the new treaty, began.

TARIFF OF 1922

The treaty, however, left untouched the economic relationship between the two countries. Following the cancellation of the wartime agreement, the passage of the United States Tariff Act of 1922, which restored or increased the duty on many kinds of fish, including a two cent per pound duty on fresh or frozen halibut, had caused many protests from Canadian interests, with demands for retaliation. These included such proposals as the institution of a tonnage tax on American landings in Canadian ports and the complete abrogation of the *modus vivendi,* with the closure of Canadian ports to American vessels. Such retaliatory measures have not been put into effect.

The placing of fresh or frozen halibut upon the free list by the United States in 1913 had stimulated the growth of the Canadian fleet. To what extent this stimulation had been affected by the course of the war is a question we cannot enter into. But during the years 1920 and 1921 the fishing industry of all nations was in a severe depression, and this may have prevented any great change in the Canadian fleet. Nevertheless, when in 1922 the United States tariff imposed a duty of two cents per pound on fresh or frozen halibut, the effect was immediately felt by the fleet of Canadian boats that had grown up at Prince Rupert during the period of free entry.

This tariff was, therefore, of considerable importance, and has tended naturally to confine the Canadian fleet largely to its own market. Considerable doubt arose as to the exact meaning of this tariff. In 1922 its terms were interpreted by the Treasury Department of the United States to mean that fish frozen or held in storage in a Canadian port would be held dutiable unless handled and owned by the master or fishermen themselves, which would have severely handi-

capped the American fleet landing in Prince Rupert. Such duties were accordingly collected unless fish were shipped fresh on ice immediately after landing. But under ruling of March 27, 1924, the free entry of such frozen halibut was permitted in bond if not salted, dried, etc. The threat to the landing of American halibut at Prince Rupert was therefore removed, although the two cent duty on Canadian fish was still imposed.

The details of the controversies which have arisen over the bonding privilege and over the American tariff are hardly pertinent to the purpose of this publication. Suffice to say that no extensive transfer of American vessels has occurred, that Prince Rupert has not been closed, and so has not hindered the exploitation of the banks, and that the effect of these controversies has been felt mainly within the trade.

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