

A HISTORY OF THE SALMON INDUSTRY
IN THE PACIFIC NORTHWEST

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by

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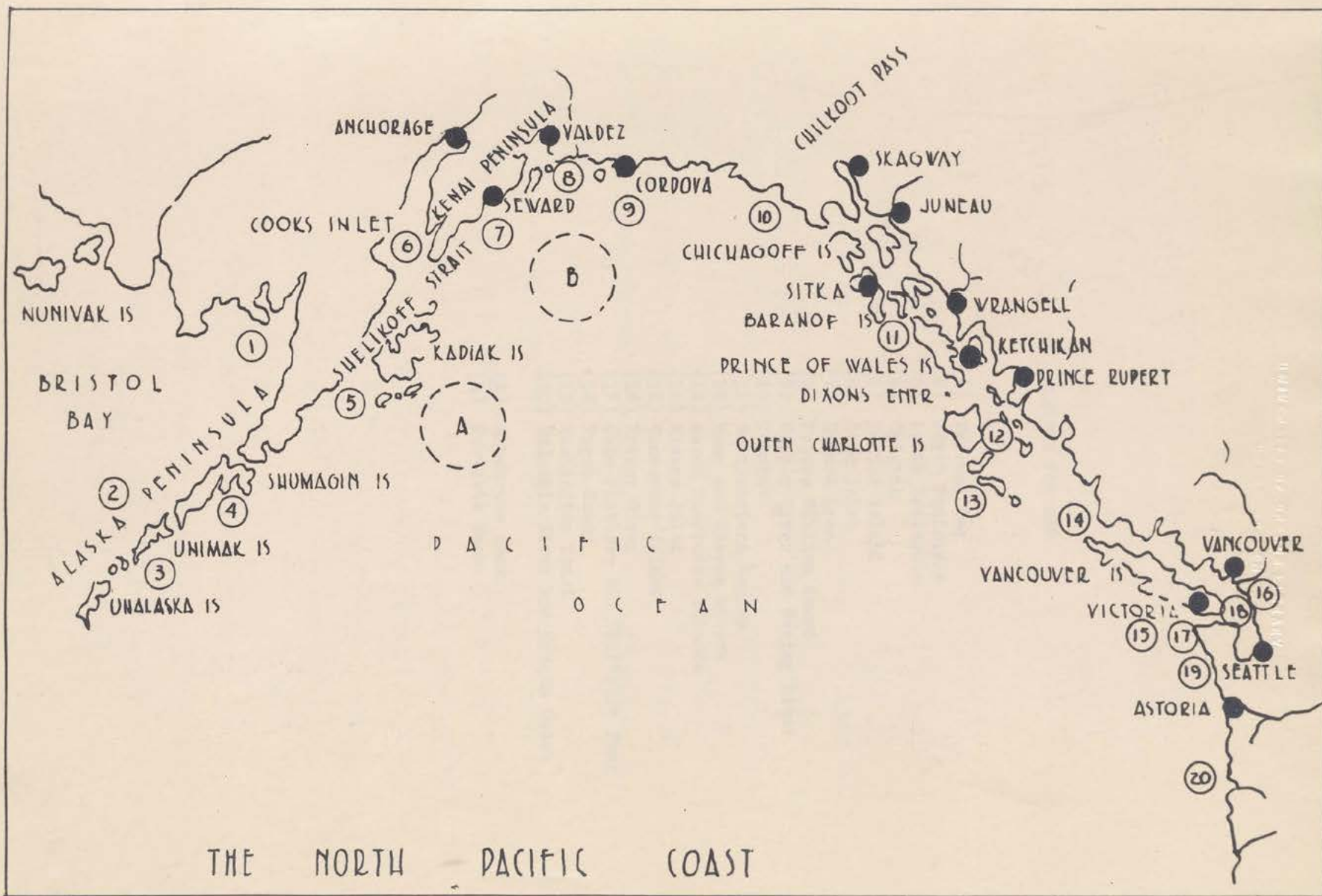
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INTRODUCTION

And God said . . . let them have dominion
over the fish of the sea.

GEN. I. 26

Nowhere but from the sea can so much food be obtained with so little effort. The fisherman, if he exercises moderation need not sow nor cultivate to reap a bountiful harvest.

To the casual observer the sea with its excess of a hundred million square miles may seem only a barren waste, at best serving as a medium for transportation, the source of rainfall, or perhaps as a fortuitous but fortunate barrier against invasion. Yet beneath its bleak surface the ocean nurtures infinitely more life than can be found on land. Of the fish alone there are an estimated nineteen thousand species, many of them almost incomprehensibly abundant. The herring fishery of the North Sea has been exploited commercially for nearly a thousand years, yet more than a billion herring are still taken annually. True, some areas and some species are overfished, but others are neglected and, in general, the world's fisheries still remain capable of great development. Accordingly it is more than likely that they will continue, as in the past, to contribute materially to man's economy and man's destiny.

For the harvest of the sea has provided a significant portion of the world's food supply in all ages. Both the past and the present bear witness to the existence of populations largely dependent upon the fisheries. Though overshadowed by agriculture, this industry has been

vital to the broadening of man's horizon.

In the long line of maritime genealogy and exploration the fishing boat is the forerunner from which all vessels have come. The earlier seafarer did not seek trade over the sea. The business of a hunter called him forth. The staunch and sometimes handsome vessels engaged in fishing today are far removed from the dugouts or even the built-boats of early days, but the quest is much the same--a wandering course over the salt waters to seek a livelihood in the deep.

Undoubtedly the fleets of the Phoenicians and later of the Greeks found their beginning among the hardy hungry men who first ventured to the fishing grounds of the eastern Mediterranean. Only after fishermen had observed the set of winds and tides did the greatness of Sidon and Tyre as trading centers become possible.

On the coasts of the Mediterranean the tunny, one of the largest and fattest of food-fish abounds. Through the Bosphorus, Propontis and Hellespont have come great shoals of these fish, and some weigh as much as four hundred pounds. Consider their value in a land which at best supported scant forage for skinny cattle and goats. It should be apparent, then, why the Greeks learned to kill them so skillfully and in such numbers that Aeschylus in the Persae could make vivid to his Athenian audience the slaughter of the Persians at Salamis by comparing them to a school of tunnies driven into the shallows and speared.

And is it not likely that the earlier Greeks looked northward beyond the islands toward the straits whence the tunnies came--and in a

season when the tunnies were late would not their curiosity be edged with hunger? Accordingly the first explorers of the Euxine were probably not the publicised Argonauts of Jason, but rather a crew of lean-bellied, sunburned fishermen who impatiently inched their boats along beneath strange cliffs, their nets carefully flaked and bronze harpoons at hand as they toiled at salty oars.

Beyond the Pillars of Hercules and stretching to the North Cape the fisher-folk of the Western Ocean struggled with the harshest of seas. There, every sudden change of wind was the harbinger of bad weather and always they contended with the tides and currents which so baffled and terrified those Ancients possessing the initial hardihood to venture from the tideless Mediterranean. When Caesar arrived on the coast of Brittany, which to this day fosters sturdy fishermen, he was struck by the superior seaworthiness of the boats of the open Atlantic over those he had known at home. Ancient craft preserved in the blue clay of either side of the North Sea reveal that Caesar had an eye for a good boat.

In subsequent centuries the fishermen of the north further refined their vessels and seamanship as they ventured increasingly greater distances at sea in search of food. The long, hard trip by sail and oar to the banks on windy seas encouraged improved sailing techniques as well as better ship construction. Some observers trace a close affinity from the lines of viking ships through the distinctive fishing craft of Norway to the Columbia River gill net boat used on rivers and bays from

Oregon to Alaska, and which, more or less modified, goes upon the open sea as a troller. The fact that the Norsemen, the greatest of fishermen and sailors, built the first vessels capable of a midwinter voyage across the North Atlantic is known to all.

In ancient times and down through the Middle Ages the fisheries were often relatively more important than they are today. Despite the fact that the number of fish taken was then less, agriculture in the middle ages was often relatively inefficient, manufacturing and commerce were in the stages of development, and medieval man was more dependent upon sea produce.

Medieval Englishmen, Frisians, Flemings, Normans and Bretons gathered upon the Dogger Bank, a North Sea submarine plateau nearest the coast of England, to take the herring, haddock and cod. Upon this no man's land where the fishing fleets of nations assembled it was every man for himself. Clashes were frequent and piracy was chronic, but out of a long period of bloody violence there evolved a code of rights which the growth of maritime trade and the development of stronger government nurtured, with the sanction of old Roman law, into the germs of the doctrine of freedom of the seas.

The fisheries have, indeed, played an increasingly important role in international affairs. The failure of the herring in the Baltic Sea after about 1425 resulted in an economic and political readjustment in northern Europe. Disputes over fishing rights have long since echoed in the tramp of armies and the crash of naval broadsides. One of the

conditional factors in the enmity between France and England leading to the Hundred Years War was the dispute over North Sea, Channel and Bay of Biscay fisheries. Also, in 1348, when the Danes had imposed a duty on herring, they discovered that the Hanseatic cities regarded it as a matter calling for war. All during the seventeenth century the English and Dutch were at odds over the North Sea fisheries and not the least significant cause of the so-called French and Indian War was the struggle between England and France over fishing rights off the North Atlantic coast of America.

The present century has witnessed bloody incidents involving Russian and Japanese fishermen off the Siberian coast and the island of Sakhalin. On this side of the North Pacific, Canada and the United States have quarreled regarding their overlapping fishery interests, but rather than resort to violence they have lent new precedent to international law. The principles of arbitration and cooperation through an international commission have been established by the two countries through the International Fisheries Convention of 1924. This is also notable as the first treaty entered into by Canada as a nation, and especially, as the first agreement anywhere having as its object the preservation of a high seas fishery. This precedent making treaty, involving the off-shore halibut fisheries, has recently been supplemented by another concerning the mutual interest of Canada and the United States in the sockeye salmon runs of the Juan de Fuca Strait--Puget Sound--Fraser River region.

Americans on either side of the border owe much to their fisheries.

Early settlers in New England and in the Maritime Provinces of Canada might have starved had it not been for the productive fishing grounds off their shores and the presence of excellent boat-building timber. These fisheries with their later counterparts on the Pacific Coast have had, and continue to have, great effect on American food-habits, trade, population and enterprise. Those who fished on the North Atlantic, and as far as the Grand Banks, invented the schooner, the swiftest of all sailing vessels and the most efficient at working into the wind. The exigencies of the physical setting of American fisheries and the fact that they have attracted the best of fishermen from both northern Europe and the Mediterranean has conspired that most efficient boats and gear should here be devised from the combined heritage and experience of foster sons. This is probably best exemplified by the purse seine boats as developed on Puget Sound. The lines of the vessel are a happy compromise between north and south European concepts; the idea of the seine is said to have been introduced by the Chinese, and the crew may be either Norwegian or Jugo-Slavian. Within the past two years one of these boats made the long trip through the Panama Canal and invaded the Grand Banks fisheries with notable success. American technological improvements have more than once been carried back to Europe and the Orient with the result that the world's fisheries have been greatly expanded.

And herein, from the effect of technological improvements in the techniques of catching, preserving and transporting fish lies the crux

of the problems facing the fishery industries today, especially as regards the salmon of the Northwest Coast of America. The comparatively recent development of the gasoline motor and the lighter kind of Diesels enables the individual fisherman with a moderate outlay of capital to strip the seas on a scale hitherto without precedent. Moreover, these same developments supplemented by others in the hands of capitalism and corporate enterprise have militated for the organization of great companies such as those exploiting the Alaska salmon fisheries. By means of expensively placed traps of deadly effectiveness scores of thousands of fish are caught each day and rushed by fleets of Diesel-powered tenders to marvelously efficient canneries there to be processed and set aside in gleaming acres of tin--all within twenty-four hours since the fish swam free, impelled toward his ordained spawning ground. In the cans they wait only an eight or ten thousand ton freighter, which the company may also own, before they are taken to Seattle or San Francisco and judiciously released to the distant consumer through an intricate and efficient system of marketing and internal transport.

Now, while nations grapple with the difficult problem of insuring the perpetuation of certain of their fisheries in the face of their own exploitation, they find the problem compounded by invasions, technologically fostered, from nations not previously concerned in a specific area. Thus, in 1937, when the British owned, Norwegian manned, refrigerator ship Thorland projected operations on the North Pacific halibut banks, sharp protests from the United States and Canada led to cancellation of the venture--at least for the time. In that same year

"encroachments" by Japanese cannery ships in the salmon fishery of Bristol Bay in western Alaska so excited packers and fishermen that the State Department instituted a spirited diplomatic exchange with Japan. The Japanese, "without prejudice to the question of rights under international law", gave assurance that they would "suspend" operations in the Bristol Bay area.

These threats to fisheries which Americans and Canadians had regarded as their own led many to seize upon the idea of extending national jurisdiction beyond the established three miles and as far as the limits of the continental shelf. In the case of the Bristol Bay salmon fisheries, the attitude in the United States harked back to a claim made early in the fur seal controversy that the Bering Sea was a mare clausum. Accordingly, the year 1938 found Congress considering bills designed to reserve the salmon of Alaska for American exploitation alone by extending the jurisdiction of the United States over the sea to distances established by the continental shelf or by the hundred-fathom line. Though none of these bills were carried, the incidents inspiring them and the sentiment for their support became another factor in the nation's jettisoning of its long revered and erstwhile vigorously defended doctrine of the freedom of the seas. Moreover, the incident as a whole serves to reiterate the fact that a fishery which is outwardly purely regional in its effects may have, and usually does have, effects and repercussions not only national but international in scope, and which in turn may lead to a reorganization of the particular industry and to a recasting of the cultural outlook.

This study, then, will constitute an investigation of the history of northwestern America's most important fishery. Certain of its problems and events which have proved pertinent to the history of Oregon, Washington, British Columbia, and Alaska, as well as to that of the larger social, economic and political patterns of which they are an integral part, will not be neglected.

In accordance with nature's arrangement of marine life for this coast and because of the palates she has given men, the salmon have sustained the greatest fishery in the region and, indeed, now support the most valuable fishery in America. As such the industry is treated here. The history of salmon fishing techniques will be included and discussed in detail because the writer has had some experience in their use both in the coastal states and Alaska. In any case the "how" of human enterprise would seem to reveal much about the "what" and the "why".

CHAPTER I

BACKGROUND OF THE SALMON INDUSTRY

For as Geography without History seemeth a carcasse
without motion, so History without Geography wandreth as
a Vagrant without a certaine habitation.

John Smith, Generall Historie of Virginia

European peoples, like the natives they dispossessed, occupied the northwest coast of America by settlements grouped socially and economically and distributed in conformity with the conditions imposed by the physical setting and the natural resources. Yet this correlation between human society and geography must not be over-simplified; for, although it is true that economic activities are largely inspired and localized by the immediate possibilities of the surrounding area and its capacity for the production of food and raw materials--its wealth in furs, metals, fish or timber, and by the advantages of its location with respect to markets and facility of transportation, it is also true that these activities are very significantly governed by the peculiar genius of the people themselves and by their political organization. Thus American and Canadian free enterprise long struggled over certain of these raw materials with the monopolistic Hudson's Bay Company in the region now included within the confines of Oregon, Washington and British Columbia. Likewise American cod fishermen and pelagic sealers were at odds with the Russian-American Company in what became the American territory of Alaska.

These companies had only an incidental interest in the fisheries

and not until the first had lost its charter and the second its existence did the fisheries, abetted greatly by improved processing, more adequate transport and a broader market, become a major industry of the region.

Pacific salmon--the raw material of the major fishing industry of northwestern America--are confined to the temperate and arctic waters of the North Pacific Ocean, within limits apparently established by ocean currents and the associated temperatures and salinities.¹

Though salmon are spawned in streams on both sides of the Pacific the American pack has greatly exceeded that of Asia. The Alaska pack alone now accounts for well over half the world's production of canned salmon.²

On the American continent the salmon run in varying but generally increasing degrees of abundance in coastal streams from the Ventura River in California northward to Kotzebue Sound in the Bering Sea. At least one species, the chum, is believed to spawn in the Mackenzie River of arctic Canada, and the existence of a run in the northward-flowing Lena River of Siberia has been established.³

From this northernmost point on the Asiatic mainland the salmon

1. Frederick A. Davidson and Samuel T. Hutchinson, Geographical Distribution and Environmental Limitations of the Pacific Salmon (Genus *Oncorhynchus*), 1938, U. S. Dept. of Commerce, Bureau of Fisheries, Bulletin No. 27 (Washington, 1938) pp. 668, 674.

2. Pacific Fisherman, 1940 Yearbook, tables pp. 65-84.

3. Davidson and Hutchinson, op. cit., p. 668.

range southward to the Tumen River of Chosen. The Japanese archipelago from northern Houshu through Hokkaido, Sakhalin and the Kuriles likewise is the scene of important runs.

Since Pacific salmon live alternately in different environments--fresh water and salt--since they spawn but once and die, and because their highly developed homing instinct leads them to return "predominantly to their home streams",⁴ biological factors have joined the geographical ones in governing the form of the industry.

Moreover, because salmon on their migration to the spawning grounds cease feeding soon after they enter fresh water and grow rapidly poorer in quality as they ascend the streams, they should be caught as near the sea as possible. But should they be taken in destructive numbers, or should those which escape the fishermen find their upstream progress too much slowed in the face of constantly dwindling energy by other man-made obstructions, the numbers which finally reach the gravel spawning beds at the headwaters will be insufficient for the maintenance of a profitable run. Hence, both the fishing gear and the conservation measures are to be conditioned accordingly. Because salmon return in preponderant numbers to the home stream, the gear plus conservation equation, when applied in a given stream, will pay dividends in proportion to the values assigned the two factors.

For the reason that salmon are better food the nearer tide water

4. Forest Ray Moulton, editor, The Migration and Conservation of Salmon, Publication of the American Association for the Advancement of Science, No. 8, (Lancaster, Pa., The Science Press, 1939) p. 49.

they are caught, because the industry ranges geographically on a narrow strip of coast through twenty degrees of latitude, and since neither the increasing speed of modern transportation nor the declining cost of refrigeration has, in any great measure, overcome the dictates imposed by the extremely perishable nature of the fish, the salmon industry developed, and in general remains, widely dispersed along the coast and centered in a great many canneries close to the sources of supply.

Despite the advent of motor-powered trolling and purse-seine boats which effectively fish upon the open sea, the nature of the salmon still confines the fishing season to the comparatively brief period of the salmon runs. Moreover, governmental regulation in furtherance of good conservational practice has generally shortened still more the period in which salmon may be taken and has joined nature in conspiring to make the industry highly seasonal. The employment of labor, the financing and organization of the short season's work at a more or less remote cannery, and the marketing of the finished product have all been affected accordingly.

Many canneries, especially those in Alaska, have necessarily been situated in an area which provides neither a local population for seasonal labor nor many of the secondary materials for production and, least of all, a market. Over and above all other limiting factors, the industry has often been forced to wait the pleasure of the weather before embarking upon the seasonal race to move hundreds of men and thousands of tons of equipment onto location in preparation for a fishing season lasting but six weeks. Again when the season has passed,

the reverse movement has been complicated by the hundreds of thousands of cases of canned salmon to be transported to centers whence they could more easily be distributed.

Necessarily, then, the industry has established its headquarters in the larger cities of the Pacific coast, perhaps two thousand miles from its production plants, but where labor and finance were concentrated and where water-borne and inland transport met. Seattle, therefore, became the base for the salmon fisheries of that part of the Puget Sound region within the jurisdiction of the United States and also for the more important Alaska industry. The latter, however, has been shared with San Francisco. Astoria on the Columbia River and the historic center of the salmon industry is joined by Portland in dominating still, a very significant fishery in its own area and engaging in the Alaska enterprise. Vancouver, British Columbia, became the center for the very important Canadian share of the industry.

It has been indicated that much of the salmon fishing is conducted either amidst conditions approximating those of salt water or upon the sea itself. It is a common observation that the sea exacts a long and strict apprenticeship from those for whom it provides a livelihood. Here again the salmon industry has marked the regional labor and population quite apart from effects incidental to its seasonal character. Most of the native-stock settlers of the Oregon country emigrated from the Ohio valley.⁵ They were, of course, quite unfamiliar with the sea.

5. Edna C. Spenker, Eighty Years of Population Changes in the State of Oregon, (Unpublished Master's thesis, The University of Oregon, Eugene, 1933), Chapter XIII.

British Columbia also was probably settled largely by immigration from Upper Canada although perhaps with a greater admixture from maritime regions. Naturally, most settlers of native stocks in their new homes engaged in enterprise to which they were more accustomed, and the fishermen were drawn, for the most part, from the Indians and such North European immigrants as had been familiar with fishing in the North Sea and the Baltic.⁶ Native immigrants from New England and from the Canadian maritime provinces did, however, provide Americans experienced in the fisheries and it was these who for a generation or more tended to be the entrepreneurs of the industry.

In Alaska at present the fisheries account for 22.5 per cent of the local population gainfully employed and in this respect that industry stands at the top of the industrial list.⁷ Foreign-born whites from the Scandinavian countries and Finland constitute slightly more than fifty per cent of the white population of Alaska,⁸ and the town of Ketchikan, probably the most typical of Alaskan fishing centers had, according to the 1930 census, a foreign born population of 1,039, of whom 550 came from Norway alone.⁹

6. J. W. Collins, "Report on the Fisheries of the Pacific Coast of the United States", United States Commission of Fish and Fisheries, Report of the Commissioner, 1888, 51st Cong., 1st Sess. H.R. Misc. Doc. No. 274, pp. 177, 233.

7. U. S. Dept. of Commerce, Bureau of the Census, Fifteenth Census of the United States, 1930: Outlying Territories and Possessions (Washington, 1932) pp. 21, 27.

8. Ibid., p. 21.

9. Ibid., p. 24.

In the canneries the skilled labor has been performed by whites and the fishing itself performed almost exclusively by whites or Indians. In Monterey Bay in California and in British Columbia a comparatively few Japanese do, however, yet fish for salmon. In the days before the motor boat, there were a few Chinese engaged in the gill-net fishery of the Columbia River and the purse-seine fishery of Puget Sound. Among the share workers, however, the cannery operators found it expedient at a very early date to largely replace the unskilled white labor with Chinese.¹⁰ When this supply of cheap labor dwindled after the Chinese exclusion act, it was gradually replaced by Japanese. Since these in turn have been excluded, Filipinos have come to predominate among Oriental workers in the canneries under the jurisdiction of the United States.¹¹

Here, then, has been sketched something of the setting, the effects, and the problems of the greatest salmon industry of the world. Before proceeding with a history of that industry and a more detailed treatment of certain of its aspects, a discussion of the nature of the salmon and the techniques of their capture and preservation will be undertaken.

10. Collins, *op. cit.* See the tables presented for each fishing area regarding nativity and nationality of workers.

11. Ward T. Bower, Alaska Fisheries and Fur-Seal Industries, (annual), 1937, U. S. Dept. of Commerce, Bureau of Fisheries (Washington, 1938), p. 107.

CHAPTER II

THE RAW MATERIAL OF THE INDUSTRY

Marvel how the fish live in the sea.
William Shakespeare, Pericles

The five species of Pacific salmon were properly classified before a single American had reached the Northwest coast. In 1731, George Wilhelm Steller, a German scientist travelling in Siberia and one Krascheninikov, a Russian, independently but almost simultaneously cataloged them with accuracy under the genus Oncorhynchus and distinguished the species by their Russian vernacular names. Another German, Johann Julius Walbaum, subsequently (1792) adopted these names into scientific nomenclature.¹

Other writers, and through the nineteenth century, listed as many as twelve species,² perhaps largely as a result of the various popular names applied to the same species in different localities on the coast, and also because the males undergo a radical change in appearance as the spawning season approaches. Indeed some fishermen remain unconvinced of the complete accuracy of the scientific classification, and it must be stated to their credit that investigation does reveal common

1. John N. Cobb, Pacific Salmon Fisheries, U. S. Dept. of Commerce, Bureau of Fisheries, Fisheries Document no. 1092, (Washington, 1930), p 411.
2. Collins, op. cit., pp. 200-201. See also Fifth and Sixth Annual Report, Fish and Game Protector of Oregon, 1897-1898, p. 81.

but slight structural differences between, for instance, the chinook or king salmon of different rivers and even, as some insist, between the early and late runs of that species in the same river.³

The steelhead trout, belonging to the quite distinct genus Salmo,⁴ is classed by many fishermen as a salmon and quantities are taken commercially with salmon gear (especially in the Columbia River) over a range approximating that of the true salmon on the American side of the Pacific.⁵ For those reasons it will be included in this discussion.

3. Lionel A. Walford, Marine Game Fishes of the Pacific Coast from Alaska to the Equator, (Berkeley: The University of California Press, 1937), p. 152.

4. The steelhead, a sea-going rainbow trout, like the Atlantic salmon of the same genus but, unlike the Pacific salmon, does not necessarily die after spawning.

5. The steelhead cannot be taken legally in California except by hook and line.

TABLE I
SCIENTIFIC AND LOCAL NAMES OF PACIFIC SALMON

Scientific Name	Puget Sound	Columbia R.	Alaska	Others
1. <i>Oncorhynchus Tschawytscha</i>	Spring King	Chinook Spring	King	Tyee Quinat
2. <i>O. Nerka</i>	Sockeye	Blueback	Red Sockeye	Quinalt Redfish Lake salmon Benimasu
3. <i>O. Kisutch</i>	Coho Silver	Silver	Coho Medium red	Silverside Hoopid Skowitz Blueback
4. <i>O. Gorbuscha</i>	Humpback Pink	Humpback Pink	Hump- back Pink	Haddo Holia
5. <i>O. Keta</i>	Chum	Chum	Chum	Dog Keta Hayho Calico Lekai
<i>Salmo Gairdneri</i>	Steelhead	Steelhead	Steelhead	Salmon trout Hardhead salmon

The total North American catch of these species for the year 1937 (including British Columbia) amounted to 858,246,600 pounds. The value of the salmon marketed in that year totaled \$29,217,905. This figure is not, however, exactly representative of the catch of the same year nor is it the value of the finished product for it applies only to the raw fish price.⁶

The salmon catch of the Pacific states and Alaska for 1937 put the industry in second place among all the fisheries of the United States with respect to volume and in first place with respect to volume and in first place with respect to value. Moreover, the value of this 1937 pack of salmon represents more than one-third of the value received from all fisheries of the Pacific states and Alaska. The latter area, even in a poor year, accounts for four-fifths of the volume of salmon packed in United States territory.⁷

Salmon accounts for three-fourths of the total value of British Columbia fisheries and is chiefly responsible for making that province the Canadian leader in value of fishery products.⁸

6. Homer E. Gregory and Kathleen Barnes, North Pacific Fisheries, (San Francisco: The American Council of the Institute of Pacific Relations, 1939), pp. 10-11.

7. Ibid., p. 11.

8. Loc. cit.

The total North American canned salmon pack in terms of cases and by species for the decade prior to 1938 follows:⁹

	Total Cases* (average for the decade prior to 1938)
Chinook	352,472
Sockeye	2,412,285
Silver	525,580
Pink	3,926,253
Chum	1,276,337
Steelhead	17,737

*For statistical purposes cases are ordinarily reduced to a basis of 48 one-pound cans.

Since the species vary not only in total abundance for the whole area but also as between localities, since they exhibit different physical characteristics and enjoy various degrees of favor with the consuming public, and because nature or the law may impose different types of gear in catching them, a somewhat detailed account of their habits and differences is indicated.¹⁰

CHINOOK OR KING SALMON

The chinook is the largest of the five species and brings the highest price per pound whether sold fresh or in cans. Its size and

9. Source: Pacific Fisherman, 1940 Yearbook, p. 65.

10. Publications of the U. S. Bureau of Fisheries and other scientific works are available in this connection. David Starr Jordan, Charles H. Gilbert, F. M. Chamberlain, E. L. Goldsborough, Frederick A. Davidson and B. W. Everman are authorities associated with biological studies of salmon.

the superiority of its flesh in texture and in flavor caused it to be the first species canned. The deep red color of the flesh common to the specimens from the Sacramento and Columbia Rivers established in the mind of the consuming public a prejudice against the lighter colored flesh of other species. Today, however, the chinook is canned less than others, most being sold in the frozen, mild-cured or fresh state.

It is caught from Monterey Bay in California to Norton Sound in Alaska and on the Asiatic side of the Pacific as far south as Chosen. Some streams have three distinct runs each year, as in the case of the Columbia River where it is of greatest commercial importance, while other streams have but one. In Puget Sound, British Columbia and Alaska it may be taken in the inlets throughout the year. The chinook of British Bay are usually caught in June and July. The gradual shift northward of the salmon industry caused this species to lose its dominant position in the canned-salmon trade to the more abundant and almost equally desirable sockeye.

Some chinook have attained enormous size, one reported from Wrangell, Alaska, in March, 1940, weighed 125 pounds. Individual fish which double the average of about twenty-two pounds are, however, likely to excite comment.¹¹ These fish are subject to a curious local variation which

11. In August, 1938, on the west coast of Prince of Wales Island, Alaska, the writer caught a specimen weighing seventy-two pounds on commercial trolling gear. At the local fish buyer's scow it brought twenty-one cents a pound which amounted to a good wage for that day from a single fish.

remains unexplained. In certain localities such as Puget Sound, southeastern Alaska and Bristol Bay, as many as one-third of those caught may have a clear white flesh in place of the usual deep red, with the result that they sell at reduced prices despite the fact that they appear equally rich in food value. Indeed the Alaska Indians seem to prefer these white chinook.

The chinook begins life from four to six months after the eggs were deposited on the fine gravel in some clear mountain stream the previous summer or autumn. As soon as the attached yolk sac is absorbed, the young are able to swim freely, and in the spring the majority will begin the long and hazardous journey to the sea. Some, perhaps a third, remain in fresh water for their first year, and these will never catch their more impatient brothers in weight. The migrants reach the sea by early fall but linger in the estuaries, moving back and forth, and feeding with the tides. Eventually they enter upon their oceanic life, and since there is more food in the sea than in fresh water, they grow rapidly and at the same time assume the metallic-green, rose, and silver coloring with the round black spots which makes them display to such advantage on ice beneath the butcher's glass case.

Individuals of this species range widely.¹² Some tagged in the Columbia River have subsequently been caught as far south as San Fran-

12. It was long thought that salmon spent their life in the sea close to the stream which had nurtured them. They are now believed to range anywhere along the continental shelf but as to whether they go farther is largely a guess.

cisco and as far north as Alaska. The food of the chinook in the sea consists of live organisms, herring, smelt, small tom-cod, and myriads of the tiny crustaceans with which the areas of "green water"¹³ off the coast abound.

The majority of chinook mature sexually in their fifth year. For some precocious males, however, this may happen at the end of the first or second year while some obstinate cases linger at sea for seven or eight years.

In the males, maturity is marked by the silver coloring being replaced by a greenish black which may later become blotched with spots of red. The jaws become greatly prolonged and the nose hooked or twisted until occlusion is often impossible. Receding flesh leaves the teeth protruding to a length of five-eighths of an inch. Cartilaginous structures of the jaws and the entire flesh of the fish grows less firm. The back develops a hump, the body narrows, and a spongy growth may cover the receding scales.

The female likewise suffers in color, and her scales become embedded beneath a coating of slime. All these changes are scarcely noticeable in the beginning but become more pronounced as the season advances, and especially after the fish have been for some time in fresh water.

On the spawning migration they appear to enter the streams on a

13. Since tuna fishing has taken Oregon and Washington trollers farther at sea, they have discovered that salmon are more prevalent in "blue water" areas than was once believed.

flood tide in daylight hours, coming in schools that grow numerically greater to a maximum and then recede less gradually. Fishermen believe, however, that a sustained period of rainfall at this juncture may bring most of them in at once.

At sea the chinook was only the prey of other marine life and also of trolling boats for it is one of the two species which ordinarily strike at a lure. In certain sections, notably in Alaska, traps, purse seines and gill nets operating beyond the shore line may have also decimated his numbers as he fed in the sea. But it is in fresh water where most of them cease eating, after lingering for a time in the estuaries and when they must draw upon stored energy, that their hazards are compounded. Gill nets and traps again, drag seines, whip seines, fish wheels, dip nets and an army of sportsmen may all exact heavy toll as the fish swims his three or four miles a day toward the headwaters. There the survivors finally arrive, starved, suffering from parasitic growths and, perhaps, with an eye lost or the nose worn away. Their bodies may be gashed and raw from contacts with fish gear, from leaps up dams and falls, and from fighting with one another.

The males and females pair and in gravel, in swift water, not more than four feet deep nor with a temperature exceeding 54 degrees F. both male and female join in excavating the shallow nest. Eggs will then spurt from the female while the male exudes upon them his milt. The spawning act may require two days and possibly more. The vast majority of salmon will then very shortly die of exhaustion but, if some thought-

less sport-fisherman, who would like to vote all commercial fishermen out of a livelihood doesn't come blundering along with his fly rod and wading boots, there is a good chance of their eggs hatching and of the cycle being repeated.

THE SOCKEYE OR RED SALMON

For many years the sockeye has outranked the chinook in commercial importance and it commands the next highest price. The maximum weight is around twelve pounds, but the average weigh about half that. Like chinook, and as one of its names would imply, it also possesses a deep red flesh.

This species is of commercial importance only as far south as the Columbia River where it is locally known as the blueback. Until serious over-fishing in the Straits of Juan de Fuca, Rosario, and Georgia had combined with a great landslide which closed the Fraser River in 1913-1914 and which blocked them from their chief spawning grounds in that region, the Fraser River was most "famous for its enormous runs of this species, . . . a peculiar feature of which is, that there is a marked quadrennial periodicity in the run. The maximum occurs the year following leap year, the minimum on the year following that."¹⁴

Though the sockeye is found in most of the streams from the Columbia River north to arctic waters, the greatest catches are now made in Bristol Bay, Alaska.

14. Cobb, op. cit., p. 413.

In life history it differs little from the chinook. The fry may go to sea in either the first or second year, and it normally matures in either the fourth or fifth year with much the same physical changes. In one respect it is peculiar among salmon in that it usually runs in streams originating in lakes. Some, indeed, are found in land-locked lakes and such fish are invariably smaller than their less circumscribed fellows.

Almost the entire sockeye catch is canned. Rarely, if ever, does this species strike a lure, but it may be taken with any other form of gear. However, because nearly all appliances except gill nets are forbidden in the region where it is most prolific, that method accounts for most of the catch. The majority are taken during July and August.

THE SILVER OR COHO SALMON

The silver, except that it normally spawns a year earlier, resembles the chinook in habits and in outward appearance to a greater degree than do other species. The flesh is lighter than that of either of the salmon yet described and brings a lower price. From July to October it runs in most of the streams along the coast. Like the chinook, it, too, will strike a lure and thus may be taken by all forms of gear, though it is said to be, of all species, the most wary of nets. Proportionately greater numbers of silver than of chinook are canned but the greater part of them also find their way to market fresh, frozen, or cured.

PINK OR HUMPBACK SALMON

The pink, with its smallest average weight of but four pounds is also the most abundant of salmon and ranges farther south than other species. Rarely, however, is it found in any great numbers south of Puget Sound. There, and to a lesser degree in other areas, it like the sockeye "exhibits a marked periodicity" in its runs which occur on alternate years; for, in life history, this species differs chiefly from the chinook in that the fry all go to sea the first year and return in the second to spawn. The hump, which appears in moderate form on the back of breeding male chinook is much exaggerated in the pink and gives him his other name.

The greatest numbers are found in southeastern Alaska where the runs are usually from June to September. Most of the catch there is made by traps though any adaptable method except trolling would be productive. All are sold to consumers in the canned forms.

THE CHUM SALMON

The chum appears to have the widest range of all salmon species and is least valuable. Formerly it was used only for dog food, whence the other common name of dog salmon. Late season runs are typical, and its greatest numerical strength is from Puget Sound through southeastern Alaska. The young go to sea as soon as they are able to swim and may return in either their third, fourth, or fifth year. They may be taken by all except trolling gear. An uninviting appearance when caught is

not improved by canning for, though the ugly, blotchy shape is then no longer evident, their light yellow flesh turns still lighter. The average weight of eight pounds is comparatively large, but their food value is lowest of the five species. Only the World War succeeded in creating a large market for them, though they still find favor in the South of the United States and in other places where food must come cheap.

THE STEELHEAD TROUT

The steelhead has previously been mentioned as properly belonging to the Atlantic salmon which it resembles in habits. Greatest numbers are caught commercially in the Columbia River (with gill nets) though the species ranges from California to Alaska. The average weight is from eight to fifteen pounds. It finds a ready market either fresh or frozen but, because the flesh is light in color, little is canned.

The composition of the flesh and the relative food value of the various species is shown in the following table.

Source: Daniel H. De Lencz, *The Salmon Canning Industry*, *Food and Fishes Monographs No. 1*, Corvallis, Oregon, 1937, p. 31. The order of the chart has been slightly changed here and some of the material deleted. See Daniel H. De Lencz, *op. cit.*, *Marine Products of Oregon*, (New York, The Statistical Publishing Company, 1935), p. 267, for a similar chart with somewhat different figures.

TABLE II
COMPOSITION OF CANNED SALMON*

Species	Total solids per cent	Fat per cent	Protein per cent	Ash per cent	Food value per pound calories
Chinook	36.83	15.72	17.67	1.22	991
Sockeye	35.22	11.22	20.80	1.23	860
Silver	32.51	8.49	21.08	1.21	750
Pink	30.20	6.99	21.40	.76	696
Chum	29.96	6.69	20.67	1.02	514
Steelhead	33.16	8.95	21.32	1.21	792

*There is no appreciable difference between the composition of canned and fresh salmon.

Source: Daniel B. De Loach, The Salmon Canning Industry, (Oregon State Monographs No. 1, Corvallis, Oregon, 1939), p. 21. The order of the chart has been slightly changed here and some of the material deleted. See Donald K. Tressler, et. al., Marine Products of Commerce, (New York, The Chemical Catalogue Company, 1923), p. 387, for a similar chart with somewhat different figures.

CHAPTER III

APPLIANCES AND METHODS OF THE SALMON FISHERY

You see the way the Fisherman doth take
To catch the Fish; what Engins doth he make?
Behold how he ingageth all his wits,
Also his Snares, Lines, Angles, Hooks, and Nets.

John Bunyan, The Pilgrims Progress

Some of the methods employed in catching salmon are as old as the history of fishing and have been used in waters where no salmon ever swam. Others are most typical of the salmon fishery. Gill nets, traps, purse seines, and trolling lines are the chief methods used today and they became of great significance to the salmon industry in about the order listed. Fish wheels once took a sizeable portion of the catch, but they have been legislated from existence in the areas where they functioned most efficiently. Drag seines likewise have been effective, but only in the very limited areas where nature has permitted their use.

The efficiency of the gear itself has, in most cases, increased very little in the period of application to the salmon fishery. A casual perusal of the annual statistics of the salmon pack since the inception of the industry reveals a steady increase in volume suggesting, perhaps, vastly more efficient gear, or conservation measures eminently successful. Neither is entirely true. Gear of destructive efficiency has been checked by legislation and the volume of the pack sustained or increased by tapping more remote runs of fish and canning greater quantities of the

less desirable species. This widening range of operations and greater efficiency of mobile forms of gear was facilitated by the advent of internal combustion and Diesel motors in boats used to catch or transport the salmon. The fish trap, which of itself has, certainly, increased in efficiency, waited the greatest extension of its use until complemented by the motor-powered boat. It is notable that in the gill-net fishery of Bristol Bay, the scene of strict conservation measures, limitation has been prescribed less for the net than for the propulsion of the boat. The law requires the ancient dependence upon sail or oars in that region.¹

Aside from the scope afforded by technological improvements or the restrictions imposed by law, the type of gear used has been dictated by the physical nature of specific localities and by the habits of the fish themselves. The different forms of gear and the boats associated with them will be individually discussed.

TROLLERS

Trolling and trolling boats of commercial significance made the latest entrance in the salmon fishery. Little more than twenty-five years has elapsed since the earliest trollers pursued the chinook and silver salmon--the only two species ordinarily caught with hook and

1. Laws and Regulations for the Protection of the Fisheries of Alaska, U. S. Dept. of Commerce, Bureau of Fisheries, Department Circular No. 251, (1938), p. 11.

and line--on their ocean home. Such fishing has never been confined to the brief spawning runs and this, joined by the fact that those two species are larger than the others and are generally considered superior when caught at sea, has made this method the main-stay of the fresh, frozen, and cured salmon trade.

From comparatively early times on the coast Indians,² sportsmen and, occasionally, commercial fishermen have trolled for salmon with hand lines.³ Not until about 1912, however, when fishermen of the lower Columbia River discovered that salmon might be taken by trolling off the bar in the power boats introduced a few years earlier, did this form of gear become important to the salmon industry. Thereafter the method spread rapidly along the coast to Fort Bragg, California, on the south and through southeastern Alaska on the north. The rapidity of its growth may be apprehended when it is stated that by 1915 approximately 500 boats were trolling off the Columbia River alone and four years later the number exceeded 1000.⁴ Since 1919 the total in that area has decreased but those remaining have improved in efficiency.⁵ The

2. Explorations and Surveys to Ascertain the Most Practicable and Economical Route for a Railroad from the Mississippi River to the Pacific Ocean, 1853-1855. 36th Cong., 1st Sess., H. Ex. Doc. No. 56, (Washington, 1860), Vol. XII, p. 311, reports the traditional Indian method of trolling.

3. This method is still followed in southeastern Alaska by Indian and white commercial fishermen who have but a small outlay of capital.

4. Cobb, *op. cit.*, p. 487.

5. A Study of Commercial Fishing Operations on the Columbia River, (Oregon State Planning Board, Report to the Governor, 1938), p. 30.

boats today are larger; many of them are Diesel powered and contain a fish hold with a capacity of four tons, or even treble that weight in ice and fish. Better equipment and increased knowledge of the habits of salmon at sea enables such boats to make trips of several days' duration and return loaded deep.

The typical trolling boat has been of any length between thirty and sixty feet and the beam relatively great. Most of them have been fairly deep and of round-bottom construction.⁶ The "double-ender"--that is with the stern as well as the bow brought to a point, was, and is, the type favored by the majority of fishermen because of its asserted superiority in meeting the hazards of following seas and dangerous bars. A greater than common upward sweep of the sheer line to both stem and stern-post has also been typical of these craft. Like characteristics are distinctive of Scandinavian fishing boats reaching back to viking times and have also been exemplified in the Columbia River gill-net boat. Some trolling boats have, indeed, been only a larger edition of the gill-net boat as far as hull-lines are concerned.

Troll-fishermen may be either white or Indian but, though no statistics are available, Scandinavians (especially Norwegians) and Finns appear to predominate. Comparatively early concentration of people of such national origins in the salmon area is, however, attested by the census. Their noted leanings to sea faring and fishing would lead one

6. A new trolling boat ready for fishing may represent a capital outlay of from three thousand to ten thousand dollars.

to arrive at the same conclusion as regards their numbers in the troll-fishery. At any rate the fishing boats of the northwest, when contrasted with boats largely manned by men of Latin derivation from San Francisco south, present a similarity to traditional Scandinavian construction scarcely to be accounted for merely by the somewhat analogous physical conditions found along the northwestern coasts of Europe and America.

The larger trolling boats of today may carry a crew of three or more men, but the smaller "two man" boat has been most typical. "One man" boats are also still common. The trolling boat may be owned by two partners or more likely by the skipper who pays his helper, the boat puller--or "swivel-neck"--as he is sometimes called, with a share in the proceeds of the catch, usually amounting to twenty per cent of the gross. Three thousand dollars gross intake for a season is generally considered the barest minimum upon which a one-man boat can operate.⁷ The 1939 season on the Oregon coast began and ended with the large chinook or "splitters" (individuals above fourteen pounds weight when gutted) bringing twelve cents a pound at the fish dock. Smaller chinook and all silvers started

7. "Only about sixty per cent of them make it pay," said a buyer interviewed, "and those are the men in the smoker [Diesel] fleet who can really stay out there in their bigger boats and fish." Although there is no data regarding the correlation between the size of the boat and fishing efficiency, general observation leads to the belief that the larger boats, on the whole, do catch proportionately more fish--if for no other reason, simply because the hardships on bigger boats are less and the crews will fish longer and harder. A study by Rounsefell and Kelez (cited in the next section) found that, as far as purse seine boats were concerned, fishing efficiency increased in proportion to size. Trolling and purse seine methods, however, differ considerably.

at six cents but rose to seven cents near the season's end. Those prices are about average for that region. Salmon delivered on the Oregon coast by trollers have usually reached the Columbia River companies which have either dictated the price or, rarely, submitted to a pre-season price agreement with the union. Some trollers sell through co-operatives. Puget Sound prices have usually been a few cents higher, while in Alaska, troll-caught salmon have occasionally brought double the price paid on the Oregon coast.⁸ Fish caught on trolling gear have invariably brought higher prices than those taken by other methods. The fishermen have demanded a premium for the individual attention and care given their catch.

Today, as since the method was developed, the typical trolling trip on the ocean begins when the boat heads down the bay, river, or inlet an hour or two before dawn. With the bar or the land safely behind and the boat lifting to the long northwest swells, fishing may start as soon as the bottom is deep enough that the possibility of losing expensive gear on the low-lying rock ledges is minimized. Thereupon the motor is throttled down to trolling speed of from two and one-half to four miles an hour and preparations are made for streaming the gear.

First, the four poles must be lowered. The pair at the bow are

8. At Ketchikan, Alaska, toward the end of the 1938 season, the price on the dock was raised through the competitive bidding prevalent among fish buyers there, to twenty-five cents a pound for large chinook and seventeen and one-half cents for silvers and small chinook.

about twenty-five feet long and fastened to the foredeck with a pivoted-hinge arrangement. When not fishing, these poles are tilted upward and backward so as to be supported by the cross trees on the mast or upon hooks provided on the main poles.⁹ To place the bow poles in fishing position they must be wrestled forward and lowered outward to rest in the crotch provided for each upon either rail. In position they will sweep outboard from the side of the boat at about a thirty degree angle from the water and point a trifle forward of right angles to the boat's center line.

The main poles are ten or fifteen feet longer than the bow poles and are hinged to the deck, either well inboard beside the mast or out on the rail caps opposite.¹⁰ When not fishing they are upright beside the mast, held in their crotch at either end of the cross trees by means of halliards rove through blocks at the juncture of cross trees and mast and led below and belayed within easy reach. To lower the main poles these halliards are slacked off until the poles point from the sides of the boat at an angle only slightly higher than that allowed for those

9. The arrangement here described is that of a boat with a single mast. The larger boats, and especially those in Alaska, will quite likely be two-masted and have both pairs of poles supported in the manner here indicated for the main poles only.

10. Many fishermen assert that they can determine whether a particular boat belongs to a Norwegian or a Finn by the position in which the main poles are fastened. Norwegians are said to prefer the inboard arrangement and Finns the outboard style. Be that as it may, the fact of wide variation in rig is not to be denied. The differences are, however, less to be ascribed to national origins of owners than to the originality of individual trollersmen who are, of salmon fishermen, most independent.



Fig. 1. A typical trolling boat. The arrangement of poles shown here has been most common.



Fig. 2. Where salmon feed birds may feed.

at the bow. An additional brace or forward guy is secured to counteract the drag of the heavy lines on the extended pole.

The fishing lines, which will number two on each bow pole and two or three to each main pole in boats rigged to seek the salmon beyond the three mile limit of jurisdiction exercised by state, province or territory,¹¹ can now be let into the water.

The lines on boats operating southward of Puget Sound have been, in the majority of cases, 80 to 90 thread cotton. On boats operating from Puget Sound northward the lines, in greater majority, were changed about ten years ago to wire, laid up much like wire clothesline and of about the same guage. The greater initial expense thus entailed was justified, in the northern area especially, because wire gear better withstands the strain of dragging over the hidden reefs so prevalent there.

The separate lines are of various lengths; those on one pole are, however, matched by their counterparts on the opposite pole and the depths at which the lines are set to fish are likewise the same for corresponding lines on either side. All lines are attached to the poles with a steel coil-spring about eighteen inches long intervening. At the depth and distance which it is intended that a particular hook should fish a lead weight elliptical or spherical in shape (if home made it may be a length of gas pipe filled with lead) and weighing from three to

11. Aside from taxes on the boat the sole means yet devised of regulating "outside" trollermen is to force them to purchase a license for landing fish and pay a poundage fee on those delivered.

fourteen pounds is introduced into the line. Immediately above the lead is a spacer bar and swivel to which a piece of strong rubber about eighteen inches long is attached. At the free end of the rubber a linen leader (cuttyhunk of about two hundred pounds test) and approximately three fathoms in length is tied. Next comes a thirty to forty inch length of piano wire leader and finally the spoon and hook. Of the latter, numbers five to eight have been used, depending upon what the fish appeared to like best at a given time. Number six and one-half has probably been used most consistently. Quite likely, however, a fisherman will use different sizes at the same time on different lines in order to provide the salmon with a wide variety of lures. When one size, or one of the various brands, proves consistently popular with the fish on a given day, that type will replace the others.

At a distance below the first lead on the main line slightly greater than the total length of the cuttyhunk and wire leaders, a second lead,¹² heavier than the first, is introduced and above it is fastened another system of rubber, cuttyhunk leader, wire leader, etc., terminating in the second hook. If the line being rigged is one of the tip lines on either of the main poles, the process described will be repeated twice more for those lines are ordinarily longest. The next line inward on the main pole is usually fastened from an intermediate tip held to the

12. Since about 1930, with the introduction of powerful motorized reels, more and more fishermen have used a single but much heavier lead at the bottom of the line. The system described above is still most prevalent.

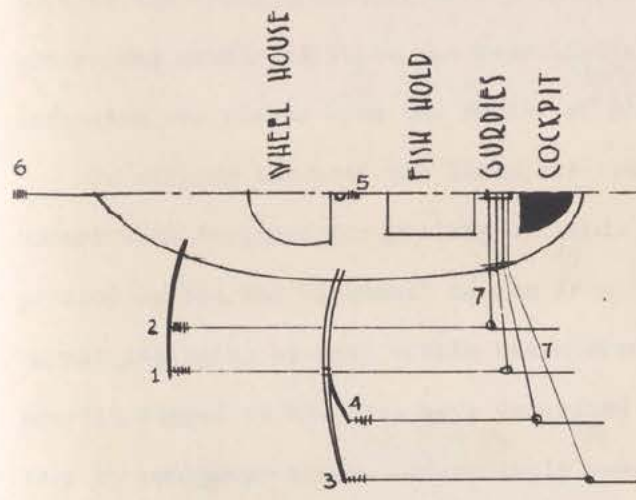
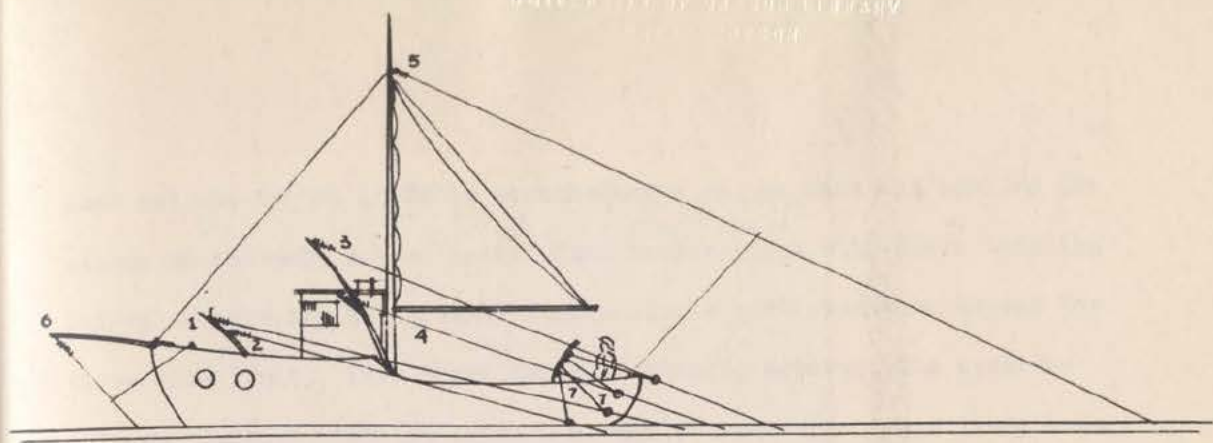
main pole by lashings. This arrangement is designed to afford the second line a springiness equal to that of the tip line. When rigged, this second line will be slightly shorter and, with heavier leads, made to fish a bit deeper than its neighbor. Three hooks will probably be streamed from it. In the remaining space on the pole between the second line and the boat a third and yet shorter line is sometimes added which is designed for two or, possibly, three hooks and which will be made to fish still deeper than the two already rigged.

From the tip of the bow pole a line of such length and depth as not to foul the others and flying two or three hooks will be secured. The second and innermost bow line is trailed close to the boat. This is the shortest of all and may be either lightly weighted so as to fish almost on the surface beside the boat, or it may be heavily weighted to fish deep beneath. In either case a single hook will most likely be used.

As said before, this whole arrangement will be duplicated on the opposite poles--that is, unless as sometimes happens, two partners will be at variance in their ideas regarding the effectiveness of certain details of rig and they agree to each take a side and fish it as they please.

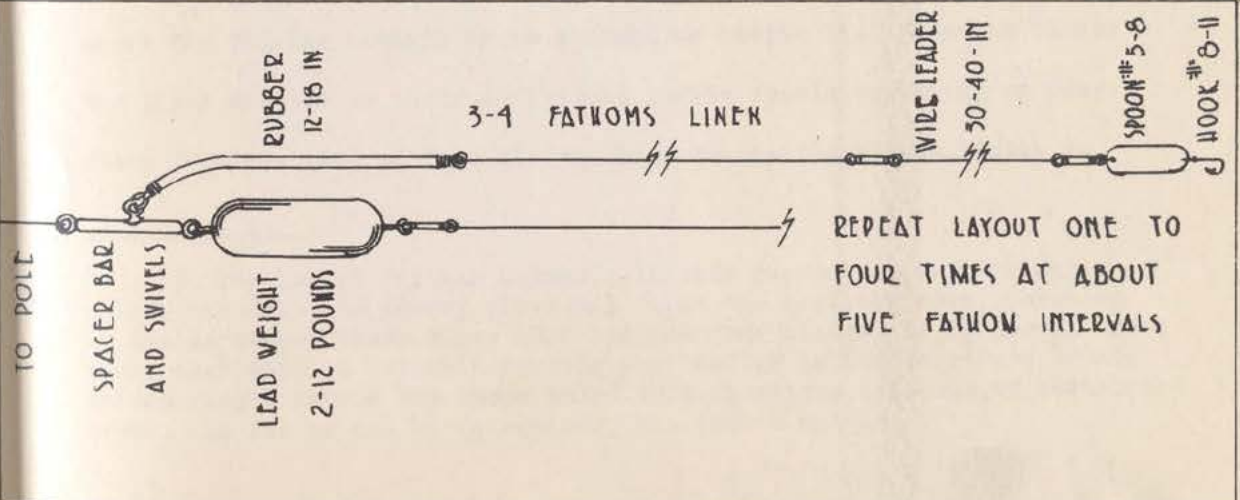
Sometimes an additional pole called the "snooter" is extended directly forward over the bow and from it a line is made to fish in such fashion that its single spoon flashes just below and forward of the propeller which appears to bear a singular attraction for the salmon. Likewise still another line, longer than all others, and with a very light

Diagram of a Trolling Boat Rig



- 1 BOW LINE
- 2 JIGGER LINE
- 3 TIP LINE
- 4 SPRING LINE
- 5 SHORTER LINE
- 6 SMOOTHER LINE
- 7 INHAULS

TROLLING BOAT RIG



DETAIL OF TROLLING LINE

lead and one or two hooks is attached high on the mast and trailed far astern in the wake of the boat. Thus twelve lines with hooks totaling thirty or more may be streamed from a single boat operating beyond the three mile limit. From Puget Sound northward, however, the numerous islands combined with the extreme irregularity of the coast line, brings much of the trolling waters within the local law. In Alaskan inside waters the number of lines has been limited to four, although no restriction was placed upon the number of hooks.¹³

In rigging the boat the lines are not fastened directly to the pole except when designed for pulling by hand. When such is the case a length of line called the "in-haul" is run from the boat to each fishing line to permit its being brought within reach when a fish strikes. No lines so heavily rigged as the ones here described could be pulled many times an hour by man-power alone. Accordingly power reels or "gurdies" are resorted to in the better-rigged boats. In such cases the lines pass through thimbles at the end of a pendant equidistant from the pole to the water and are led through blocks affixed to a yoke on the boom above the fishing cockpit or to stanchions beside it. From the blocks the lines are led to their individual gurdie spools operating on power drawn from the motor. Thus all the line to the first lead, which is

13. The law of British Columbia in this respect is unknown but unless the writer's memory plays him false the trollers seen operating on inside waters there since 1936 had but four lines. It is known, however, that British Columbia forbids the landing in its territory of any salmon caught beyond the three mile limit in waters adjacent to restricted areas. As far as can be determined this law is unique.



Fig. 3. Gurdies or power reels for hauling heavy trolling lines.



Fig. 4. A trollerman with a large chinook or "splitter".

stopped at the thimble, can be quickly reeled in but the remainder must yet be pulled by hand. When not fishing all the lines from the first lead to the end are coiled away in shallow boxes, and the spoons are placed in a chemical solution to preserve their metallic brightness.

To start the lines fishing the hooks are baited¹⁴ with one of the herring bought in a frozen block and so attached as to tow realistically head foremost in the water. In lieu of herring a silvery strip of salmon belly is very effective. When all the lines have been paid into the water from the cockpit the fisherman sits on its coaming with the tiller between his knees. His eyes constantly rove from one spring to another,¹⁵ alert to the tell-tale jiggle warning him when a fish is hooked. He jumps to the gurdy, throws in the clutch of the proper spool and the line comes humming in to the first lead. The gurdy is then stopped, and the balance of the line brought in hand-over-hand allowing the salmon no slack. The fish may be either gaffed or swung aboard.¹⁶ There it is clubbed on the head, removed from the hook, and placed in a compartment upon the deck. When several have been caught and there is a respite in the fishing, the salmon are cleaned (with the head left on) and passed below into the fish hold to be packed away in

14. From Puget Sound northward this is usually the case; southward of that area the dependence is generally upon the spoon alone.

15. Hence the term "swivel neck" sometimes applied to him. Some fishermen, especially Indians, attach small bells to the springs in order to be warned that a fish has struck.

16. Fish well hooked need not ordinarily be gaffed unless unusually large. As the spawning season approaches, however, their mouths soften, the hooks tear out more easily, and a gaff is more often resorted to.

the crushed ice taken aboard the evening before the trip began. The trollerman handles his catch with care, for he may be docked for fish with scales knocked off or otherwise blemished.

When fishing is good two men may be kept more than busy trawling in the salmon, cleaning them, and icing them down. If a school is encountered, the boat will move back and forth endeavoring to stay upon it.¹⁷ With good fortune a school may be followed for days at a time until the boat is loaded or the ice runs low.

Meanwhile the trollerman lives close to the sea--closer than any deep-water sailor. In matters of navigation his acquaintance with the higher art may be of no great depth, but he possesses an uncanny sense of direction that the skipper of a liner might envy.¹⁸ He knows the set and run of tides and currents and has supreme confidence in his judgment of the weather. As he follows the salmon he is accompanied by myriads of other sea-creatures which also seek the salmon or share in the feed the salmon pursue. A variety of birds cry and squabble eternally in the emptiness. During July and August ponderous whales and the smaller blackfish may be his convey. Sharks will steal the salmon from his hooks and foul his lines in a tangle requiring precious

17. Because a school of salmon move together in a general direction, they usually bite better when the boat is on one slant than another.

18. Many trolling boats now, especially since great numbers of them fish farther at sea for tuna when in season, are equipped with radio-telephone and radio-compass.



Fig. 5. Salmon trollers turned tuna fishermen, off the Oregon coast, 1938.

Fig. 6. Trolling boats unloading silver salmon, Newport, Oregon, 1937. The box being hoisted contains approximately six hundred pounds of fish, worth about forty dollars to the fisherman.



hours to unravel. Sea lions and seals may also follow, snatch choice fish from the hooks, toss them into the air and bite out their bellies in a welter of blood, and of birds screaming for the remainders. Rarely --very rarely, a lucky trollerman may see a little animal, somewhat like a humorous brown spaniel in the water; and that will be such a sea otter as lured the first men who sailed in numbers along the northwest coast seeking a livelihood.

The troller will anchor at night if possible, but otherwise will heave-to beneath the tiny steadying sail and drift with the sea. When sea-weariness, lack of ice, bad weather, or possibly a full load drives him to port he will get his only real rest and well rounded meals.

Since the market of the trollermen has been in the fresh, frozen, or mild-cured trade, they are wholly independent of the salmon canning industry which has long since tended to exercise a degree of industrial control over other forms of gear and over the men operating them. Trollers are the true entrepreneurs amongst salmon fishermen.

THE PURSE SEINE

Unlike trolling gear but as with all other methods which have been used in the salmon fishery, purse seines have caught all the five species. Long before the advent of power boats this was an important form of gear, but as with trolling it was the motor which enabled the old records to be far surpassed, and the purse seine to become of major significance to the salmon industry.

The purse seine has been, essentially, a long net with cork floats on its upper edge and lead weights on the lower. Thus it hangs vertically from the surface of the water. Along the lower edge, at short intervals, five-inch galvanized iron rings are fastened. A one and one-half inch rope--the purse line--is threaded through these. When a school of fish is observed the net is circled around it and the purse line is drawn tight, closing the bottom much in the fashion of a bag with a draw string. The greater portion of the net is then hauled aboard crowding the fish into the remainder where they can more easily be dipped out. Though purse seines were used for years in the mackerel fishery of New England the Puget Sound type, first used on the Pacific coast, is said to have been introduced by Chinese.¹⁹

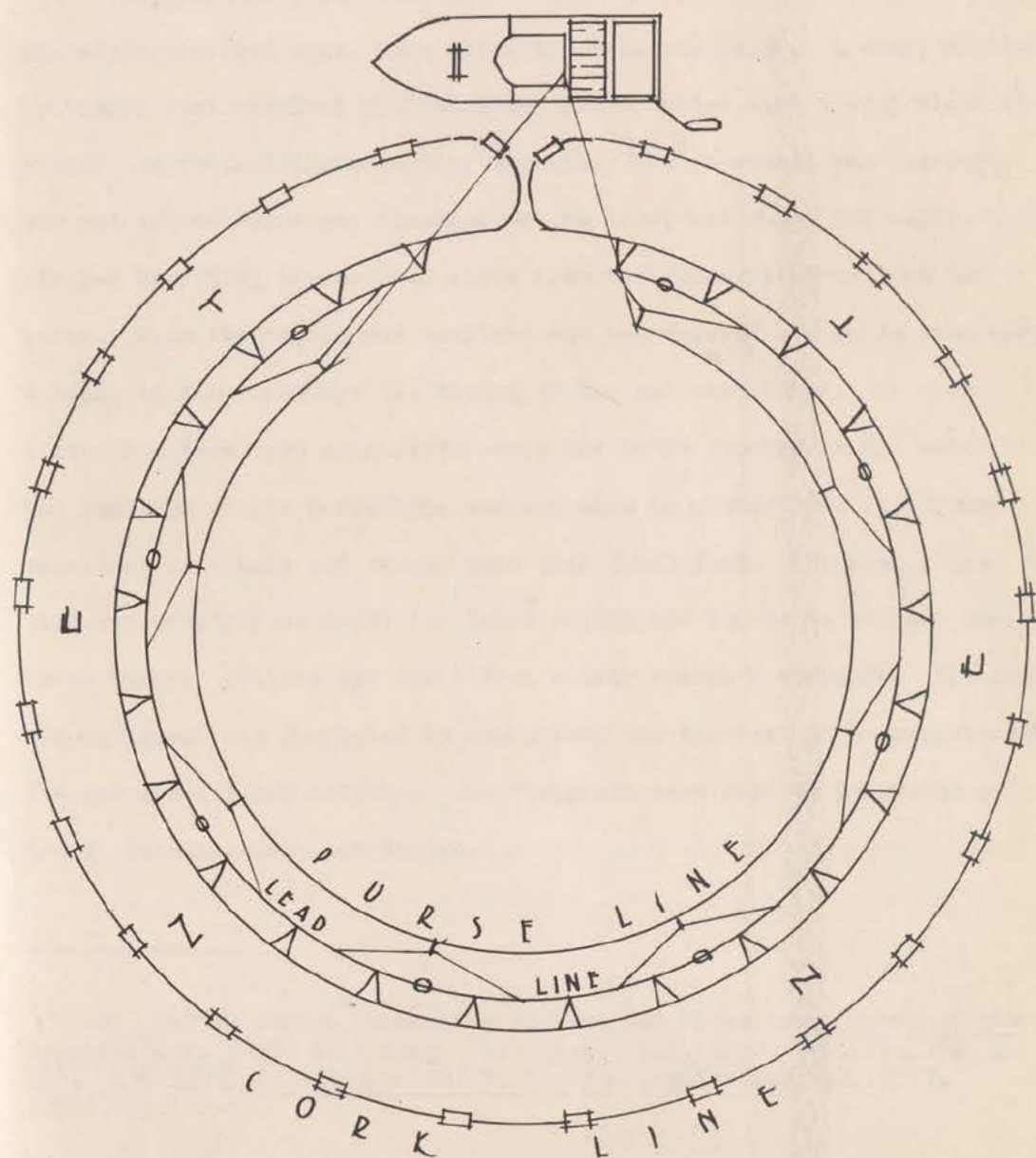
The earliest date at which this form of gear was found mentioned in connection with the salmon industry is 1882.²⁰ At that time its importance was asserted, and it was declared to be largely in the hands of Indians who used nets fifty to eighty fathoms in length and from four to eight fathoms in depth. The fishing was conducted from canoes and all species except sockeyes were reported in the catches which might include five thousand salmon in a single haul.

Ten years later purse seines were again reported from Puget Sound

19. Bulletin of the United States Fish Commission, Vol. VIII, 1888, 51st Cong., 1st Sess., H.R. Misc. Doc. No. 211, p. 55.

20. George A. Rounsefell and George B. Kelez, The Salmon and Salmon Fisheries of Swiftsure Bank, Puget Sound and the Frozen River, U. S. Dept. of Commerce, Bureau of Fisheries, Bulletin No. 27, p. 726.

PLAN OF THE PURSE SEINE
SPREAD IN WATER



as having been introduced there in 1886.²¹ They were declared to be "the most effective form of apparatus yet used in the salmon fishery." The technique had been improved and larger nets were recorded. Lengths of two hundred fathoms and depths of twenty-five fathoms had, apparently, become typical. A great six-oared skiff decked forward eight feet from the stern provided space upon which to flake the seine. A scow, eighteen by twenty feet received the catch and was provided with a hand winch at either end to facilitate pursing the net. When a school was observed one end of the seine was attached to the scow, and while the skiff circled the fish, the net was drawn from the stern platform into the water. When the circle was complete the two ends of the purse line were brought to the winch and the bottom of the net was closed. As when canoes had been used some disturbance had to be created in the water at the juncture of the purse line and net ends to prevent the fish from escaping. A single set caught more than 6,500 fish. The best price paid was twenty-five cents for large salmon and ten cents for the small. Three hundred dollars was considered a fair season's earnings. All gear and equipment was furnished by canneries, and the cost of a complete outfit was about 1,200 dollars. The fishermen were said to be Italian, Greek, Scandinavian, and Indian.

21. United States Commission of Fish and Fisheries, Report of the Commissioner, 1888, 51st Cong., 1st Sess., H.R. Misc. Doc. No. 274, p. 254. See also, Bulletin of the U. S. Fish Commission, Vol. VIII, (1888), pp. 55-56.

A subsequent report described the purse-seine fishery of about 1895.²² The gear and the methods had changed little except in the size of the nets which had attained a length of 250 fathoms. The mesh is given as from two and one-half to three inches. In 1897 and 1898 the number of units operated on Puget Sound was forty-six and forty respectively. About half of them operated in the immediate vicinity of Seattle and an average of twelve thousand salmon daily was reported for each seine at the season's peak.

In those days the purse-seine crews necessarily camped ashore near the best fishing grounds, and each morning and evening the heavy skiff and clumsy scow were laboriously worked back and forth. Rathbun, however, cast himself in the role of a seer when he wrote:

It [the purse seine] is the only kind of apparatus, aside from hooks and lines, that can be utilized in the open waters at a distance from the shores, and as the salmon of a certain species may school anywhere it is destined to remain one of the most important fishing methods, especially for supplying the large catches demanded by the canneries.²³

Whether or not Rathbun had been impressed by the possibilities foreshadowed in the arrival of the first gasoline-powered fishing boat on Puget Sound in 1898²⁴ he had placed his bets for the right reasons. In 1903 there was still but one purse seine boat with motor power in the region²⁵ but by 1907 the Pacific fisherman was able to declare in the

22. Richard Rathbun, "A Review of the Fisheries in the Contiguous Waters of the State of Washington and British Columbia, U. S. Commission of Fish and Fisheries, Report of the Commissioner, 1899, 56th Cong., 1st Sess., H.R. Doc. No. 662, pp. 311-12.

23. Ibid., p. 311.

24. Rounsefell and Kelez, op. cit., p. 728.

25. Cobb, op. cit., p. 480.

caption beneath a picture that gasoline power was now universal in the purse-seine fleet.

The efficiency of the gear was, of course, greatly enhanced by the new mobility which permitted a rapid shift of operations over a wide range of fishing grounds. Thus in a single season an individual purse-seine boat might fish from Puget Sound through southeastern Alaska.

Shortly following its introduction the purse seine became the most important type of gear in Puget Sound; but by 1895 successful fish traps had assumed the ascendancy. Since these last have been abolished in the state of Washington by "Initiative 77" purse seiners, whose catch was never anything but large, have again enjoyed a resurgence in the proportion of the total catch in that region.

The introduction of motor power naturally brought a change in the type of boat used.²⁶ The new mobility made an open boat inadequate for, among other things, it became necessary for the crew to live aboard. Seaworthiness became a prime consideration as the range was extended ever farther down the straits and finally into the ocean beyond. An indication of the growth both in numbers and size of seine boats and in the fishery itself is in the fact that 1912 alone saw laid down nearly fifty purse-seine vessels that ranged from fifteen to

26. Issues of the Pacific Fisherman for the decade following 1906 are replete with revelations as to the effect of the internal combustion motor upon boat construction and upon the salmon industry.

to twenty-five net tons.²⁷ The size has continued to increase since that time.²⁸

The vessel which evolved and is today common may be from sixty to eighty feet in over all length and comparatively beamy, with a high bow and a low stern, broad and rounded. The raised fore deck provides a foc'sle beneath for the crew. Well forward, and often partly over the foc'sle the galley and pilot house rise from the deck. An auxiliary wheel atop the pilot house provides the helmsman an unobstructed view while fishing and has been in evidence since about 1919. The single tall mast often bears a crow's nest providing a wider range of vision in searching for schools and also supports an unusually long boom always topped. Beneath the pilot house and galley is the engine room which, in the majority of boats built since 1925, has a Diesel motor installed. One of these oil engines appeared in a purse-seine boat in 1914, but the high initial cost prevented their general use for a decade.²⁹ The arrangement of the purse-seine vessel here described leaves the entire after half clear for a fish hold below and working space on deck. At the low, broad stern a turntable for stowing the net has replaced the platform of the four-oared skiff but the roller at its after edge is still retained and it, like the

27. Rounsefell and Kelez, op. cit., p. 730.

28. Purse-seine vessels intended to take part in the Alaska fishery are limited by law to a length of fifty feet between perpendiculars (keel length).

29. Rounsefell and Kelez, op. cit., p. 730.



Fig. 7. An Alaska purse-seine boat, 1939. The crew is on the usual pre-season strike over prices.

Fig. 8. A good catch. Note: The boat shown here is an Alaska purse seiner engaged at the time in the herring fishery. A slightly different net might change the deckload of herring to salmon.



pursing winch, has for many years been speeded by the motor which propels the boat.

A study made by Rounsefell and Kelez reveals that for pinks, silvers and chums the relative-efficiency ration of purse-seine boats increased as they were built larger, up to forty tons and over. The dense schooling of sockeyes in certain localities for brief periods results in "disproportional catches" and creates an exception. This study also makes manifest that the average efficiency of purse-seiners had nearly doubled between 1909 and 1934.

The crews of purse-seine boats usually number from five to seven men who may be either white or Indian. The latter are quite common in Alaska where many of them fish either their own or company-owned vessels. Among white crews, both in Puget Sound and Alaska, Norwegians and "Austrians" (largely from Dalmatia in the present Jugo-Slavia), and who must be citizens of the United States, appear in predominance.³⁰ Since about 1925 many purse-seine vessels have fished in southeastern Alaska during the summer and have then returned to Puget Sound for the late runs there. No salmon caught with this type of gear can be legally landed in Oregon or California.

The five men composing the crew of the average purse-seiner have

30. Crews of British Columbian purse-seiners present much the same racial pattern except that the "Austrians" are, in part, replaced by Japanese or "Togos" as they are locally known.



Fig. 9. Purse seiner
discharging herring
at an Alaskan plant.



Fig. 10. Alaska purse seiners dur-
ing the weekly closed period.

consisted of skipper, cook, engineer and deck hands.³¹ Even the cook has had to help pull net. All have received equal shares, but when the skipper has also been the owner he has received a portion of the shares assigned to the boat and net. The catch has been sold in the round, by the fish.

Under present conditions when the season opens, the boat will be on a favorite fishing ground awaiting the incoming tide and the salmon it may bring with it. If jumping salmon are observed on the flood, the skipper will select the point for a set. If within the inside waters most typical of this fishery in Alaska, he may head the boat full speed for shore where the granite cliffs drop almost sheer into the sea. At the latest possible moment he will throw the propeller into reverse and one or two men will leap into the towed skiff, cast it loose, row madly the short remaining distance to land where the shore line will be made fast to a convenient tree or rock. "All fast," they shout, and again the engine roars at full speed straight out from the point while the twelve hundred feet of corkline and lead-line with a seventy-foot deep net of two and three-fourths inch mesh between, runs off the turntable and forms a barrier for the fish.

As the last of the net goes overboard the speed of the boat is slackened, but not too much, for the pressure of the tide against the

31. Many purse-seine boats are owned in shores by their crews--sometimes by two crews, one of which will use the boat for the Alaska and Puget Sound salmon fishery in the summer and the other will take it to California for the sardine fishery in the winter.

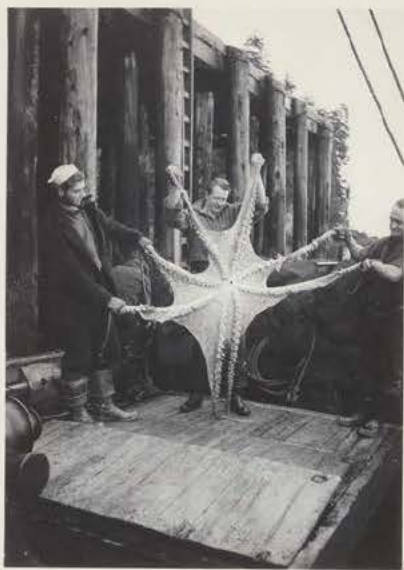


Fig. 11. Strange "fish"
may be brailed from a
purse seine.



Fig. 12. And sometimes
it blows a little.

net is tremendous. Now the net is circled back toward the point again. At a shout from the skipper the men with the skiff return the shore line aboard and the circle is completed. Turns of the purse line are thrown around the winch which groans at the strain until, barring bad luck, the bottom of the net is closed. The greater part is then hauled aboard until the salmon are a writhing mass of silver in the bunt. Into this mass a dip net or brailer made of netting attached to an iron hoop about four feet in diameter and with a handle about ten feet long is dropped. A tackle secured near the juncture of handle and hoop hoists the brailer full of fish and swings it inboard with the help of the men balancing the long handle. Above the fish hold the brailer is tripped, dumping out the salmon. When the net is stowed and the boat washed down, a likely place is sought for another set, and the process is repeated day after day throughout the brief season over hundred of miles of inlet and open sea.

A half dozen lucky sets may fill the boat to capacity (about 8,000 fish in the average vessel), and the catch will have to be sold. It may be run directly to the cannery or, perhaps, to a point of rendezvous with a cannery tender. Quite likely, too, a buyer's boat of large capacity will haul close, offering to buy the catch where it is at a discount of cents and fractions of cents per fish below the price the salmon would bring at the cannery. The hundreds of thousands which he transports will run that narrow margin into many dollars for him while the purse-seiner loses no time in seeking more salmon.

FISH TRAPS

The twenty-year period from 1890 to 1910 witnessed the greatest expansion of the salmon industry. Though purse seines were an important factor in this growth, the fish trap--sometimes called pound nets--afforded the primary impetus from their capacity of enlarging and stabilizing the supply of salmon to a degree most commensurate with large scale cannery operation.

Not only is the fish trap the most efficient type of gear for catching salmon, but it is also very expensive. The first factor has brought it, more than others, into public notice and legislation in the interest of conservation has resulted. The second factor, of high initial cost and expensive yearly maintenance, has combined with the comparative permanence of fish trap installation in conspiring that the larger cannery operators should acquire a considerable degree of concentrated control over fish supply. Noteworthy is the fact that "for many years the investment of capital paralleled the rate of trap installations."³²

This form of fixed gear appears most extensively in southeastern Alaska. It has been forbidden in Washington waters since 1934 but is allowed in restricted areas of Oregon and British Columbia.

Like all forms of fixed appliances in the industry, traps are built on the principle that salmon tend to follow a particular course

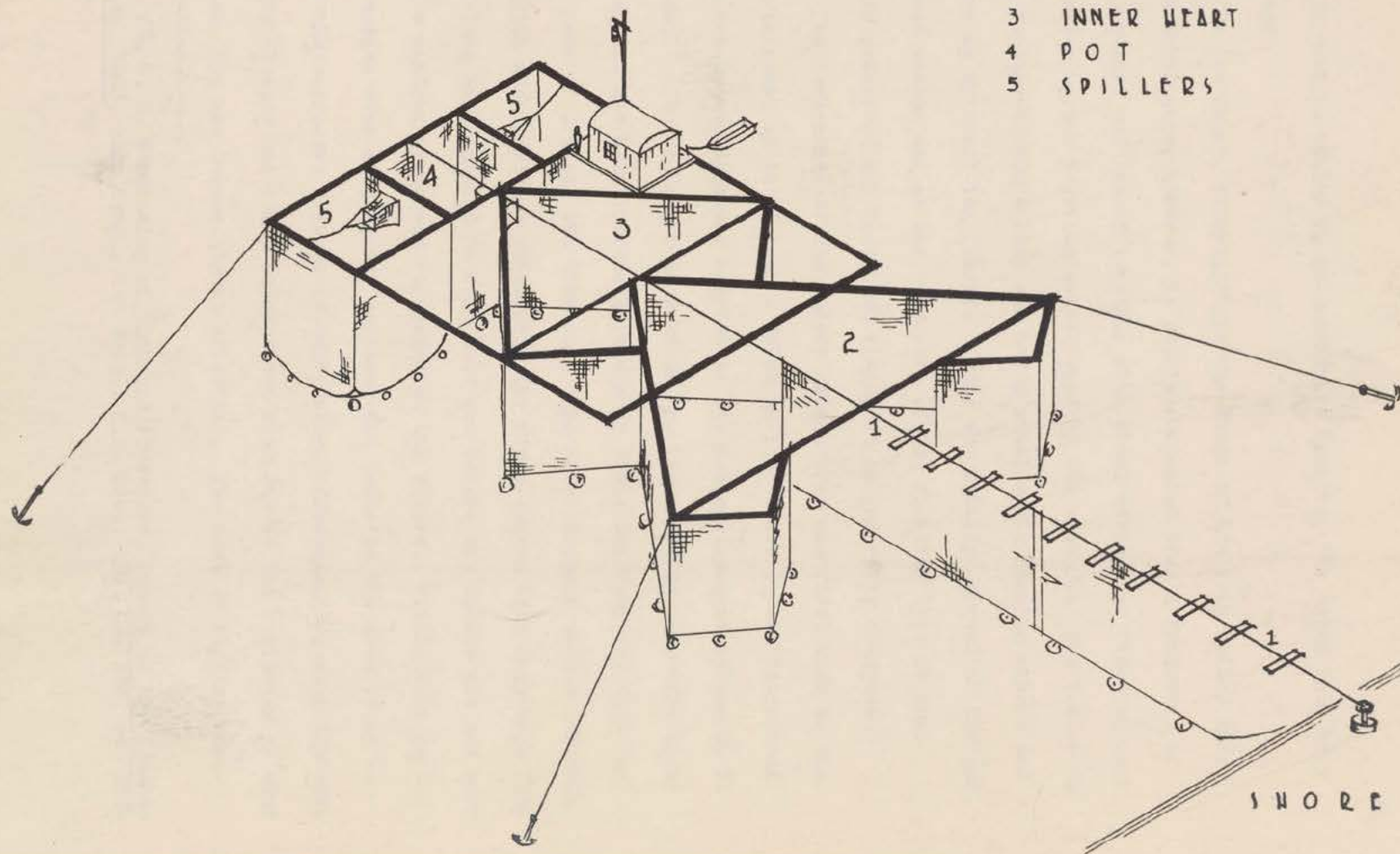
32. Gregory and Barnes, op. cit., p. 22.

in the water whether the shore line is as nature made it or as man has changed it. Accordingly, and because salmon rarely turn in their own wake, the trap can be so arranged that when the fish finds its progress barred it will be led to right or left along a wall of net into the trap.

Either the pile (or driven) trap and the floating type may be installed. Neither is in principle different from the other. In the former, piles are driven into the bottom and secured along the top by other timbers. From the framework thus provided the permanent netting is suspended. A long row of net-hung piling known as the leader runs at right angles from the shore into the outer "heart" of the trap. This heart is a v-shaped wall of piling and net with the wide end toward shore. Naturally the rear end or point of the "v" is not entirely closed, for by means of this narrow opening the salmon must enter.³³ Behind the outer heart or first "v" they find a second leading into the rectangular "pot". Thence they are led with the tides through a tunnel of webbing into the "spiller", another rectangular enclosure to right or left of the pot. Whereas the netting in the rest of the trap is nowadays of wire, that of the spiller is of twine

33. Traps will, of course, catch most any form of marine life. Halibut, flounders, sole, lingcod, tom-cod, dogfish, red snappers, wolffish, etc. Sometimes these are returned to the sea, but in many cases they are brailed with the salmon (it is difficult to separate them) and taken to the cannery which has no facilities for such fish and consequently they are thrown away--the valuable with the valueless. Sharks, seals and sea lions also enter the traps, and if possible they are shot to prevent them from destroying the fish or causing damage to the netting.

- 1 LEADER
- 2 OUTER HEART
- 3 INNER HEART
- 4 POT
- 5 SPILLERS



FLOATING SALMON TRAP

for it must be hauled up to facilitate brailing the catch into boat or scow.

In the newer, floating type the shape of the trap is the same. The webbing here, however, is simply suspended from a framework of logs, bolted and lashed together with steel cables and floating upon the water in the position established by its anchors. The leader is here suspended from a long and heavy steel cable running ashore and buoyed up by short log floats. Traps are usually removed at the end of each season and as the framework of the floating type is most easily preserved and installed again, it is generally cheapest.

The forerunner of the modern salmon trap was first used on the Pacific coast in the Columbia River in 1879 where it was introduced from the Great Lakes and adapted to its new environment by one O. P. Graham.³⁴ It had long been used on the Lakes and St. Lawrence River system and had been introduced there by fishermen familiar with the fyke nets of Ireland and Scotland. The first example on the Columbia met with such striking success in its first season that many more Lake fishermen were induced to come west and before the decade was out more than a hundred traps were operated on the rivers. Within this period galvanized wire netting had replaced the twine in the area lying beyond the corrosive effects of salt water. Subsequently, when the wire became cheaper and could be replaced with new at the beginning of each season, its use became almost universal. The cost of rigging each

34. U. S. Commission of Fish and Fisheries, Report of the Commissioner, 1888, 51st Cong., 1st Sess., H.R. Misc. Doc. No. 274, pp. 209-211.

trap in those days was given as about seven hundred to a thousand dollars. The present cost may be five times as much.

Another type, the so-called wooden trap, had been common on the Columbia River since the inception of the canning industry and was, essentially, a modification of the brush weirs used by Indians.³⁵ Whites had adopted the pattern but built them upon the shore of poles and planks. When completed they were launched into the river and sunk near the bank with stones. The ascending salmon were deflected into the trap by a leader carried downstream at an angle into the current. This type was not so efficient as the other, for when the river was low they often became ineffective, while their method of installation rendered them always at the mercy of the river's vagaries.

Puget Sound waters were first fished by traps about 1880 and in the ensuing ten years many experimental traps were constructed, but none proved suitable for the capture of the sockeye, the species most desired.³⁶ In 1885, however, an experienced trap fisherman from the Great Lakes began experiments which were to bring the trap to perfection a couple of seasons later. Thereafter the most productive sites only remained to be located. Point Roberts, near the international boundary and the traditional fishing ground of the Indians and earlier white fishermen, proved no less adapted to the new form of gear. By the year 1893 the traps had made possible the erection of a second cannery

35. Ibid., p. 211.

36. Rathbun, op. cit., pp. 295-305.

there and thirteen units of trap-gear were in operation. Indicative of the new trend was the fact that all but two of these traps were owned by the canneries. For the next forty years this form of gear was to take the greatest share of the Puget Sound salmon catch, while their relatively high cost tended to keep them in the hands of the canneries.

Finally, in 1934, they were abolished in Washington by initiative, partly on the charge that their fishing efficiency was destructive of the runs, and also in response to the claim that they permitted a monopoly control of the raw material of the salmon industry in that area.

British Columbia and the Canadian government resisted the pressure for establishment of salmon traps until 1894 when two were permitted in locations where the fish caught could scarcely escape the American installations a very short distance away.³⁷ After 1900 the restrictions were somewhat relaxed but subsequent to the World War the number was again limited as a project for spreading work amongst the fishermen. The results claimed have been summarized by Gregory and Barnes.³⁸

It is claimed by many operators that the reduction of traps in British Columbia waters has resulted in a higher cost of canning in that district. The mobile gear units are unable to store any quantity of freshly caught fish. The coming of the runs in very short periods of time compels the construction of larger plants than would otherwise be

37. Ibid., p. 302.

38. Op. cit., p. 23. See also, Fish Traps in Alaskan Waters, Hearings before the Committee on Merchant Marine and Fisheries on H.R. 4254 and H.R. 8213, 74th Cong., 2nd Sess., pp. 81-84.

needed to accommodate the peak requirements, it is said. The investment is thus greater per unit of output than would be the case if storage furnished by traps were available. Most of the traps have extra "spillers" devised for the purpose of holding large runs, in fresh form, until the canneries can finish the mobile gear catch and use the extra supply from the traps.

Until after the turn of the century successful fish traps were all of the pile or driven type. Accordingly they were restricted, especially in Alaska, to those relatively limited areas where the water was not too deep nor the bottom too rocky. To meet this situation a successful floating trap was developed in 1907 and patented the following year by a Mr. J. R. Heckman.³⁹ In preparation for the 1907 season at Loring, near Ketchikan, Alaska, he bolted and lashed together a framework like that previously described. Extending down into the water from these, two and one-half inch steam pipes were run to a distance of thirty-six feet. Eyebolts were fastened at intervals to the pipes to provide points for securing the wire netting.⁴⁰

Two weeks of the season had passed before the new trap was ready to fish, but it caught a total of 300,000 salmon, 20,000 of them the first day.

Subsequently the pipes were discarded when an equally effective and simpler method was developed which permitted the trap to be rigged at its winter station and towed to its fishing site with a minimum of

39. "The Heckman Floating Salmon Trap", Pacific Fisherman, Vol. VIII, (1908), p. 27.

40. So great is the demand that a galvanized wire factory is supported at Ketchikan, Alaska.

hazard.

To prepare modern floating traps for the fishing season a crew of ten or twelve men with a cook, and an engineer for the donkey engine, are quartered on a rigging scow and towed by cannery tender to the cove where the traps had been placed upon the beach the previous fall. There the forty-foot wire sides are laid out, fitted to the frame and stapled on. The bottom, likewise of wire, is fitted and hog-ringed to the sides. In place of the pipes used by Mr. Heckman, large stones are wrapped in wire and lashed along the lower edge of the side walls to keep them vertical when the trap is in position. When the wire rigging is complete, ropes are threaded through and the whole is gathered up within the framework to prevent damage during the tow to the fishing site. Arriving there the ropes will be cut and the stone-weighted webbing will plunge into the depth for which the bottom has been rigged, and as soon as the lead is hung and the heavily treated twine spiller is installed, the trap is ready to fish. The spiller, alone, is made of twine because, as mentioned before, it receives the catch and must be hauled up in order to "dry" the fish and permit them to be brailled out.

From six P.M. on Saturdays until six A.M. on Mondays traps are prohibited by law from fishing. The salmon which enter in that period are kept from the pot by closing the tunnel leading into it and are allowed to escape the inner heart by letting down folding sections of the wire walls known as "Sunday aprons".

The positions monopolized by traps would otherwise be most desirable points for purse-seine sets and operators of the latter form of gear have been, accordingly, often resentful. Occasionally they have taken vengeance by setting the two trap watchmen ashore, destroying their equipment, and cutting loose the wire netting. Before doing this last they have usually helped themselves to the fish. Foggy nights have been most favored for these reprisals and, also, by the out and out "fish pirates" among purse seiners and buyers who may disguise their boat, haul alongside, intimidate the watchmen and lift the trap. Indeed, the watchmen may connive with them, and for a consideration of twenty-five dollars or so will assist in lifting the spiller and in brailing the fish. For this reason, and as a matter of general safety for men and investments in such isolated areas, the canneries have had their own patrol boats constantly on watch during darkness.

Some of the canneries have themselves been unscrupulous, especially in a year when the runs proved meagre. Then they have encouraged the watchmen to fish during the weekly closed period, offering in their turn about twenty-five dollars for robbery. The danger of being caught has been small, for, if a sharp lookout was kept, the Bureau of Fisheries boats and planes could be despatched in sufficient time to get the trap opened. Indeed, since some traps are now equipped with radio-telephones and the watchmen are able to report and receive instructions regularly from the superintendent of the cannery, he can usually keep

them posted as to the movements of the few law enforcement officials, by means of a variation in the elaborate code used for company news and to keep the location of the most productive runs from non-company purse seiners.

Because Alaskan traps are located in navigable waters, permits for their location must be obtained from the War Department. Such permits are awarded for five-year periods. Each trap site must also be approved by the Bureau of Fisheries which enforces a minimum distance between locations. Additional sites are not now permitted and should one of those held be unoccupied for a season it is supposed to be closed to occupancy thereafter. Accordingly the best sites are at a premium. The method of holding them has been told by an operator.

. . . there is no way we can obtain any right or ownership to it between one year and another except to just get out there and sort of put a fishing device on it. Under the law they cannot put another fishing device within a certain distance. That is the only right we have against any body else.⁴¹

Traps account for about half of the Alaska salmon catch. The territory applies a tax of two hundred dollars on each unit of gear and exacts a poundage fee on the fish caught. These measures are designed for revenue rather than for conservation. The Bureau of Fisheries maintains that so long as traps are limited in number their abolition for the sake of conservation is unnecessary. Many indepen-

⁴¹. Hearings before the Committee on Merchant Marine and Fisheries, op. cit., p. 149.

dent fishermen, however, maintain that the best that can be said of traps is that they "hog the fish". The problem has evoked proposals leading on the one hand to total abolition as in Washington, or, as an editor suggested, to public owned fish traps for public benefit.⁴²

GILL NETS

More salmon have been taken in gill nets than with any other form of gear. The method is the oldest one used extensively in the Pacific coast salmon fisheries and for at least two decades following the inception of the canning industry it was subjected to no serious competition. Moreover, the effectiveness of the gill net has not been greatly improved since its earliest employment. Because, as its name implies, it catches the salmon by entangling their gill covers in its meshes, the dimensions of those meshes determines the size of the fish to be caught and of those allowed to pass through. Accordingly, regulation in the interest of conservation has generally limited the dimensions of the meshes, and of the nets themselves,⁴³ since about the mid-nineties, and those subsequently used have not represented the maximum possible efficiency of this type of gear. It should be obvious, however, that variation in the size of the nets and the mesh has been permitted in accordance with the conditions of a specific

42. Western Out of Doors, Vol. V, (1928), p. 12.

43. In some regions a minimum length for nets has been established to prevent their use in small streams.

locality and the particular species sought.

Like the purse seine the gill net may be conceived as a curtain of webbing held vertically in the water between a corkline above and a lead-weighted line below, but the fishing procedure of the two methods bear scarcely any mutual resemblance. Gill netting has been prosecuted in two distinct ways--with drift nets and set nets and the difference is implied by the names. The first type which is usually largest is used adrift and the second type, often a fragment of a drift net, is staked or anchored in the current, generally in the upper reaches of a river. Drift gill netting is prosecuted usually in the estuaries of rivers and, if the water is sufficiently shallow, beyond the river's mouth.⁴⁴ Likewise, in great rivers such as the Columbia and the Fraser the nets may be employed at considerable distance upstream. The scene of operation for a river drift net is known as a "reach" or "drift"⁴⁵ and it must be a straight stretch of water in or near the current and of fairly uniform depth. The absence of snags or ledges is also requisite. If for any reason the water is discolored, the fishing may be done in daylight hours but, if the water is clear,

44. In certain areas, notably Bristol Bay in Alaska, the shallowness of the water permits gill net boats to operate successfully many miles at sea.

45. It is necessary before each season for the fishermen to clear their favorite reaches of snags and other obstructions and there is an unwritten law that no one who has not helped in this work shall be permitted to fish in that area. Plate XXXI in the Report of the Commissioner of Fisheries for 1888 shows the locations where each form of gear operated in the Columbia River during 1889 and the sites of all canneries. Plate XLIII gives the same information for Puget Sound.

fishing must be confined to the night when the salmon can not see the net. It may be said that, in general, night fishing has been most common in the states and in British Columbia while day fishing is most often allowed in Alaska because of the prevalence of mud and glacial silt in the streams.

In making a drift a distinctive type of boat is employed. The free end of the net is attached to a buoy and thrown overboard; then, as the boat moves slowly away the net is paid out over a roller at right angles to the current so that the incoming salmon will be intercepted.⁴⁶ Boat and buoy, with net between, drift for the time specified by local conditions. About an hour before high slack water is usually best for the start and the net is then hauled in an hour after the turn of the tide. Quite likely, however, both the high and low slacks will be fished, and some fishermen, under suitable conditions of tides and/or currents, have made as many as five drifts in a night. The net is hauled in over the roller, the fish are disentangled, and those not dead are clubbed on the head.

When, or by whom, the first gill net was used in the northwest salmon fishery is not definitely known but the credit, as far as white

46. The variations of handling gill nets are so many as to baffle description. Often the net is allowed to drift lengthwise with the current and, strangely enough, as many fish may be caught as though the net were drifted across the current. Two modifications of the gill net are the diver net and the trammel net. The first drifts along the surface. The latter is composed of two nets of different mesh fastened one behind the other.

men are concerned, may belong to H. N. Nice and Jotham Reed who established a salmon saltery at Oak Point, sixty miles below Portland on the Columbia River in 1861.⁴⁷ Mr. Nice fashioned a net fifty fathoms by three fathoms and with an eight inch mesh, from flax thread purchased at stores in the vicinity and spun into twine on an old-fashioned spinning wheel. Six hundred barrels of salmon were salted that summer which affords some index of the effectiveness of the net and, though the fact is unrecorded, it would appear to have been of the gill type.

Gill net fishing, however, may have begun long before white men came to the Columbia. The Indians living about the estuary are said to have used this method of taking the salmon that was their staple food.⁴⁸

At any rate, in the golden days of the industry which brought many canneries to that region in the decade or so following 1868, the gill net was the principal form of gear employed. Twenty years later three-fourths of the 2,000 or more fishermen on the Columbia were gill netters despite the introduction of other methods,⁴⁹ and in 1936 the gill netters still composed the majority of the fishermen employed on that river.⁵⁰

47. Collins, *op. cit.*, pp. 220-21. See also, Frances Fuller Victor, *All Over Oregon and Washington*, (San Francisco, 1872), p. 61, where the date given is 1851. -- typographical error?

48. "Evolution of the Columbia River Gillnetter", *Pacific Motor Boat*, Vol. XXXII, No. 3, (1939), p. 24.

49. Collins, *op. cit.*, p. 224.

50. R. H. Fiedler, *Fishery Industries of the United States*, (annual) 1937, U. S. Dept. of Commerce, Bureau of Fisheries, Administrative Report No. 32, (Washington, 1938), p. 378.

The report of the Oregon Fish and Game Protector for 1897-98 contains two paragraphs that reveal much information concerning the gill nets used in the Columbia River at that time.

. . . About 1,600 gill nets are employed in the drift fishery of the lower Columbia. The nets used . . . range in length from 250 to 300 fathoms, or more, but are mostly about 200 fathoms. They are 45 mesh deep (25 to 30 feet), the mesh being generally $8\frac{1}{2}$ to $9\frac{1}{2}$ inches. . . .

The nets are all hand made by the fishermen themselves or their families; the fishermen's union prohibits the use by any of its members of factory or Chinese made nets. Fine flax or linen twine is used; it has twelve threads and is laid slack. Hard twine would not 'fish well.' The nets are made between seasons . . . They are hung in the ordinary manner . . . and it is said they are tanned twice a month during the fishing season. The cost is about \$300, or \$1 per fathom. Nets ordinarily last two years but the fishermen generally expect to put in half new twine each season.⁵¹

Most particulars of this description would apply today.⁵² Though the union no longer makes an issue of the matter, at least nine out of ten gill nets are still hand made despite the fact that factory nets are admitted to be equally good and to cost no more when the labor devoted to hand made nets is considered. Even fishermen who are not independent and who are furnished their boat and other equipment by a cannery will yet be encouraged to use their own net, for there is a saying on the river of which the company is well aware, that a man rarely catches a steamboat in his own net.

51. Fifth and Sixth Annual Reports of the Fish and Game Protector, State of Oregon 1897-1898, (Salem, Oregon, 1898), p. 93.

52. The legal maximum length for Columbia River gill nets is now 250 fathoms. See Oregon Commercial Fishing Laws 1937-38, pp. 49-50.

Ships are a hazard to life as well as to the nets and the fishermen must exercise vigilance to avoid being run down in the narrow channels. Likewise, when drifting the lower reaches where the best fishing is ordinarily to be found, a change in weather is a danger. Since the introduction of power boats this has been greatly lessened but in the days of sail a serious toll of lives was taken. Again the Oregon Fish and Game Protector may be quoted:

Nowhere else in the region between San Diego and Puget Sound do the coast fishermen encounter such dangers or meet with such loss of life as on the Columbia. At times disasters have been appalling, . . . The most disastrous season was in 1880, when the fleet of boats was suddenly overtaken by a gale when near the mouth of the river; . . . Sixty lines were lost. The average loss of life is about fifteen annually, but there has been a very gratifying decrease in this particular in recent years, due chiefly to the efforts of the life saving service.⁵³

The great majority of the gill net fishermen operating in the rivers along the coast have homes along the stream and may supplement their income from fishing by farming or logging in other seasons. Men of all European and American nationalities engage in this fishery but, as with the others, Scandinavians would appear to predominate. The booklet issued in 1890 by the gill netter's union on the Columbia asserts that their membership was composed almost entirely of natural-

53. Fifth and Sixth Annual Reports of Fish and Game Protector of Oregon, op. cit., p. 101. See also, for this and for the general description of the gill net fishery, Columbia River Fishermen's Union, (Astoria, Oregon, 1890).

ized Scandinavians.⁵⁴ Older fishermen recall that in the days of sail there were varying numbers of Chinese gill netters on the Columbia but declare that they disappeared with the advent of power boats (about 1911). It may safely be assumed that gill netters, from the Fraser River southward, have long been the most numerous and most securely settled of the salmon fishermen and that they have contributed a full share to community and regional development.

The Fraser River, like the Columbia, is peculiarly adapted to a great gill net fishery and that method has been the one longest and most prevalently employed there. In 1864 Scotch trap nets were unsuccessfully employed and a change was made to drift gill nets.⁵⁵ Rathbun says that gill nets were in use on the Fraser "as early as 1875 at least."⁵⁶ The best fishing was within a few miles up from the river mouth or as far as the sand heads extended beyond it. Accordingly, most of the canneries along that river were erected within six or eight miles of the Strait of Georgia. By about 1890 the gill netters in that region used improved boats and thereafter made drifts farther into the strait.

The methods employed were little different than those in the Columbia except that the nets rarely exceeded 150 fathoms. That

54. Fifth and Sixth Annual Reports of Fish and Game Protector of Oregon, loc. cit.

55. F. W. Howay, British Columbia from the Earliest Times to the Present, (Vancouver, B. C., 1914), cited by Rounsefell and Kelez, p. 702.

56. Rathbun, op. cit., p. 306.

length became the legal maximum in 1908 but 200 fathoms were allowed after 1930. Set nets have not been permitted in the Fraser but, in any case, there are very few localities adapted to their use. As early as 1882 a minimum size for the mesh of sockeye nets was established at 5 7/8 inches. In 1916 the minimum was lowered and then abolished in 1928.⁵⁷ During early years in British Columbia all gill netting was done by Indians from canoes or skiffs but by 1882 white and Japanese fishermen outnumbered the natives employed. The majority of whites and Japanese, it appears, used the distinctive round-bottomed, centre-board boat introduced from the Columbia River⁵⁸ --in 1890, according to Rathbun.⁵⁹ The first powerboat appeared in the Fraser River gill-net fleet in 1902 but motorization was not completed until 1914.

In 1888 the Indian fishermen lost their numerical majority when the first Japanese were hired for contract fishing.⁶⁰ Rounsefell and Kelez have made an interesting study of the relative fishing efficiency of the three races employed by one cannery from 1905 to 1916 inclusive. For this twelve-year period the average annual catch for individual Japanese fishermen was 1,782 sockeyes, for white fishermen 1,057 sockeyes, and for Indians 768 sockeyes.⁶¹

Gill nets have been used in the various areas of Alaska where they could serve, especially around Copper River and in Bristol Bay.

57. Rounsefell and Kelez, op. cit., p. 709.

58. Ibid., p. 707.

59. Rathbun, op. cit., p. 307.

60. Rounsefell and Kelez, op. cit., p. 705.

61. Ibid., p. 706.

They followed the canneries to those regions and the method remained the same as in the south. In Bristol Bay in the Bering Sea, the greatest remaining reservoir of sockeye or red salmon, and in other limited areas of Alaska, gill nets have been the only form of gear permitted since 1930. Either drift or set nets are allowed. The law requires that the boat used in drifting be propelled by sail or oars. The two-man crew cook and sleep in their twenty-eight or twenty-nine foot boat for the season lasting twenty or twenty-two days. Most of the fishing is far from shore and deliveries must be made once in twenty-four hours to a scow which is sent out and for which motor-power has been allowed. All boats and gear are provided by the canning companies.

"The boat used in the river and coast gill-net salmon fishery of the Pacific is a distinct type, and differs from any other small craft employed in the fisheries of the United States."⁶² Those words, written fifty years ago are descriptive of a boat long known as the Columbia River type because of its early prevalence there. It has spread to every point where the gill net fishery is prosecuted and after seventy years of fishing history it still remains a workboat peculiarly adapted to its job.

The origin of the design has evoked much dispute, some maintaining that it was brought to the Columbia from the Sacramento River by

62. J. W. Collins, "The Fishing Vessels and Boats of the Pacific Coast", Bulletin of the U. S. Fish Commission, Vol. X, (1890), 52nd Cong., 1st Sess., H.R. Misc. Doc. No. 341, p. 38.

the first canneryman, while others declare it a combination of the concepts of Clatsop Indians and of Scandinavian fishermen. Its resemblance to the fishing craft used on the Norwegian coast since viking times is indeed striking and nothing would be more natural than for the Scandinavian fishermen who flocked to the region in early times to apply their traditional methods. Yet, an investigator from the United States Fisheries Commission in 1890 asserted that the first boat of this type was brought to the Columbia in 1869 by George and Robert Hume, the pioneer salmon canners of the Sacramento and Columbia Rivers.⁶³ The builder was one J. J. Griffin of San Francisco who, the previous year, had constructed a similar model for a Sacramento River fisherman known only as "Greek Joe". It is further stated that as late as 1890 "many of these boats were built at San Francisco, but large numbers were also constructed on the Columbia River." Prior to 1888 both the boats and the nets were owned by canneries and rented to the fishermen, but after that date the operators encouraged ownership by the fishermen, especially of the nets, for it was thought that they would be more considerate of their own gear.⁶⁴ The following description of a sailing gill-net boat has been given by Collins:

It is an open, carvel-built, centerboard craft, sharp forward and aft, the ends being shaped nearly alike. . . . It has a long, low floor, round bilges, flares slightly at the top. It has a very shallow keel, little or no rake to the stem and stern post, both of which are

63. Loc. cit.

64. Collins, "Report on the Fisheries of the Pacific Coast", op. cit., p. 206.



Fig. 13. Columbia River sailing gill-net boat, 1901. This distinctive boat was used all along the northwest coast until the introduction of motor power approximately thirty years ago. In certain gill-net fishing areas today the law requires the use of these sailing craft as a conservation measure.

straight with the exception of the rounded forefoot. The final
It is decked 2 or 3 feet at each end. It has washboards
... along both sides. A coaming 2 or 3 inches high
runs around the inner edge of the washboards and the
decked spaces ... making the open part of the boat
an oval form. ... A single mast is ... stepped
well forward. Oars are carried when there is no wind.⁶⁵

The average overall length was twenty-four feet, the beam about $6\frac{1}{2}$
feet, the height amidships (gunwale to bottom of keel) $2\frac{1}{2}$ feet, the
depth two feet and the height at the ends three feet.

In the earliest days a lug sail or a leg-of-mutton sail was used
but after about 1880 a sail rig unique as the boat it propelled became
universal. The single mast, 16-18 feet long, was stepped in a ring
on a forward thwart and the sails and rigging could be taken down
easily for fishing or to provide shelter for the two-man crew by
stretching the sail over the lowered mast serving as a ridge pole.

The sail that endured until displaced by the motor was of the sprit
type, held at the foot by a boom long as the boat and extended at the
peak by a sprit angled from the mast. In strong breezes the sprit
could be removed and the sail reefed by simply hauling the peak to the
mast. In fair weather a spinaker or "stunsail" was sometimes added.

Rarely could these sail boats make more than one drift in a night
but they did all the fishing until the first power gill-net boat
appeared on the Columbia in 1903.⁶⁶ Indeed, for the better part of
the ensuing decade the fishermen clung to sail because of their con-

that time there came a demand for more speed. The salmon runs in the

65. Collins, "Fishing Vessels of the Pacific Coast", op. cit.,
p. 39.

66. "Evolution of the Columbia River Gillnetter", op. cit., p. 25.

viction that the noise of motors would "scare the fish". The final abandonment of sails in favor of engines around 1910-12, and the more recent demand for speed, have been the chief factors in modifying the design of the boat. With the introduction of power the average boat became slightly larger. A beam up to nine feet accommodated larger nets and more fish and flare at the bow was increased to prevent water being shipped as the power boat proceeded against the chop. The maximum length, however, generally remained at twenty-six feet for the law required side lights for boats of greater length and the fishermen saw only work and expense in such lights.

Power also was responsible for a greater number of one-man boats.

A small cabin was added first amidships or forward which housed the motor and the skipper. Subsequently, however, it was discovered that with a power boat the most efficient handling of the net was no longer from the stern but from forward and thereupon the cabin was shifted to the stern and the net stowed and operated from the forward half. Power from the motor was applied to the roller over which the net was handled and the toilsome task of net pulling was facilitated. Such power rollers were called "live" rollers in contradistinction to the old "skunk" rollers. The earliest motors were about four horsepower but by about 1928, eight to ten was most common. Then, at about that time there came a demand for more speed. The salmon runs in the Columbia had dwindled noticeably and the fishermen sought to get in an extra drift or two on nights when the fishing was best.



Fig. 14. Columbia River gill-net boat, 1925. The arrangement shown was the one most in favor for the first twenty years or so, following the introduction of power.



Fig. 15. Columbia River gill-net boat, 1936. The arrangement favored for the last decade is shown. Note that the space for the net has been shifted from the stern to the bow.

Accordingly the first major change in the lines of the boat were made. The old double ender was quite adequate for chugging along at low speeds but when more powerful motors were installed their effect was largely wasted, for when they were opened to high speed the sharp stern tended to suck down into the water and create "drag". The solution was a square-stern craft and all the new boats of the last four or five years have been in that fashion. Forty-five to eighty-five horsepower gasoline engines are installed in such boats. The average speed developed is from twelve to twenty miles an hour. The boats have grown to a maximum length of thirty-feet but the beam has not been increased. Within a few years more the double-ender which served so many years will have probably disappeared from competition but the new type is no less distinctive and no less seaworthy.⁶⁷

MINOR FORMS OF SALMON GEAR

The four major methods which have been used to catch salmon have been discussed. With the exception of the purse seine they were all employed in primitive form by the Indians before white men came to the northwest. Additional methods--fish spears, bows and arrows, dip nets, squaw nets, and reef nets were likewise used by the natives and most of them are still in use where the Indians fish in their traditional way. White men, too, have probably tried all these methods but, in

⁶⁷. The writer has seen one of these boats fishing for tuna forty miles off the Oregon coast.

most instances, with results of negligible commercial importance. Two other minor forms of gear--drag seines and fish wheels, were introduced by the white invaders but they have, for the most part, fallen into disuse while one of the Indian methods has recently enjoyed a localized resurgence.

Reef nets, employed by Indians in catching salmon were noted by eighteenth century explorers of the Puget Sound region and the sailors may have compared the Native gear with the similar form used on the North Sea where fish schooled on the reefs. When Vancouver explored Puget Sound and the Straits of Georgia he found more than five hundred Indians encamped at what is now Point Roberts, and which was for years a most productive trap fishing area, engaged in catching salmon with crude nets made from the bark of the young willow. Mr. A. J. Kerr, who was engaged in the Puget Sound salmon fisheries for many years, has left an account of the methods of making reef nets such as he believed Vancouver saw and which differ little from those still used except in the materials from which they are made.⁶⁸

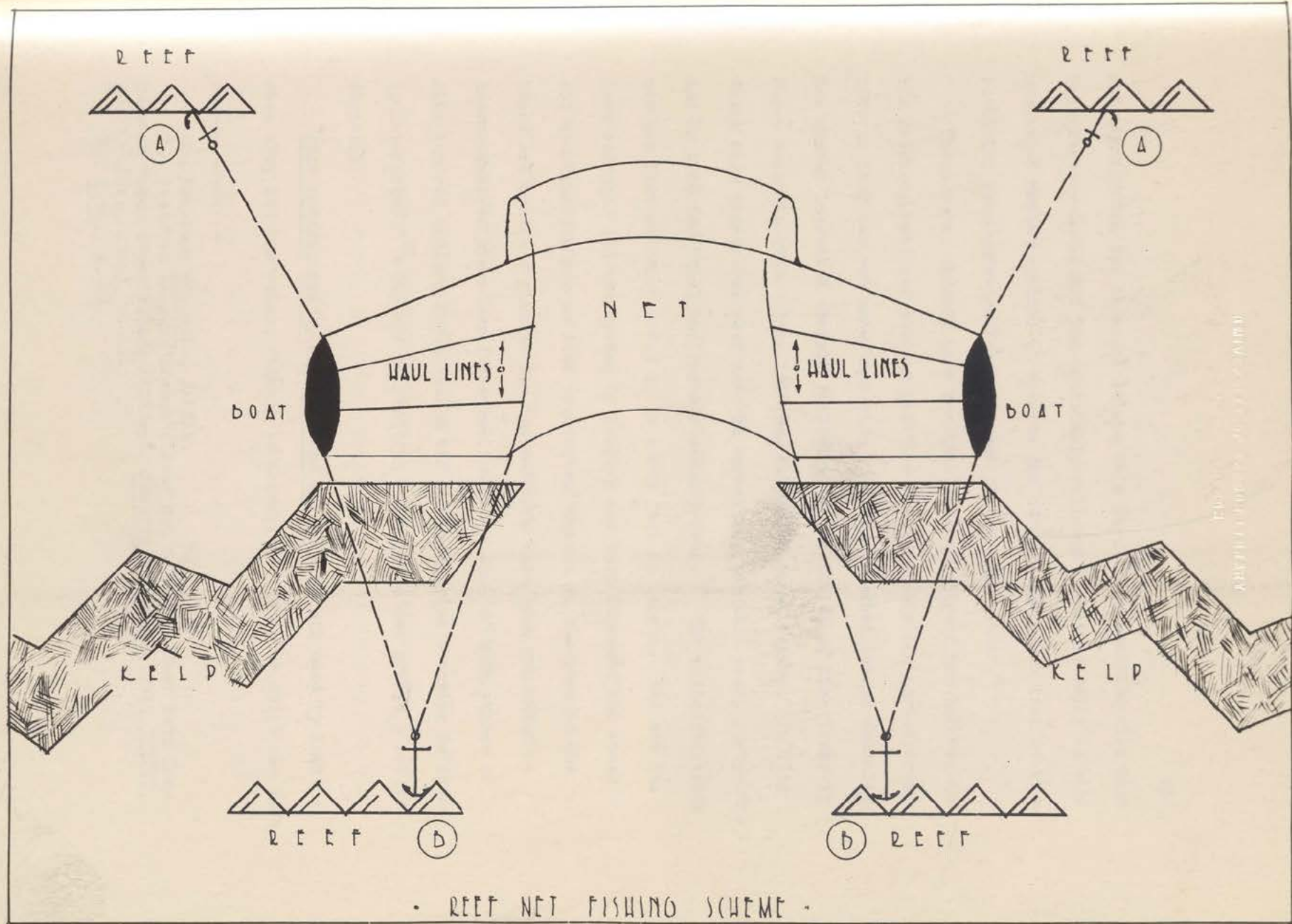
The name was derived from the kelp-covered reefs where the net was adapted. Few such reefs, however, lie, as is necessary, directly in the path of sockeye runs. Formerly the nets were made of twine spun from the inner fibers of willow bark and the ropes used with them were

68. "The Siwash Reef Net", Pacific Fisherman, 1917 Yearbook, p. 60. Collins, Report, op. cit., p. 260, writing about 1890 says, regarding the origin of the reef net, that Indians declared it to have been introduced by Hudson's Bay men.

twisted from the fiber of cedar roots. When traders introduced cotton or linen twine the nets were probably enlarged but the usual size was, perhaps, thirty-five to forty feet long and from twenty-five to thirty feet across, the mesh being about three and one-half inches.

When schools of sockeyes were observed to cross a certain reef consistently, preparations for fishing there were made by cutting a channel through the kelp. The net was then suspended between two canoes, anchored at, and parallel with, the sides of the passage. Suspension of the net was accomplished by means of several hauling lines leading from each canoe, and these were so adjusted that the front end of the net, facing the current, would sink near the bottom while the back end curved toward the surface. The channel in the kelp served to direct the fish into the net blocking the passage and the channel was further lengthened by leaders made up of the cut kelp.

The salmon schools came with the current and had to be observed by a watchman posted in the bow of each canoe. The fish were not gilled in the net and nothing prevented their escape but skillful handling of the haul lines. At a shout from the watchman the net had to be hauled instantly. The buoyed stern anchors were promptly let go, permitting the canoes to swing together as the men jumped to the haul lines and hoisted the net in a sort of a bag. Success depended upon speed and perfect coordination of the six or eight men. The catch was dumped into the canoes, net and canoes were once more adjusted and the vigil was resumed. Rathbun, writing in 1899, reported that a single



net might catch two thousand salmon in a day.⁶⁹ He remarked also that this fishery could not "be profitably followed by whites owing to the number of hands required to operate the net and the great loss of time resulting from unfavorable conditions of sea and weather."

There were, indeed, more profitable forms of gear but Rathbun in his prophecy reckoned without politics. For, though the period from 1909 to 1932 saw not more than nine reef-net licenses issued annually, the number increased sharply following the abolition of fish traps in Puget Sound in 1934. Thus 1935 saw twenty licenses issued. In 1936 there were thirty-two reef nets in operation, the next year, forty-nine, and in 1938 the total had reached seventy-four.⁷⁰ The white fishermen now use flat-bottomed boats up to forty feet in length. The net has been enlarged and the system of leaders has been improved but speed and coordination are no less requisite. Towers in the bows of the boats and polaroid glasses for the watchmen have been the chief innovations of these new fishermen, but with some of them shares of five hundred dollars for a season and the "canneries becoming definitely interested,"⁷¹ the end of fruitful experiments has probably not yet arrived.

Fish spears, gaffs, and bows and arrows were all used by Indians when they had the salmon fishery to themselves, and they still use such

69. Rathbun, *op. cit.*, p. 314.

70. Beatrice Annette Lowman ("Reef Net Betty"), "Reef Nets Come Back in Puget Sound Salmon Fishery", Pacific Fisherman, Vol. XXXVII, No. 7, (June, 1939), p. 45.

71. *Ibid.*, p. 63.

appliances in some rivers where the salmon run. With the exception of a very few Alaskan streams practically all fish taken by these methods have been consumed by the fishermen themselves.

Indian traps were once common over the whole salmon region, but they are now confined to Alaskan streams where the Natives utilize the catch for their own food. The ingenuity of the Indians in fashioning traps excited comment from many early travellers in the northwest.⁷² The development by whites of one form of native trap into an appliance of commercial importance in the early period of the Columbia River salmon canning industry has previously been alluded to.⁷³

Dip nets and squaw nets⁷⁴ are two more forms of native gear which greatly aided the Indian in rounding out his economy; and which have been used by whites but have had only moderate commercial importance. These are the methods which the modern observer along the Columbia is most likely to witness in the hands of Natives fishing in their traditional manner.⁷⁵

The dip net is extended by a hoop fastened to a long pole and they have been operated from platforms constructed over falls and rapids in the streams, (as at The Dalles, Oregon) but in earlier times any spot

72. Charles Wilkes, Narrative of the United States Exploring Expedition, (Philadelphia, Lea and Blanchard, 1845), Vol. IV. Chapters IX to XIV probably contain more detailed accounts of various native fishing methods than any other early work.

73. Supra, p.65.

74. See Cobb, op. cit., p. 479.

75. Wilkes, op. cit., p. 384, gives the impression that spearing and gaffing were the most common, if not the sole methods used by Indians at The Dalles to take salmon in his time.

at which the salmon habitually came close to shore was a favored point for the Natives and was relinquished only in the face of appropriation to other forms of gear by whites.

The squaw net got its name from the fact that it was operated by Indian women on approximately the same sites as dip nets. Its use has been circumscribed by the same causes. Virtually, it was a set gill net rectangular in shape and about twelve by fifteen feet. The lower edge was heavily weighted while the upper was suspended from a floating pole. A spar projecting from the shore held it in position at right angles to the current. Between float and spar a tackle was rigged to facilitate hauling the net.

The fish wheel is generally considered to have been unique to the salmon fishery and it was of great commercial importance only on the Columbia River where it was invented.⁷⁶ The year 1879 witnessed its appearance as a patented device, 1927 saw it legislated out of Oregon waters, and "Initiative 77" in the state of Washington cast it into virtual oblivion in 1934. In both states conservation sentiment regarded it as a "destructive" form of gear. Today it exists only as an appliance in the hands of Alaska Natives who use most of the catch for non-commercial purposes.

In principle the fish wheel was simply a mechanical application of the Indians' dip net to the white man's water wheel in such fashion

76. Cobb, op. cit., p. 485 says, however, that a similar contrivance was in use on the Roanoke River of North Carolina before the Columbia River device was patented.

that one dip net was always in the water. The method was employed only in those limited areas where the channel of the fish was narrow and the water swift. Consequently the fish wheel was used almost entirely in that section of the Columbia near Celilo and the Cascades. There were two forms--the shore wheel and the scow wheel, but the method of operation was exactly the same. A wheel, up to forty feet in diameter and with three or more trough-shaped dip nets hung on its horizontal axis, scooped out the salmon as it turned with the current against which the fish swam. The shore wheel was on a permanent foundation of rock or cement and straddled a channel into which the salmon were often artificially deflected by a leader. What the scow wheel lacked in permanence of installation it made up in mobility and in adaptation to various stages of the river level.

Mr. G. W. Williams who, with his brother, patented the device reported that one of the first wheels caught 85,000 pounds of salmon in a single day.⁷⁷ Such phenomenal catches were never typical and the rapidly multiplying units of this and other forms of gear were instrumental in decimating the salmon runs until wheels rarely caught so many fish in an entire season.⁷⁸ The Williams brothers enjoyed their monopoly but three years for the courts declared the patent invalid. In 1898, the peak year, a total of seventy-one wheels fished on the Columbia.⁷⁹

77. Oregon Fish and Game Protector, op. cit., p. 96.

78. Loc. cit.

79. Loc. cit.

Some operators had a unique method of delivering their catches to the canneries. The salmon were lashed together in bunches weighing about eight hundred pounds and secured to an air-tight keg bearing the operator's name. Keg and fish were set adrift to be observed by a lookout man with field glasses at the cannery downstream who signalled a boatman-retriever.

No significant improvements were made in the fish wheel after its first introduction.

Drag seines (also called haul seines and beach seines) have been extremely effective in catching salmon in those very limited areas of the Columbia River, Puget Sound and Kodiak Island in Alaska where they have served. Indeed, were the locale of their use less circumscribed, they would probably have to be treated as a major form of gear. Operations on the Columbia River have been conducted only upon the shallows and sand bars which dry at low tide and nearly all of these are within fifteen miles of Astoria. The date at which this gear was introduced is unknown but it had occupied all available sites by 1889.⁸⁰

The outfit of a seining gang included, besides the net itself, boats, warps, horses, and buildings upon pilings where horses and men could retreat at high tide. Ten to sixteen men and eight to eighteen horses have comprised a seining gang, and many crews have captured over two hundred tons of salmon in a season.⁸¹ During the fall runs in the

80. Collins, Report, op. cit., p. 203. James G. Swan in The Northwest Coast, (New York, Harper Brothers, 1857), pp. 104-7, describes a form of drag seine made and used by Indians in the employ of one Bill M'Carty at Chinook, Washington, in 1852.

81. Oregon Fish and Game Protector, op. cit., p. 94.

Columbia, drag seines have caught more fish per unit of gear than any other method.

This is one of the most ancient forms of net in existence. Jesus and his fishermen disciples were familiar with it on the Sea of Galilee,⁸² but the scale of its operations on the Columbia would have amazed them. There they would have found the net ranging from one hundred to four hundred fathoms in length and with a bunt at the center up to fifty fathoms long. Anadromous fish such as the salmon would have been strange to them, tide water would have baffled them, but the method of handling the net would have been understood.

The most successful time for dragging a seine was slightly after the tide started to flood, bringing in the salmon. Two boats, a seine boat and a dory were employed. The first carried the net and both took station together some distance off-shore. The shore or shallow end of the net was attached to the dory and at a signal the two boats parted, the dory heading toward shore while the larger boat circled around against the tidal current paying overboard the deep end of the net to form a barrier against the migrant fish. The salmon were not gilled and all the work was accomplished as swiftly as possible to prevent the catch from finding an outlet below the lead line. The boat crews would jump into waist-deep water to rush the ends ashore where horses were hitched on to haul the heavy net. While one team

82. William Radcliffe, Fishing From the Earliest Times, second edition, (New York, E. P. Dutton, 1926), note, p. 423.



Fig. 16. Columbia River seining crew making a haul, 1926. The horses in the distance, at the extreme left, are pulling the opposite end of the same net shown in the foreground.

pulled another was driven into the water and hitched farther back so that the movement would be continuous; always the net was worked against the tide as much as possible. The method employed on Puget Sound and Kodiak Island was practically the same.⁸³

Little improvement has been made with this method since its adoption by salmon fishermen. Motor-powered boats have only lightened a part of the work and expedited the circling with the sine so that fewer fish have escaped.

Drag seining has never been an enterprise for the individual fisherman on the Columbia. The available sites were all bought from the state by the end of the eighties for merely nominal sums but subsequently they grew valuable.⁸⁴ The number of seines in use has averaged around forty,⁸⁵ but they have been divided among not more than half a dozen fishing companies. The employees have usually been paid wages for the first three months of the season, and wages plus shares for the final month when the fishing with this gear has generally been best.

83. Cobb, op. cit., p. 479.

84. Collins, Report, op. cit., p. 203. Since fish wheels have been abolished, drag seines are the sole form of gear unreservedly monopolizing a particular fishing site. Fish trapsites, so often indicted on this score, must be licensed annually and occupied continuously in order to be held. It would appear, however, that in practice a license counts as occupancy.

85. R. H. Fiedler, Fishery Industries of the United States, 1937 (annual), U. S. Dept. of Commerce, Bureau of Fisheries, Administrative Report No. 32, (Washington, 1938), p. 378. This work provides an excellent statistical background for the salmon fisheries of the United States. Bower, op. cit., covers the Alaska fisheries.

COMPETITION BETWEEN SALMON GEAR

Of the various methods of catching salmon which have been discussed it may be reiterated that only four have been, and remain, of major significance to the industry as a whole.⁸⁶ Three of these, the gill net, the purse seine, and the trap have sustained the canning operations; while the remaining method, trolling, has developed to the chief support of the fresh, frozen, and cured salmon trade.

It has been shown that these fishing operations have been extended along a tremendous stretch of coastline during the seventy years of the industry, and that the catches have always been made with a great number of gear units. The fact that the salmon are limited by nature in any given season, and that this natural order has been defended by governmental regulations which, in general, have somewhat balanced the gear competition by encouraging continued but restricted utilization of the various appliances has joined force with the extreme perishability of the raw material to insure that the fishing operations did not become overly monopolistic. A related factor has been in the circumstance that individual property rights in fishing locations have rarely been granted, even where such was possible. Despite the fact that traps, which in Alaska catch about half of the salmon canned, have acquired semi-permanence as regards location, the legal title of their owners

86. It is noteworthy that sport fishermen often catch a greater total of salmon in a particular year than do some of the minor forms of commercial gear. Compare tables of catch by gear in Annual Bulletin, Department of Fisheries, State of Washington, Bulletin No. 39, (1939).

to such sites is obviously far more tenuous than those which have been enjoyed by owners of farms and mines, or even of the riparian rights associated with farming and mining. Thus the natural and legalistic boundaries within which the industry has grown have been an obstacles to monopoly of fishing operations. True, the great geographical dispersion and the remoteness of the operations has handicapped the small canner more than his larger competitors but these same conditions have, in many cases, hindered control of the men who have caught the salmon.

For the further defense of the fisherman has been the fact that gear and methods have remained relatively simple and rarely more than moderately capitalistic. All methods have required considerable hand labor and the fishermen appear to have generally been able to keep abreast of technical improvements and rising cost of gear. The greatest change has resulted from improved transportation, effected by the gasoline or oil engine, and here the generalization just made may require some qualification. The initial investment in many cases may be difficult for the fisherman to make but, on the other hand, the very fact that modern purse-seine boats, an extreme example, cost from \$8000 to \$25,000 have been largely owned by the fishermen⁸⁷ is some evidence that the "little man can still win"; and that the methods and environment of the salmon industry have not concentrated the fishing under

87. No adequate figures are available. Some purse-seine boats are owned outright by canneries which hold mortgages on many more. Fishermen interviewed were of the opinion, however, that more than half were privately owned.

monopolistic control by canneries. To put it simply, opportunity for the individual fisherman has, in general, kept pace with the expanding industry and gear competition has been a part of the natural setting.

Overwhelming numbers of a single form of gear in a given locality would not, moreover, be monopolistic unless a preponderant part of the total salmon catch was made in that area. Such a contingency has been prevented, it may be repeated, by nature and by law, both in specific areas and in the whole salmon region of North America. The following table shows that the Alaska fisheries, where the tendency toward monopoly is greatest, and which has long accounted for more than half of the world's salmon pack, presents no danger of gear monopoly. The percentages of the annual regional catch of salmon in Alaska by types of gear during the years 1922-37 are presented:⁸⁸

Gear	Southeastern				Central				Western			
	1922	'27	'32	'37	'22	'27	'32	'37	'22	'27	'32	'37
Purse seines	36	16	20	29	28	29	15	39	6	4	5	4
Gill nets*	2	6	2	3	7	8	10	8	90	92	90	95
Traps	60	70	74	65	65	63	75	53	3	1	--	--
Trolling	2	8	4	3	--	--	--	--	--	--	--	--

Now that the physical setting, the salmon, and the methods of catching them have been discussed, the history of the industry itself, as yet touched only at the extractive level, will be treated more ex-

88. Gregory and Barnes, op. cit., p. 87. (Figures from Bower, op. cit.)

* This is the sole form of gear permitted by federal statute in Bristol Bay which comprises most of the western fishing district and which is under strict regulation in an effort to maintain the only remaining great reservoir of sockeye or red salmon.

tensively. Because the change in economy, delineated roughly, in the history of the salmon region coincided approximately with a change, sharply marked, in the methods of preserving salmon the treatment of the industry will be divided into two parts accordingly. The shift in focus is to the days when white men in the Northwest lived under a semi-feudal or pioneer economy and when all salmon were still taken by redmen using their traditional gear.

CHAPTER IV

THE SALMON INDUSTRY BEFORE 1864

We . . . do give, grant and confirm, unto the said Governor and Company . . . the sole trade and commerce of all these seas . . . with the fishing of all sorts of fish . . .

Royal Charter of the Hudson's Bay Company, 1610

I have no good news to impart . . . The salmon part of the business will never do.

Nathaniel Wyeth from the Columbia River, 1835

If the tale is true that a Japanese fisherman, shipwrecked on the Kamchatkan coast and transported to the presence of the Czar for the curiosity of the event was one of the reasons prompting Peter the Great to undertake explorations in the North Pacific,¹ then that Japanese cast a shadow, however dim, when the Dane, Vitus Bering, landed on Alaskan soil in 1741. The shadow loomed much darker two centuries later when, in 1937, Japanese floating canneries invaded the sockeye or red salmon fisheries of Bristol Bay.² The fact that George Wilhelm Steller, the German botanist who had properly classified the Pacific salmon in Siberia four years earlier, landed from Bering's ship very much in substance and immediately identified a quantity of sockeyes found in an Indian cache on Kayak Island, provides the earliest record of the raw material of a major industry in northwestern America.³

1. Congressional Record (appendix) 75th Cong., 1st Sess., Vol. 81, pt. 10, (Washington, 1937), p. 1431.

2. Ibid., p. 1241.

3. F. A. Golder, editor, Bering's Voyages, two vols., Vol. II, Steller's Journal . . . on the Second Expedition, translated by Leonhard Stejneger; American Geographic Society Research Series No. 2, (New York, 1925), p. 48.

A Spanish soldier, Juan Bautista Anza, provides the earliest discovered mention of salmon within the territory now included in the United States proper. While leading an expedition from Sonora to San Francisco he recorded in his diary during March, 1776, that the Carmel River in California abounded with salmon.⁴ He seems to imply, however, that little effort was made to catch them despite periods of want at the Carmel mission.

But the story of the salmon industry in the first part of the nineteenth century concerns neither Russian nor Spanish enterprise; it is a record bound closely to the history of territorial expansion of the United States and England. The commercial exploitation of the Oregon country and New Caledonia in the early period was, for the most part, confined to the activities of the Hudson's Bay Company and the Northwest Company. These two rival companies subsequently merged. Though Indian lore and marvelling accounts of travellers are replete with tales of salmon, it was the men of these two companies who first experimented with the preservation of salmon that those fish might form a palatable supplement to the winter larders of trading posts, or go to market through the channels already established for furs.

Both William A. Slacum,⁵ President Andrew Jackson's special commissioner, and Lieutenant Wilkes⁶ of the United States Navy have attested

4. Cited by Katharine Coman, Economic Beginnings of the Far West, (New York, Macmillan, 1912), Vol. I, p. 130.

5. "Slacum's Report on Oregon", Oregon Historical Quarterly, Vol. XIII, (1912), p. 185.

6. Op. cit., p. 392. Wilkes remarks on more than one occasion that the Company diet of salmon, peas, and potatoes was hardly sufficient; see especially p. 329.

that salmon were a staple food at Fort Vancouver. It appears that Governor Simpson of the Hudson's Bay Company first conceived the idea of packing salmon for market. After previous overtures in England he proposed in 1828 to a ship-captain in the employ of the Company that he, Simpson, would provide barrels if a market could be found; and two years later his instructions to McLoughlin at Vancouver contained a similar proposal with an offer of coopers and nets.⁷ Doubtless, Archibald McDonald at Fort Langley on the Fraser River received identical instructions at about the same time, for he reported in a letter dated in 1831 that he was "preparing 2 to 300 barrels to be at the salmon immediately at the commencement of the season." He mentioned that a cooper was supposed to be on the way and remarked that "in consequence of my Casks of last season losing all the pickle, the Dr. [McLoughlin] sent none of them to market but sent his own and kept ours for home Consumption."⁸

7. Quoted by S. E. Morrison, "Columbia River Salmon Trade", Oregon Historical Quarterly, Vol. XXIII, (1922), p. 112.

8. "Letter of Archibald McDonald", Washington Historical Quarterly, Vol. I, (Oct. 1906-July 1907), p. 258. S. A. Clarke says, however, in his Pioneer Days of Oregon History, Vol. I, (Portland, Oregon, 1905), p. 197, that 7,544 salmon were bought at Fort Langley from Indians at less than a cent per fish in 1829, and he dates the shipment of pickled salmon to London from that time. F. W. Howay in his History of British Columbia, as cited by Rounsefell and Kelez, op. cit., p. 701, says that "3 to 4 thousand barrels" of salmon were being shipped yearly to the Hawaiian Islands by 1835. Rathbun, op. cit., remarks that salmon salting (probably for local consumption only) was begun by the Northwest Company "soon after 1800."

The spoilage to which McDonald alludes was to remain the curse of the salmon industry for many years.

The salmon accompanied lumber and agricultural products to markets in California, Russian America and the Hawaiian Islands. By 1847 at least half of the total investments of the Company were accounted for by industries not essential to the fur trade.⁹ McLoughlin had himself written in February, 1830, that there was a good market for timber in the Sandwich Islands and observed that salmon might very well be made an additional article of that trade.¹⁰ Twelve years later, however, (1842) Sir George Simpson wrote from Honolulu and his remarks imply that the salmon fisheries of Forts Vancouver and Langley had not been exploited to the full possibilities of this trade. He said:

. . . the demand for that fish is encreasing and promises to become very great, both for the United States and the China market, commanding now at the Sandwich Islands from \$10.00 to \$12.00 per barrel of 180 lbs. I think the salmon fisheries of this coast are highly deserving of attention as a growing and almost inexhaustible source of trade.¹¹

In seeking such markets for their fish the Hudson's Bay men only exhibited their ordinarily great commercial ability, but in actually

9. Robert Carlton Clark, History of the Willamette Valley, Oregon, (Chicago, S. J. Clarke, 1927), Vol. I, p. 204.

10. C. M. Gates, Editor, Five Fur Traders of the Northwest, contains Journal of Archibald N. McLeod, (Minneapolis, University of Minnesota Press, 1933), p. 124.

11. Joseph Schafer, editor, "Letters of Sir George Simpson, 1841-1843", American Historical Review, Vol. XIV, (1908), No. 1, p. 84. In this same letter Sir George advocated also the establishment of a whaling base on Vancouver Island. Alexander Mackenzie in his abortive "Fishery and Fur Company" had envisioned the same project in 1803.

selling salmon to the Russians in Alaska they demonstrated an unusual talent for salesmanship. A contemporary observer, after listing the points where Company salmon were an article of trade added: "They are also supplied to the Russian settlements according to contract."¹²

Nor were the Hudson's Bay traders alone in foreseeing profits from the salmon trade. Several Americans tested the Company's virtual monopoly in the Columbia River region. During 1829 and 1830, the same years that Simpson and McLoughlin projected extended fishing operations, the American brig Owhyhee owned by Josiah Marshall of Boston and commanded by Captain John Dominis, traded in the Columbia and in the second year pickled fifty-three barrels of salmon. Thus, the first American vessel in the river since 1814 carried the earliest shipment of north-western salmon to the Atlantic coast, and because they came from territory declared not a part of the United States, nor "claimed as a territory of the United States", they paid a tariff. Moreover the pack was of poor quality and sold slowly.¹³

In the following year, Captain Thompson who had been in the schooner, Convoy on the Columbia at the same time as the Owhyhee in 1830,¹⁴ sailed with the Sultana from Boston carrying a thousand barrels in the hold, bent on packing salmon and trading for furs again on the Columbia. This venture met with little more encouragement than the last as far as the

12. C. G. Nicolay, The Oregon Territory, (London, Charles Knight, 1846), p. 207.

13. Samuel Eliot Morrison, "New England and the Opening of the Columbia River Salmon Trade", Oregon Historical Quarterly, Vol. XXVIII, (1927), p. 111.

14. F. W. Howay, "The Brig Owhyhee in the Columbia, 1829-30", Oregon Historical Quarterly, Vol. XXXV, (1934), pp. 10-11.

salmon were concerned.¹⁵

The major invasion of the Hudson's Bay Company fisheries came, however, in the mid-thirties under the leadership of another Boston man, Nathaniel J. Wyeth.¹⁶ He had been attracted and then disillusioned by that Oregon enthusiast, Hall J. Kelley, and gave up a lucrative ice business for what he believed a good opportunity to develop a trade such as might rival that of the Hudson's Bay Company itself. No efforts were spared in an attempt to perfect the details of equipment and organization, and while the Sultana sailed to meet him with a cargo of goods, Wyeth led a party overland in 1832. Upon his arrival at Fort Vancouver in the autumn, Dr. McLoughlin welcomed him but had disheartening news. The Sultana had become a total loss among the Society Islands.

Meanwhile the Hudson's Bay Company had grown concerned over the prospects of American competition and made plans to meet it. This, together with the loss of the Company ship, William and Ann at the mouth of the Columbia, was probably the reason that one Donald Manson was sent to rebuild Fort George as a vantage point from which to both aid company ships and watch Americans. Some significance is borne by the fact that in two letters addressed to Manson, McLoughlin requested an account of the number of salmon salted.¹⁷

15. Loc. cit.; see also Dunn, op. cit., p. 162, for an account of Thompson's difficulties and the manner in which McLoughlin saved him from an Indian attack.

16. Coman, op. cit., pp. 118-24; also F. G. Young, The Correspondence and Journals of Nathaniel J. Wyeth, 1831-6, (Eugene, Oregon, The University Press, 1899).

17. Grace P. Morris, "Development of Astoria, 1811-1850", Oregon Historical Quarterly, Vol. XXVIII, (1937), p. 421.

Wyeth, back in Massachusetts after a winter at Vancouver as McLoughlin's guest, successfully launched his second venture in the Northwest. The Columbia River Fishing and Trading Company was organized and in 1834 a second vessel, the May Dacre, was sent around the Horn with supplies, while Wyeth again proceeded overland.

Upon his arrival at Vancouver the second time, he learned that the May Dacre had been struck by lightning and delayed so long at Valparaiso that she had only the day before entered the river. The arrival of the ship three months behind schedule forfeited the salmon season for that year. The bolt of lightning was no more the last than the first of Wyeth's misfortunes. Courteous but firm competition from the Hudson's Bay Company thwarted him in the fur trade and when, the following season, salmon packing was finally undertaken, that, too, proved discouraging. Indians failed to supply fish fast enough for the smoking process so that the May Dacre stowed but half a cargo and the quality of that was inferior. Wyeth hung on until the fall of 1836 when he sold out to the Hudson's Bay Company, returned to Boston, and eventually accumulated wealth in the ice business again.

Despite the persistence of the man and his backing by Boston financiers, Wyeth's venture failed for the reason that most independent packing ventures failed. Inexperience, marine disasters, difficulty with the Indians, competition from the powerfully entrenched Hudson's Bay Company, spoilage of the finished product and markets indifferently receptive outside the limited Pacific trade, haunted them all. Though independent merchant-traders at Oregon City and elsewhere on the

Willamette and Columbia Rivers made successful shipments of salmon to Honolulu as early as 1840,¹⁸ the salmon industry was forced to wait a score of years before genuine headway was made. Not until American immigrants, lured for the most part by quite different enterprises had flocked in, and the Oregon boundary question had been settled in 1846; and only after the Hudson's Bay Company which some anathematized but all owed so much had retired to Fort Langley on the Fraser River--and not until after still more settlers had arrived, could free commercial enterprise obtain security and justify the establishment of regular maritime transport essential to export trade.

Thus, when Lieutenant Howison, commander of the United States naval establishment on the Pacific, investigated the Oregon territory in 1846 his report of the salmon industry was brief when he said:

Seven or eight hundred barrels are annually exported: They retail at Oahu for ten dollars a barrel, but I do not believe they are so highly appreciated anywhere as in Oregon, where they may be considered their staple article of food.¹⁹

Elsewhere Howison made a somewhat revealing statement, and both Wilkes and Dunn would appear to support him, when he said: "Strange to say, up to this day none but Indians have ever taken a salmon from the

18. H. H. Bancroft, History of Oregon, (New York, The Bancroft Company, n.d.), pp. 730-31. In 1840, Captain John H. Couch, commanding the brig Maryland of Newbury port, entered the Columbia River and put up a small quantity of salmon. In the spring of 1842 he returned with a new vessel, the Chenamus, named after the chief of the Chinooks. He established a salmon fishery on the Columbia and, at Oregon City, the first American trading-house in the Willamette valley.

19. Report, Oregon, 1848, 30th Cong., 1st Sess. H.R. Misc. Doc. No. 29, p. 28.

waters of the Columbia because they are wonderfully superstitious regarding this fish."²⁰ Surely the salmon packers would have shown little patience with Native superstitions had they possessed a market for more salmon than the irresponsible Indians could be depended upon to provide.

Not all the salmon packing of those days was confined to the Columbia. Sometime before 1852 a Mr. Charles J. W. Russell had established a trading-house at Shoalwater Bay, and in season barreled salmon for market.²¹ At Victoria, on Vancouver Island, in 1853 a sea captain, William Spring, formed a partnership with a cooper, Hugh McKay, for "curing and salting salmon for the Honolulu trade."²² Operations were conducted at Sooke and Beecher Bays. Governor Isaac I. Stevens in his report on the survey for a northern railroad records that in 1854 two partners, Riley and Swan, were on Puget Sound. "They put up 800 barrels in six weeks and were the first persons on the sound to use the seine in capturing salmon."²³ The seine was doubtless operated by Indian employees and it is notable that the date here given for the appearance of that gear on the sound (unless the word was used loosely)

20. Ibid., p. 27.

21. Swan, op. cit., p. 43.

22. E. W. Wright, editor, Lewis and Dryden's Marine History of the Pacific Northwest, (Portland, Lewis and Dryden Printing Co., 1895, p. 425.

23. Surveys and Explorations for a Pacific Railroad, 1853-5, op. cit., pp. 308, 310-11. The method of preparation is also described here. The section devoted to fishes appears under the signature of Dr. G. A. Suckley, U. S. A.

antedates by a quarter-century that assigned by investigators for the United States Fish Commission.

Governor Stevens' report also recounts that in 1853 and 1854 "large quantities" of salmon were salted for market near the mouth of the Columbia and at the Cascades 150 miles above.²⁵ Further along is provided a clue explaining a basic reason for the common failure of northwestern salmon salting ventures when it was stated:

Although the fish [when taken] were of the finest quality, second to none in the world, (I say this understandingly, having eaten excellent [Atlantic] salmon in Great Britain and the continent of Europe, as well as those brought to New York markets from Nova Scotia,) owing to the carelessness in packing, and the expense and difficulty that then attended the procurement of proper barrels and good salt, nearly all who went into the business lost money; and the salmon thus miserably preserved reached the markets of San Francisco and New York in such bad condition that they obtained a bad reputation among dealers.²⁶

The problem of securing barrels was probably not so difficult as obtaining an adequate supply of good salt. Noteworthy is the fact that the first barrel of pickled salmon sent to England (1824) evoked from the "Governor of the Committee" a letter to the "Chief Factors of the Columbia Department" which warns that, "altho' the Fish may be taken in the highest perfection, yet by a neglect in curing and packing it, it may, as was the case in the present instance, be unsaleable when

25. Ibid., p. 310.

26. Loc. cit. The parentheses here are brackets in the original; the brackets here were interpolated by the writer.

brought to this country."²⁷ In many cases the packers were forced to such extreme conservation of the precious salt that the salmon were put in the brine for only forty-eight hours before smoking.²⁸ As late as 1857 a United States government surveyor employed in the Oregon territory remarked all this and added:

The greatest difficulty attending these salmon fisheries has hitherto been in procuring salt sufficiently free from foreign substances; but this has, of late been obviated by the introduction of salt recently discovered in Southern California, which is said to be the purest article in the United States and can be sold much lower, on the Pacific Coast, than any other.²⁹

An essential which on occasion became so scarce (as at the mining camp at Jacksonville, Oregon in 1852) that an ounce of salt brought an ounce of gold³⁰ could scarcely be depended upon as a medium for preserving salmon which brought but ten or twelve dollars a barrel, re-tailed in Honolulu.

The industry still awaited better export facilities, more dependable methods of capturing the fish in quantities and, most of all, a cheaper or more dependable process for preserving the salmon.

27. Frederick Merck, editor, Fur Trade and Empire; George Simpson's Journal, 1824-1825, (Cambridge, Harvard University Press, 1931), p. 121. At that time the Hudson's Bay Company projected a trade in salmon with China but did not carry through because it was decided to attempt no direct fur trade at Canton.

28. Journal of Fort Langley, p. 145, as quoted by De Loach, op. cit., p. 9.

29. A. N. Armstrong, Oregon: Comprising a Brief History and Full Description . . . (Chicago, Charles Scott, 1857), p. 83.

30. Oregon Journal, Aug. 19, 1927.

CHAPTER V

THE SALMON INDUSTRY SINCE 1864

Salmon--warranted not to turn red
in the can.

Label of Jackson, Meyers & Co.

The gold rush to California in 1849 had cost Oregon the leadership of the American West. Until then the center of interest, population, and enterprise had been in the Willamette and Columbia River valleys. Though more than half its men were lured to the California gold fields in the initial rush, Oregon was again on the increase as to population and industry almost immediately. Farm produce brought fabulous prices in California. Lumber mills hummed along the Columbia and the profits induced expansion to Puget Sound where coal deposits also supplied the California demand. From sound and river ships sped southward deeply laden and then made the long, hard beat back against the nor'wester. Shortly after a decade had passed a railroad crept across the prairies. While men in high places talked of destiny, Americans, out of pain and bloodshed, in pioneering, conquest, and civil war, had swarmed westward and made it manifest. The score of years between the inking in of the forty-ninth parallel to the Pacific as the boundary between British and American soil and the end of the Civil War had brought an utter change in the economy of the Pacific coast.

In this new and expanding economy the salmon industry did not do well, still haunted as it was by the inadequacy of its preserving

methods and by markets unresponsive to a product either wholly strange or in bad repute. Salmon in the dried, pickled, salted or smoked preparations did not keep well in the absence of refrigeration and, moreover, in most cases suffered both in food value and in flavor. The industry had awaited not only a change in the regional economy but the revolution in methods of preserving which came with canning and freezing.

Canning as a means of preserving salmon waited more than half a century after the Frenchman, Nicholas Appert, had successfully preserved food in glass containers. The method was patented in England in 1810 and first successfully applied to marine foods in 1829 when Delaware oysters were packed in tins. When the process was first utilized on the Pacific coast is unknown but by 1860 California was exporting tinned fruits.¹

The new method, clumsy still, was applied to salmon for the first time in the United States on the Sacramento River in 1864.² Two years later the canning industry jumped to the Columbia where, by 1876, ten canneries were operating and producing a combined pack approaching half a million cases.³ Antedating the earliest American pack by one year, salmon were canned on the Fraser River in British Columbia in 1863,⁴

1. De Loach, op. cit., p. 11.

2. R. D. Hume, "The First Salmon Cannery", Pacific Fisherman, 1920 Yearbook, pp. 71-76.

3. Biennial Report of the Fish Commission of the State of Oregon, 1939, p. 21.

4. Henry Doyle, "History of the Pacific Coast Salmon Industry", Canadian Fisherman, Vol. VII, No. 6, (June, 1920), pp. 72-74.

but the Canadian industry was not definitely established until 1870.⁵ The year 1877 witnessed the first cannery operations on Puget Sound⁶ and saw the Columbia River industry seeking minor streams to exploit along the Oregon coast.⁷ In 1878, Alaskan salmon were first canned in the southeastern region but within ten years the industry had been pushed as far as the Aleutians and the sixteen canneries operating in 1888 in Alaska produced a combined pack approximating that of the coastal states. The following year found the number of Alaskan canneries more than doubled and the total pack exceeding 700,000 cases.⁸ Since 1888 the upward trend in the Alaska pack "has been in direct contrast to the downward trend on the Columbia River and the Oregon and Washington coastal streams."⁹ Whether or not Alaska was originally endowed with a greater number of salmon than were the coast states cannot be definitely known, but statistics would indicate that the canneries have been forced to move ever farther from civilization to maintain their raw material supply. The northward march of the canning industry was rapid.

Discovery of a method for freezing salmon, later followed by the quick-glazing process, likewise had great possibilities. Ice packing had long been practiced but it was adequate only for local trade.

5. F. W. Howay, British Columbia From Earliest Times to the Present, cited by Cobb, op. cit., p. 471.

6. Cobb, op. cit., p. 424.

7. W. H. Barker, "Reminiscences of the Salmon Industry", Pacific Fisherman, 1920 Yearbook, pp. 67-69.

8. Pacific Fisherman, Vol. XXXVI, No. 2, (1938), p. 75.

9. De Loach, op. cit., p. 42.

Though crude refrigerator cars had been used experimentally in 1868, not until twenty years later was the successful compressor type of ice machine developed. Two short years thereafter, in 1890, mechanical refrigeration was becoming common in warehouses and railroad cars.¹⁰ Before the turn of the century frozen salmon were being shipped to eastern markets. The trade was later extended across the Atlantic and in 1930 a writer was able to declare that there was scarcely a town in western Europe where frozen Pacific salmon could not be secured.¹¹

Today, choice troll-caught chinook salmon, taken from Prince Rupert southward are rushed over the transcontinental railroads and, it is said, sold by the week-end on the fresh markets of Montreal or Philadelphia. Though 86 per cent of the salmon catch is canned, 12 per cent mild cured, smoked, pickled and dry salted, and only 2 per cent is sold fresh or frozen,¹² this last trade is highly remunerative and of far more importance than its comparative volume would indicate. The true history of the salmon industry since 1864 lies, however, with the canneries.

SALMON CANNERIES IN CALIFORNIA

Perhaps the chief significance of the California salmon industry resides in the fact it provided the genesis of the modern cannery. In

10. Encyclopedia of the Social Sciences, Refrigeration.

11. Cobb, op. cit., p. 541.

12. United States Tariff Commission, Report to the Senate on Salmon and other Fish, Report No. 121, Second Series, (Washington, 1937), p. 83.

April, 1864, the firm of Hapgood, Hume and Company, consisting of Andrew S. Hapgood, and two Hume brothers in the partnership, with a third Hume, it would appear, as the sole employee, undertook the canning of salmon in a shed and scow at Washington, Yolo county on the Sacramento River. All the partners had been experienced in Atlantic fisheries and Mr. Hapgood had previously canned a few Atlantic salmon in New Brunswick.¹³

Despite the handicaps of crude equipment and home-shaped tins the pack for each of the first two seasons was 2,000 cases of salmon, all chinook. Years later one of the Humes wrote of the difficulties and discouragements of that first canning enterprise:

At least fifty per cent of the product spoiled at the cannery from the effect of defective work . . . all leaky tins were lost; and there were many also in addition to those so imperfectly made that they burst in cooking. To these troubles were added the difficulty of disposing of that part of the product that was good, the article being new to the merchants of San Francisco they would have nothing to do with it for a long time . . . the firm was very much discouraged and on the point of breaking up. Just at the darkest time, however, a merchant of San Francisco advanced shipping charges on the lot and found a market at good prices, which awakened new enthusiasm, and the business went ahead again.¹⁴

Thankful for their happy rescue, the partners were yet discouraged at the apparently dwindling runs of Chinook. Accordingly, at the close of the 1865 season, Mr. William Hume went scouting for a new location. Thereafter, until 1874 no salmon were canned on the Sacramento. In

13. R. D. Hume, "The First Salmon Cannery", *op. cit.*, p. 71.

14. R. D. Hume, Salmon of the Pacific Coast, (n.p., n.d.), p. 8.

that year, however, several canneries were opened and the peak was reached in 1883 when 200,000 cases were packed. The subsequent decline caused the last cannery on the Sacramento to close in 1919.¹⁵

THE SHIFT TO THE NORTHWEST

The location chosen by William Hume for the new cannery of Hapgood, Hume and Company, brought the new process back to the traditional salmon stream of the United States and also presaged the 2,500 mile leap northward in less than two decades which, in a few years more, saw the center of effort within the salmon canning industry established near its most remote axis. Likewise, most of the causes and effects which were to provide the subsequent pattern for the industry may be discerned in the early history of the Columbia River development. At Eagle Cliff, Washington, about forty miles above Astoria, the partners re-established their enterprise and during the winter preceding the season of 1866 prepared for canning and made two small gill nets 125 fathoms long and 32 meshes deep. Salmon were plentiful and the Company exactly doubled its previous yearly packs in the south.¹⁶ In 1867 the pack jumped to 18,000 cases and the year following to 28,000 cases.

15. De Loach, op. cit., p. 12. Sacramento salmon runs are said to have been depleted through the ravages of hydraulic mining, the introduction of bass, and over fishing.

16. These 4,000 cases appear regularly in the Oregon Fish Commission's cumulative statistics of the Columbia River salmon pack as the total for 1866. R. D. Hume in Salmon of the Pacific Coast, op. cit., p. 8, says, however, that the first 4,000 cases were packed in 1867. Victor, op. cit., p. 61, agrees with Mr. Hume.

Though the partnership had striven to keep its process a secret there was, apparently, little to be hidden for the season of 1867 brought competition. S. W. Aldrich, a former ship carpenter set up a canning establishment on a scow equipped with a cauldron, a brick furnace, and tools for cutting and soldering the cans. He did all the work from catching the fish to preparing them for market by himself.¹⁷ This jack-of-all-trades was not heard from again but other men better prepared entered the field and in 1876 seventeen canneries operated. The first cannery at Astoria was built in 1873 and thereafter the industry tended to draw nearer that town. By 1876 five canneries operated there.¹⁸ In the five years following 1876 the number of canneries in the Columbia River region had doubled and, it is said, more than half had been established by one or another of the Hume brothers of whom there were by then four on the river. The industry reached its peak in 1895 when the twenty-four canneries then operating packed 634,696 cases. Only during the intensive fishing of the war years did packs ever approach that total and not until 1928 were there again so many canneries. In the latter year, however, the pack was only slightly more than two-thirds of that of 1895. In 1937 the number of canneries had dwindled to eleven but the pack approximated that of 1928.¹⁹

17. Cobb, loc. cit., p. 430.

18. Alfred A. Cleveland, "Social and Economic History of Astoria", Oregon Historical Quarterly, Vol. IV, (1903), p. 140.

19. Biennial Report of the Oregon Fish Commission, op. cit., p. 21.

TABLE III

NUMBER OF CASES OF SALMON PACKED ON THE COLUMBIA FROM 1866 TO 1887,
TOGETHER WITH VALUE, PRICE PER CASE, PRICE PER FISH, ETC.

Year	No. of Cases	Value	Price paid to fishermen per fish, amt. in cents	Selling price per case	No. of boats	Cash paid to fishermen during seasons
1866	4,000	\$ 64,000	15	\$16.00	2	\$ 1,800
1867	18,000	288,000	20	13.00	15	10,800
1868	28,000	392,000	20	12.00	25	16,800
1869	100,000	1,350,000	20	10.00	35	60,000
1870	150,000	1,800,000	20	9.00	50	90,000
1871	200,000	2,100,000	20	9.50	75	120,000
1872	250,000	2,325,000	22 $\frac{1}{2}$	8.00	100	165,000
1873	250,000	2,250,000	25	7.00	125	187,000
1874	350,000	2,625,000	25	6.50	250	262,500
1875	375,000	2,250,000	25	5.60	300	281,250
1876	450,000	2,475,000	25	4.50	400	337,500
1877	460,000	2,490,000	25	5.20	450	345,000
1878	460,000	2,300,000	25	5.00	550	345,000
1879	480,000	2,640,000	50	4.60	750	720,000
1880	530,000	2,650,000	50	4.80	900	795,000
1881	550,000	2,475,000	60	5.00	1,200	990,000
1882	541,300	2,600,000	75	5.00	1,500	1,217,925
1883	629,400	3,147,000	75	5.00	1,700	1,416,150
1884	620,000	2,915,000	50	--	--	930,000
1885	553,800	2,500,000	75	--	--	1,301,050
1886	448,500	2,135,000	75	--	--	1,009,050
1887	356,000	2,124,000	90	--	--	961,200
Total	7,804,000	45,895,000				11,563,525

Source: Report of the United States Commission of Fish and Fisheries, 1888.

The first canned salmon exported directly to England were shipped from the Columbia River to Liverpool in 1871 when a Portland firm, Macleay, Macleay, and Corbitt, shipped 30,000 cases, or about one-sixth of that year's pack.²⁰ By 1880 most of the Columbia River product was sent to England,²¹ but the completion of the northern transcontinental railroads brought a change in the salmon market as pointed out by a contemporary news item:

Within the past few years there has been a notable change in the salmon market. Formerly the only demand was from Europe and our entire pack went to England and was distributed there. Since the completion of the railroads, however, a great market has been developed in the United States and more than half of the Columbia River pack goes east by rail.²²

In 1885, of the total pack of 553,800 cases, 100,508 were shipped to San Francisco, 227,037 to England, 39,175 to New York by sea, and 231,063 eastward by rail.²³ Following the development of a fresh and frozen salmon trade with the East and with Europe after 1890 the Columbia River cannery production suffered a decline not entirely attributable to over-fishing. In 1895 nearly seven million pounds of frozen salmon were shipped to Europe from the four cold storage plants then on the Columbia.²⁴

20. Cobb, *op. cit.*, p. 431.

21. George Brown Goode, *The Fisheries and Fishing Industries of the United States*, (Washington, 1887), Vol. I, Sec. V, p. 476.

22. *Oregonian*, Jan. 1, 1886.

23. *Loc. cit.*

24. *Report of the United States Fish Commission*, 1910, p. 537 and *Third and Fourth Annual Reports of the Oregon Fish and Game Protector*, 1895-1896, p. 62.

The salmon industry first employed the Chinese so long associated with canning when George W. Hume recruited a gang from Portland for the Eagle Cliff cannery in 1872. The Oriental labor did the work no better or quicker than the white but it proved more docile and the custom spread rapidly.²⁵

Development of the salmon industry attracted a large floating population to the lower Columbia region and in summer months of the earlier years two thousand migrant laborers and fishermen made Astoria a "rough place".²⁶ Most of these men who came and went with the seasons were immigrants from northern Europe and from China. Much of the immigration was, however, permanent. In April, 1877 a total of 2,628 immigrants arrived at Astoria and though about 1,700 proceeded inland the rest remained.²⁷ Of the 5,109 fishermen and cannery workers employed on the Columbia in 1888, only 996 were native born and 104 of those were Indians. A total of 1,396 were from China and 2,057 were from Finland and the Scandinavian countries. While 573 of the latter had been naturalized only thirteen Chinese had acquired that status.²⁸ In an Astoria city election about a dozen years later, of the 1,100 registered voters more than half were of foreign birth, and well over half of these were natives of the north European countries mentioned above.²⁹ This popula-

25. Cobb, op. cit., p. 430.

26. Cleveland, op. cit., p. 147.

27. Cleveland, op. cit., p. 142.

28. J. W. Collins, Report on the Fishery Industries of the Pacific Coast of the United States, Report of the Commissioner of Fish and Fisheries, 1888, 51st Cong., 1st Sess. H.R. Misc. Docs., Vol XLVII, p. 224.

29. Cleveland, op. cit., p. 148.

tion trend continued to be fostered wherever the salmon industry stopped in its northward movement.

When labor disputes began in the Columbia River salmon industry is not known, but following one of the strikes over the price of fish which usually preceded each season (and still do) the gill netters organized "The Columbia River Fisherman's Protective Union" at Astoria on April 1, 1886.³⁰ For men who sometimes slept in the gurry fouling the bilges of their boats they might appear exceedingly exclusive to some. Their constitution reads in part:

No liquor dealer, gambler, politician, capitalist, lawyer, agent of or for capitalists, nor persons holding office, . . . shall under any consideration become members of this organization, . . . No stockholder or shareholder of any cannery is eligible to membership in this union.³¹

The organization was also decidedly antagonistic to fish traps and fish wheels. One of the most prolonged and bitter strikes occurred in the spring of 1896 when, for seventy-two days of the short season, no salmon were packed. An excuse was at that time provided for the first of the two instances in which Oregon state military have been ordered to take part in a major labor dispute. After the militia was six days on the scene the union and the packers' association "compromised" on the original price offered by the packers and more than a thousand gill-net boats finally sailed.³² The union was not broken, however, and is still

30. Collins, ibid., p. 204.

31. Collins, op. cit., p. 205.

32. Third and Fourth Annual Reports of the Fish and Game Protector of the State of Oregon, 1895-1896, pp. 25-26. Labor-packer disputes have been, and remain, no inconsiderable factor in the conservation of salmon.

in existence.

Besides providing the pattern of organization, marketing, population and labor which was to remain more or less typical, the Columbia River salmon canning industry likewise saw the development of most of the basic canning machinery and the growth of the related industries. Most of the important inventions are attributable to Mathias Jensen, a Dane who fished on the river for many years. From a successful net-knitting contrivance he turned to the can filling machine in common use today and thence to the first efficient topping machine. Patents for the two latter were sold to the Alaska Packers Association and, no doubt, contributed considerably to the growth of that organization.³³ Such contrivances, and especially the famous "Iron Chink" first used in 1903, removed the bottle necks from the industry and provided scope for mass production.³⁴

Earliest of the allied industries was that involved in can making. In the beginning each cannery made its own by hand or with crude mechanical methods, but a successful can-making machine was invented, by Jensen it is said, and was in general use in independent plants by 1895. In early days gurry scows hauled all fish offal into the current and dumped it, but by 1883 a factory for extracting oil and making fertilizer

33. Barker, op. cit., p. 68.

34. The "Iron Chink" beheads, splits and cleans the salmon and may be adjusted to all species except chinook. The name is derived from the fact that each unit replaced approximately twelve to twenty Chinese laborers.

from the refuse was in operation in Astoria.³⁵

The salmon industry had not, of course, long been confined to the Columbia. As early as 1876, R. D. Hume had feared that the river was being fished out and accordingly he established the first cannery on a minor stream, the Rogue River, and made his first pack there in 1877.³⁶ With him was a young man from Liverpool who had left a ship five years earlier at Astoria and had since been employed in various canneries. This former sailor, W. H. Barker, was to be influential in the salmon industry for more than forty years and one of the chief movers in combinations among packers in both the United States and Canada.

The year 1877 likewise marked the introduction of canning to Puget Sound which had hitherto been the refuge of finally successful salmon salteries. At that date Jackson, Myers, and Company who had been among the pioneers on the Columbia transferred operations to Mukilteo, Snohomish county and packed 5,000 cases of silver or coho salmon--the first instance in which other than chinook were canned.³⁷ Later this plant also canned the first humpbacks and the firm has been credited with having issued the famous labels, "Warranted not to turn red in the can," in an effort to divert the consumer's prejudice from the light-colored flesh of that species.

The earliest Puget Sound sockeye cannery was built near Blaine, Washington about 1891 and it was this plant which the following year

35. Goode, op. cit., p. 750.

36. Barker, op. cit., p. 67.

37. Cobb, op. cit., p. 424.

demonstrated the tremendous significance of fish traps for the industry. During the early years canned sockeyes were handicapped on the market by a suspicious public conditioned on chinook but because sockeyes also retained their red color they were successfully marketed when labeled "Alaska Reds" or "Columbia River Salmon".³⁸

It would appear that the first cannery on the outer coast of Washington was established at Aberdeen in 1878 by B. A. Seaborg, who had also operated on the Columbia River.³⁹ That part of the Puget Sound region within the United States first produced a pack exceeding that of the Columbia River peak season in 1899.⁴⁰ This was done with but two-thirds the number of canneries.⁴¹ Two years earlier, however, the forty-three canneries operating in the Canadian share of the region and where the chief spawning grounds lay, made the first pack in any region exceeding a million cases.⁴² The number of American canneries on Puget Sound grew steadily until 1915 when forty-one were in operation. Despite the war time boom which brought even more into the field, the intensive fishing of that period and the blocking of the Fraser river in 1913 has caused a general decline since that time.

CANNERIES IN BRITISH COLUMBIA

The same restless movement which stirred the population of the

38. Loc. cit.

39. Ibid., p. 427.

40. Ibid., p. 553.

41. Rounsefell and Kelez, op. cit., p. 703.

42. Pacific Fisherman, 1940 yearbook, comparison of tables, pp. 57-

United States to migrate to the Pacific around the middle of the century had its counterpart amongst Canadians. While they saw in their West only a private preserve of Gentlemen Adventurers their gold rushes waited and they pushed more slowly across the plains. Though the Hudson's Bay Company was not so utterly monopolistic as many of the more restless settlers of the lower Fraser and Vancouver Island bitterly maintained, a British Parliamentary investigation resulted in the revocation of the Company's charter in 1858 and the establishment of Crown Colonies. The monopoly had fallen and private enterprise arrived.

Among the first to take advantage of the change was a Mr. Annandale. At New Westminster on the Fraser River in 1863 he canned the first Pacific salmon.⁴³ Convinced of the profitableness of the venture he visited Scotland the following winter and persuaded Mr. Alexander Ewen, a man familiar with the Atlantic salmon fishery, to join him. From the season of 1864 to his death in 1907 Mr. Ewen was a leader of the British Columbia canning industry. Until 1870, however, the original canning business appears to have been operated merely as an adjunct to a salmon saltery. In that year, though still continuing with the salting process at the old establishment, Mr. Ewen, Alexander Loggie, James Wise, and David S. Hennessy built a plant devoted exclusively to canning at Anniesville about three miles below New Westminster. At the same time, Captain Stamp, provided competition with another cannery erected at Sapperton. By 1873 the Lane, Pike and Nelson Company had also established a cannery

43. Doyle, op. cit., p. 72.

on the Fraser. The combined pack in that year totaled 9,847 cases of sockeyes. Thereafter the industry grew steadily in the number of canneries, and in production. In the same year which first saw canneries on the Oregon coast and in Puget Sound the Canadian industry leaped to the Skeena River in northern British Columbia. As in the coastal states the Canadian industry grew fastest after about 1883. That year, it may be remarked, witnessed the operation of "Spratt's Ark", the first floating cannery which, however, lasted but two seasons.⁴⁴

The early pinnacle year in Canadian production came in 1901 when the seventy-eight canneries then running packed a total of 1,247,212 cases or one-fourth of the world's canned salmon produced in that year.

British Columbia fisheries are not controlled by the provincial government. All Canadian fisheries control is vested in the Dominion Fisheries Act as amended in 1935. Under its authority special regulations for the British Columbia salmon fisheries have been invoked since 1899 in strict detail for the various areas. The provincial government does, however, exercise indirect control through its authority over all canning operations.⁴⁵ Until 1924 the use of motor-powered fishing boats was forbidden in all the northern salmon fisheries of British Columbia.⁴⁶

43. Cobb, op. cit., p. 472.

44. Gregory and Barnes, op. cit., pp. 70-71.

45. Cobb, op. cit., p. 476.

Not until 1913 did the Canadian salmon industry surpass its previous peak of the year 1901 but even before the latter date it had lost to Alaska in 1899 the leadership which it had taken from the coastal states in 1897. At the turn of the century the Alaskan industry canned more salmon than any other and within a decade it generally produced more than half of the world total.

THE SALMON INDUSTRY OF ALASKA

It is not known when or how the idea of purchasing Alaska originated but the possibilities of exploiting the abundance of fish in Alaskan waters fortified Secretary Seward, one of the few remaining ardent expansionists, when he advocated and defended the purchase. Moreover, the question of American fishing rights in Alaskan waters provided him with an approach to Baron de Stoeckl, the Russian ambassador.

Since the Russian-American convention of 1824 had expired by limitation ten years later, citizens of the United States had enjoyed no privileges in Alaskan territory,⁴⁷ but before 1867 American fishermen were resorting there to salt salmon and other fish and American whalers were already depleting the whales which frequented the Gulf of Alaska and the Bering Sea. During the winter of 1859-60, Mr. J. L. McDonald of the Washington Territory ineffectively petitioned the Russian governor of Alaska who was visiting in San Francisco, for legal rights in the prose-

47. Victor J. Farrar, The Purchase of Alaska, (Washington, W. F. Roberts, 1935), p. 10.

cution of Alaskan fisheries. Sixteen years later Mr. McDonald was still trying (was was a San Francisco company), and in January, 1866, he easily induced the Washington Territorial Legislature to memorialize President Johnson for a fishing treaty with Russia. It was to letters from him that Secretary Seward replied in April, 1867 and said, in part: "In consummating the recent purchase, I was strongly fortified by the letters you wrote to me touching the valuable fisheries in those waters."⁴⁸

For two years following the purchase the United States government remained content with no other efforts in Alaska than those involved in the ceremony of acceptance. Thereafter, for several decades it is difficult to judge whether the scant attention periodically made or the general inattention was worse. The year 1878 which saw the North Pacific Trading and Packing Company at Klawak and the Cutting Packing Company at old Sitka in their second canning season, also witnessed the spectacle of citizens at new Sitka, alarmed over exposure to Indian attack, having their appeal for assistance first answered by a British warship.

As elsewhere the Alaska canneries were preceded by salteries. Indeed, both of the canneries of 1878 appear to have occupied the premises of older salting establishments. Apparently, however, the Russians had never salted salmon for export trade, though Bancroft mentions that several barrels of king or chinook salmon were shipped each year to

48. J. L. McDonald, Hidden Treasures, or Fisheries Around the North-West Coast, (Gloucester, Mass., Proctor Brothers, 1871), pp. 10-12.

St. Petersburg as presents for friends of the Russian-American Company.⁴⁹
 Ivan Petroff, special agent for the United States census writing in 1882
 implies as much but adds:

The once famous redoute or deep-lake salmon-fishery
 on Baranof island, which at one time during the Russian
 rule supplied this whole region, and whence 2,000 barrels
 were shipped in 1868, now lies idle.⁵⁰

He remarks that the Klawok cannery "had in its employ during the season
 as many as 160 Indians and 20 whites" who packed between 7,000 and 8,000
 cases. This cannery is one of the few which has been in continuous
 operation since its inception and today its employees are still pre-
 dominantly Native.

Petroff reveals that there were two fishing establishments on the
 Karluk River, Kadiak Island, in 1880 which packed from 1,600 to 2,000
 barrels of salt-salmon between them. "Several hundred of these barrels
 were filled with bellies only, a process that required the killing of
 37,500 fish in order to fill 125 barrels."⁵¹ The next year one of these
 firms shipped both canned and salted salmon to San Francisco.

In 1882 there were three canneries operating in Alaska, one at
 Klawok, one on the Karluk River, and one on Cook Inlet which had
 bought the equipment unused after the first two seasons at the Sitka
 cannery. Thereafter the number mounted slowly and steadily to a total

49. History of Alaska, (San Francisco, The History Co., 1886), p.
 661.

50. Department of the Interior, Census Office, Report on the Popu-
 lation, Industries, and Resources of Alaska, (Washington, 1884), p. 70.

51. Ibid., p. 71.

of sixteen in 1888 but the following year the number had jumped to thirty-seven, two-thirds of the increase being in the central district. In that seven-year period the Alaska salmon pack had increased more than thirty fold and, in fact, had nearly doubled between the end of the 1888 and 1889 seasons. By 1892 the Alaska streams furnished the larger portion of the United States salmon pack while a few years earlier the remoteness of the region and a tendency to underrate the Alaska product on the market had, despite the known abundance of fish, tended to discourage operations there. At the end of the eighties, however, improvement in rail and water transport, with an apparent decline in Columbia River salmon runs, had increasingly turned the eyes of the packers to Alaska.

In the midst of this developing situation came news of a phenomenal pack. The Alaska Commercial Company had established a cannery on the Karluk River in 1887 and in the first season made a pack, unusual under existing conditions, of 13,000 cases. Enlarging its facilities for the following season the unprecedented number of 101,000 cases was canned by this single establishment. In obtaining the million or more sock-eyes required the river was simply blocked and the milling, thwarted
52
fish taken as needed. The news of such an immense pack swept along the coast and brought two results, a literal stampede of canneries to

52. The Karluk River is but sixteen miles long; its sources, however, are in two large lakes. Petroff reported that the runs of fish there were "so great as to interfere seriously with the movement of canoes."

Alaska and the attention of Congress.⁵³ The effect of the latter brought the first legislation for protection of Alaska fisheries in the act of March 2, 1889.⁵⁴

This act, though it prohibited the obstruction of salmon streams and authorized the Secretary of the Treasury to establish "regulations and surveillance", prescribed no machinery nor provided any money for carrying it into effect. The restraint was negligible and the law was probably violated without scruple as is often the case in Alaska today where the chance of discovery is slight.

The great number of canneries, exceeding a hundred for the entire coast shortly after 1890, and with one-third of them exploiting the enormous Alaskan runs, also had its effect. Technological improvements at the same time were boosting the daily packs of individual canneries from a few hundred cases to three or four thousand and with declining production costs. Ever larger quantities of canned salmon flooded the market. Competition between companies and between fishermen was bitter, often bloody, and small operators were forced to sell their product or their plant at distress prices. Over-expansion, leading to bankruptcy and operating against a background of general disorder became a periodic manifestation of the industry. The Alaska Packers' Association, incor-

53. Bulletin of the United States Fish Commission, Vol. XII, (1892), 53rd Cong., 2nd Sess. H.R. Misc. Doc. No. 122, pp. 2-3.

54. Ibid., p. 2. The Bulletin of the U. S. Bureau of Fisheries, Vol. XLIV, (1928), pp. 47-52, contains an annotated list of all federal fishery laws and regulations affecting Alaska salmon and concludes that until 1922 the catch had never been "affected materially by legal restrictions."

porated at San Francisco in 1893 provided one remedy. For a time it canned half the Alaska output or roughly a quarter of the world production of canned salmon and became so powerful, it is said, that the market prices were established by its opening quotations.

To about 1900 the center of Alaska salmon production was around Kadiak and Chignik in southwestern Alaska. After 1898 the sockeye runs in that region suffered a decline which caused a shift in focus to the southeastern district which, for the last quarter century, the greatest contribution to the total pack has been made.⁵⁵ The western area, virtually composed of the Bristol Bay salmon fisheries and limited almost entirely to sockeyes, the species most popular for canning in earlier years, attained its maximum pack earlier than the other two districts. After the exhaustive fishing during the World War the area showed a sharp decline in one of its cycles but a careful rehabilitation program was instituted more than a decade ago.

With the declining runs of the more desirable species shortly after the turn of the century and the shift of the Alaska industry to the southeastern region where humpbacks or pinks were abundant, the pack of that cheaper species exceeded those of any of the other grades in 1907. After 1914 great quantities of chum or dog salmon were also canned but this pack has declined since 1926.

At the present time the total Alaskan production appears to be holding up very well. With the principle of fifty per cent escapement

55. Figures from Pacific Fisherman yearbooks which include cumulative statistics of salmon catches, canneries, etc., in the various areas.

embodied in the White Act of 1924,⁵⁶ and the Bureau of Fisheries having since held complete administrative authority to protect Alaska salmon there is hope that the present level will be sustained. The average of the annual packs for the decade preceding 1939 is greater than that for any earlier decade. The average number of canneries in operation during the past decade is somewhat less than that for the two preceding. Various factors enter into an explanation of this apparently sustained or even increasing yield. Among them is the charge by some independent fishermen that the wide discretionary powers granted the Alaska Fish Commission have been subjected to those abuses familiar in instances where a government bureau controls a raw material in demand by capital. The best information suggests, however, that the Bureau of Fisheries' avowed policy of permitting the maximum catch consistent with maintenance of the runs is simply vindicating itself.

56. Act for the Protection and Regulation of the Fisheries of Alaska, June 6, 1924, 43 U. S. Stat. at L., pp. 464-67, and 52 Stat. at L., p. 1174. See also Laws and Regulations for Protection of Fisheries of Alaska, op. cit.

CHAPTER VI

COMBINATIONS AMONG SALMON CANNERS

--there is no magic formula
for packing and selling
canned salmon.

Pacific American Fisheries advertisement.

Overdevelopment was nearly as characteristic of certain periods in the history of the salmon industry as was the canned product. Soon after the first Columbia River cannery was established speculative capital rushed into this venture that yet required years of experimentation and which, in scope, has never been equaled by other fisheries.

Wreckage of the operating companies littered the bankruptcy courts during the whole period from the early eighties into the nineteen-twenties. Likewise, for every producing cannery along the rivers and inlets of the northwest coast, there has usually been another, abandoned, moss-grown, dismantled by Indians, or perhaps revealing its former existence only in a patch of rank fire weed.

Gregory and Barnes,¹ in their study of the fisheries of the North Pacific, discovered by actual count that during the period from 1880 to 1920, of the 126 canneries reported built in southeastern Alaska,

1. The present chapter is largely a summary of pp. 89-102 in the work by those authors which has previously been cited, and also of various sections in the study made by De Loach. These two works, with that of Cobb, all cited frequently here, have been invaluable in the preparation of this paper.

twenty-nine were subsequently abandoned or destroyed, thirty-three were sold, eleven passed through bankruptcy, and six combinations or mergers were effected.

In central Alaska, where the earliest far-northern developments came in force, the mortality was even higher; twenty-three of the fifty-five canneries reported built having been dismantled or destroyed, thirteen sold, with three ending in bankruptcy, while two combinations were reported.

Nor was the Alaska industry unique in this respect; for of the 132 canneries reported built in British Columbia prior to 1920, more than sixty were sold, dismantled or destroyed and several associations and mergers effected. On Puget Sound the industry evinced similar symptoms. Gregory and Barnes, citing Cobb, reported that of the approximately seventy canneries built in that region during the period, forty-six were destroyed or sold while five bankruptcies were recorded. Only the Columbia River presented a picture less dismal; partly because that area, in 1887, provided the industry with the first successful landmark in the combination of producing companies.

The general movement toward combinations in the salmon industry was urged by those same periodic depressions during the last two decades of the nineteenth century that tended to drive individual operators of most industries either out of business or into protective associations. Few others, however, were so obtrusively haunted along the whole gamut of uncontrolled raw-material supply, over-expansion,

and declining prices as was the salmon industry. Accordingly, since others better buttressed at the base and more strongly fortified at the top, sought relief in combinations and mergers, it was only natural that the salmon packers should do the same, and that combinations among them should parallel the general trust movement in the United States.

In 1885, on the Columbia River, the tendency first became evident in the salmon industry. At that time--perhaps shortly before--a combination known as the Eureka and Epicure Packing Company was formed from three north-shore canneries. The organization failed, however, in the immediate prevention of financial difficulties and the firm of George and Barker was persuaded to join and take charge.² This Barker was the same who had gone with R. D. Hume to the Rogue River in 1877 and down to the time of his death, about 1930, his name is perhaps most frequently mentioned in the history of the American and Canadian salmon industry. With Mr. Barker as superintendent the Eureka and Epicure Packing Company was joined by six additional plants to form the Columbia River Packers Association in 1887. It remains the dominant concern in that region today. Mr. Barker's superintendency was short, however, for he was among those joining in the rush to the sockeye or red salmon region of Alaska following the news of the immense pack on the Karluk River in 1888.

The mushrooming of canneries in that region not only caused the Alaskan pack of salmon to increase more than three fold in as many

2. Cobb, op. cit., p. 455.

years, but also approximately doubled the world production at a time when the market was already flooded and prices had slumped. As early as the 1888 pack three of the larger Alaska operators were forced to guarantee the accounts of smaller concerns in an effort toward market stabilization.³ In 1890 the three canneries operating at Chignik in the red salmon district joined in a plan to operate a single plant but share in the costs and profits. The arrangement continued during the following season and "its evident success in 1890 probably led to the local association on Kodiak Island in 1891, and then to the association which now exists."⁴ Thus, at the end of the 1891 season the first Alaska Packers Association was formed to dispose of the unsold product of that year, a total of 363,000 cases. This was successfully accomplished and the Association expired.

The success of the early arrangements led, in January of the following year to the incorporation of a profit sharing organization, this time called the Alaska Packing Association, which included thirty-one of the thirty-seven Alaskan canneries. The Association operated but nine of their plants, the pack was reduced by half, and members shared in the pool in proportion to their respective packs of 1891.

The year 1893 saw two withdrawals from the Association which was then reorganized and incorporated at San Francisco on February 9 of that

3. Barker, *op. cit.*, p. 69.

4. Jefferson F. Moser, "The Salmon and Salmon Fisheries of Alaska", *Bulletin of the U. S. Fish Commission*, 1898, Vol. XVIII, pp. 18-21, cited by Cobb, p. 455.

year--this time reverting to the name Alaska Packers Association which it retains to the present. The plants of the members, valued at \$1,033,850 were exchanged for capital stock in the corporation, and though additional shares were sold to members, none were offered to the public. From its first season the Association was a success. During the first decade the yearly average net profit was \$509.26 per each thousand cases packed; by 1919 it had doubled that.⁵ After 1900 the Alaska Packers Association acquired plants on Puget Sound and closed all but one.

British Columbia had suffered from the same troubles that bedeviled the other salmon producing regions. Accordingly, in 1901, the Canadian canners adopted the successful American preventative and styled it the British Columbia Packers Association. When the anticipated relief was not immediately forthcoming, Mr. Barker, who continued his position on the board of directors of the Columbia River Packers Association, was called as general manager in 1904 and was subsequently and continuously elected president.⁶ In the year of organization the Association controlled forty-one of the seventy-eight canneries in the province.

Successful consolidation came latest to Puget Sound. There, in 1902, the Pacific Packing and Navigation Company, incorporated under the laws of New Jersey, organized sixteen canneries of that region and Alaska. Its career ended in bankruptcy court the following year and

5. Gregory and Barnes, op. cit., p. 96.

6. Barker, op. cit., p. 69.

many of its interests were taken over by the Northwest Fisheries Company, a subsidiary of the Booth Fisheries Company of Chicago. A similar attempt made about the same time under the name of Pacific American Fisheries was likewise organized under New Jersey laws and, though that charter was revoked in 1905 for non-payment of taxes it has continued in business. In these years the firm of Libby, McNeill and Libby was also busy acquiring canneries. The two concerns last mentioned, together with the Alaska Packers Association and the comparatively recent Alaska Pacific Salmon Company are today the big four of the industry.

Until 1920, however, the Alaska Packers Association, operating also on Puget Sound, the Columbia River Packers Association, with plants in Alaska as well, and the British Columbia Packers Association, operating exclusively within the Province, were the outstanding combinations. The two latter suffered in relative importance for their respective areas in the immediate post-war period but have since regained ground, each recently accounting for approximately forty per cent of the pack in its own region. The fortune of the Alaska Packers Association has been somewhat different. Dominating, as it did, the red salmon area when that region produced the bulk of the Alaskan pack, the Association then shared the gains. But when that area declined and the Alaska industry shifted to the southeastern district, increasing the total pack with cheaper grades, the Alaska Packers Association continued to concentrate on the western area and, though still dominant in that region, it accounts for but ten per cent of the present Alaska pack.

It should be apparent from the foregoing that while the share of combinations in the total packs up through the World War was large, they did not, except in the first seventeen years of operations by the Alaska Packers Association, constitute a close monopoly even of a particular region. The industry continued to expand, sometimes faster than the combinations.

Following the World War the salmon canning industry exhibited renewed tendencies toward combines or mergers. Demoralized as it was by the surplus left on its hands with the cancellation of government contracts in 1919, it yet had to face the depression of 1921. Not until 1924 did it recover and by that time many of the weaker members had been either forced from the field or into the hands of the stronger. Following recovery the primary motives behind the new mergers were, quoting Gregory and Barnes, three-fold:

- (a) Anticipated economies of production in consolidating plants, traps and marketing arrangements,
- (b) increased profits to be made in larger packs of cheaper brands of fish, and (c) financing profits--a common phenomenon of the time.

At this same period, Federal regulations in the interest of conservation of Alaskan salmon fisheries was strengthened, as has been mentioned, by the White Act of 1924. The results of scientific investigations were then applied, the waters and shores were more adequately policed to hold destructive gear and wasteful processing in check, and attempts were made to rebuild depleted runs to a condition of sustained yield. Within this framework the salmon industry was presented with a more favorable

opportunity for further assuming the mature and balanced economic stature of which some of its tendencies were an outgrowth.

Specific Federal regulations in Alaska sometimes worked to the benefit of larger concerns and thereby encouraged the renewed trend toward consolidation. When, in the case of the fish traps, the Bureau of Fisheries decreed greater spacing, both the larger and the small operators were affected; but the larger companies through trades of trap sites and the abandonment of scattered canneries were able to concentrate both their raw material supply and their canning operations. Technical improvements likewise worked more to the advantage of firms with the greater capital and, moreover, in some measure thwarted regulations designed to lessen fishing intensity. Before this time gasoline motors had developed sufficient dependability for the sole power of boats, and at this date the more expensive but cheaper-operating Diesel was growing in favor. Either form now encouraged the construction of larger and faster boats, not only for mobile gear units, but also for tenders which might haul fish from productive traps located in areas thirty to a hundred miles from the cannery and previously inaccessible. Fewer canneries were enabled to pack more salmon.

While operators saw, as the chief advantage in combination, the avoidance of the hazards of "spotty" fish runs through judicious disposition of member canneries over a wide area, they did not overlook the possibility of greater market support from a more adequate financial base. Likewise, the attendant possibilities of weightier bargaining

power with labor and fishermen, an enhanced position with respect to steamship lines, and the advantages to be derived through collective pressure on Federal agencies was also apparent to the canners.

The post-war boom, coupled with better processing techniques and a growing demand for the cheaper and more abundant grades, further stimulated combinations along horizontal lines while, at the same time, financial integration and the trends in marketing⁷ effected a closer relationship in that direction.

Since 1924 practically all of the major companies operating in the salmon business have been reorganized, the Alaska Packers Association being the chief exception. The Columbia River Association was reorganized in that year and the Pacific American Fisheries, Inc. was the result of a reorganization of 1928. The latter had been buying canneries for several years and by 1934 it was the largest packer of canned salmon in the world. Since then it has leased nine canneries from the Booth Salmon Fisheries with option to purchase.⁸ In 1939, however, it was reported in financial straits.⁹ Outstanding among new combinations of the post-war era was the Alaska Pacific Salmon Company of 1928 which secured control of eleven canneries through a reorganization scheme in 1934.¹⁰ In the Canadian share of the industry, the British Columbia

7. De Loach, op. cit., treats the history of marketing in the salmon industry in systematic and comprehensive fashion, but his treatise is beyond the scope of this paper.

8. De Loach, op. cit., pp. 50-51.

9. Gregory and Barnes, op. cit., p. 102.

10. De Loach, op. cit., p. 50.

Packers, Ltd. was also reorganized in 1928 to include additional canneries,¹¹ but it was reported in the hands of creditors in 1939.¹²

The experience of these combinations shows, as Gregory and Barnes have pointed out, that size not only has advantages but also its drawbacks, most apparent from a financial viewpoint:

A large investment in specialized equipment, kept idle for much of the year and in dull seasons, involves heavy overhead costs. In bad times the small firm has profited from the fact that much of its equipment is furnished by public service companies, can companies, etc., who supply rental equipment. Then, again, in years of falling prices the holders of large inventories--who often have bought up the weakly held stocks of small operators to keep them off the market--suffer grievously from inventory losses.¹³

And here some effort should be made to bring the results of combination into proper focus with the balance of the salmon industry. Wholly adequate figures are not available but the following are somewhat indicative:¹⁴

Firm name	No.	
	Canneries	Investment
Alaska Pacific Salmon Company	11	\$3,696,581
Alaska Packers Association	9	6,216,104
British Columbia Packers, Ltd.	39	6,958,226
Columbia River Packers Ass'n	6	3,607,676
Pacific American Fisheries, Inc.	18	4,194,157
Total	83	\$24,672,744

These figures are for 1933 and 1934. In 1937 the total number of canneries in operation for the whole northwest was 177, which is probably not substantially different from that of 1934. The total value of the

11. Loc. cit.

12. Gregory and Barnes, op. cit., p. 102.

13. Loc. cit.

14. De Loach, op. cit., p. 53.

salmon pack of the coastal states and Alaska in 1937 was \$55.6 millions. British Columbia plants added \$12.0 millions, making a grand total of \$67.6 millions for the salmon canning industry.¹⁵

From the above figures no relationship is to be construed except that, though the canneries or combines are ordinarily greatest producers, such combines do not monopolize the means of production. Incidentally, the industry is revealed as a relatively small one in the American scale. It is, however, outstanding amongst American fisheries.

15. Gregory and Barnes, op. cit., p. 103.

CHAPTER VII

LABOR OF THE SALMON INDUSTRY

Laud to the Lord, who gives to this, to that denies his wishes,
And dooms one toil and catch the prey, another eat the fishes.

Sir Richard Burton, Arabian Nights¹

In years following the organization of the Alaska Packers Association at San Francisco in 1893, the annual departure and arrival of the company's sailing fleet was an occasion of great interest in the Bay.¹ Families, whether from the mansions around Nob Hill, or from the humbler homes south of Market Street and in China Town, watched the old square-riggers stand in or out the Golden Gate, not because of any wistful realization that they witnessed a maritime era in sunset, but because those ships bore relatives and friends to or from the north. For, in addition to the salt, tinsplate, box shocks, and all the other materials necessary for canning at a remote plant, the men to do the work were crowded aboard when the ship broke moorings in the spring. The lowliest Chinese gutters and slimers, the most reckless fishermen, the ablest mechanics and the most experienced superintendents or managers were in

1. The last fleet of American square-riggers eked out an existence in the salmon industry, the Alaska Packers Association alone having dispatched to their northern plants an average of thirty such vessels annually from 1894 to 1926. Nine were displaced by a single steamer in 1927 and in 1928 only eleven sailed--most of them for the last time. They survived long as they did only because they were laid down as the shipbuilder's final attempt to answer the challenge of the tramp steamer. Aptly described by a sailor as "built by the mile, cut in lengths, and joined at both ends", everything was sacrificed for carrying capacity; and so, they served the canneries as floating warehouses and cheap transport north and south. See Walter Macarthur, Last Days of Sail on the West Coast, (San Francisco, 1929), p. 45 ff.

the complement. Men representing a complex picture of racial types, cultural backgrounds, technical skills and standards of living joined in the annual northward trek which has remained an outstanding feature of the labor structure on the Pacific coast.

Wherever the necessity of importing a great number of workers for the canneries has existed, additional responsibilities have fallen upon the packers. In the case of much of its shore labor the industry has, until quite recently, often been remiss in its obligations. The responsibility for hiring, feeding, and paying the Oriental workers especially has been shifted to labor contractors, with the result that abuses inherent in such a system have been common.

In general, the labor structure of the Alaskan salmon industry has been somewhat analogous to that which existed in the coastal states before the local population was sufficient to supply the thousands of seasonal workers required. In Alaska today the canneries find a concentration of local population only in the southeastern region and even that is insufficient to fulfill the needs of the industry. Thus, despite the recent depression-born wave of unionization which in Alaska has joined forces with the "Alaska for Alaskans" movement in an insistence that local labor be hired when available, the industry must still import approximately seventy-five per cent of its labor for the brief Alaskan season.²

2. Bower, op. cit., 1937, pp. 107, 112-19.

The labor which has been employed by the Alaska industry has been divided into two general groups by the line which separates land from water.

Ashore, beside the Oriental, Mexican and Native workers who have done the routine tasks in the canneries and who have constituted the largest single employee group, have also been found the skilled technicians necessary to keep the machinery functioning far from repair shops. These men, with the carpenters, have usually received higher wages than those paid in the states for similar work. Many of them have been employed the year around by the can and canning machinery companies from which the packers have rented or bought their machines. In addition to such maintenance men, other shore workers--radio operators, foremen, superintendents and, especially, the bookkeepers have generally had year-round employment at the company's home offices in Seattle or San Francisco.

Operating on the water have been the fishermen and those engaged in transporting the catches from either mobile or fixed gear units to the canneries. The total in these employments during the 1937 season was approximately 12,000.³ This group has always been composed, in the Alaska industry, of whites or Natives, with the latter constituting a very substantial part of the total. The fishermen themselves have been divided into two groups irrespective of race, with employee fishermen supplying the canneries with about seventy per cent of the fish

3. Loc. cit.

while the independent fishermen supplied the balance.⁴ An employee fisherman was defined in the proposed National Recovery Administration Code for the Canned Salmon Industry as "any person over whom the industry exercises control by reason of the fact that the member of the industry has loaned, leased, chartered (or by way of subterfuge given or sold) any gear and / or boats for the purpose of fishing for such a member."⁵

Most striking among employee fishermen are those who have been employed in the gill-net fishery of Bristol Bay where all catches have been made with company-owned gear. Of all salmon fishermen they have commanded the highest remuneration. Though Alaskans from other districts have been increasingly employed, the greater number have always come from "outside". Since 1902 when the Alaska Fishermen's Union was organized, the men fishing in this area have composed the backbone of that organization. The local population of the region has remained negligible and though the imported fishermen from either outside or elsewhere in Alaska have been utterly dependent upon company-owned gear, yet their complete indepen-

4. John R. Arnold, Earnings of Fishermen and of Fishing Craft, Appendix to the Fishery Industry and the Fishery Codes, Office of National Recovery Administration, Division of Review, Work Materials No. 31 (appendix) Industries Studies Section, (Washington, 1936), p. 124. It would appear from this study that there was no difference in fishing efficiency between those using company-owned or privately-owned gear.

5. National Recovery Administration, Codes of Fair Competition, Vol. X, (Washington, 1935), p. 167.

dence of any investment in gear of their own, the absence of competing local labor, and the short operating season imposed by Bering Sea conditions and Federal regulations have granted these men a bargaining power which is perhaps the greatest enjoyed by any workers in the salmon industry. The area abounds in the valuable sockeyes for which the packers have been quite willing to pay a premium, and the regulation requiring the use of sailing boats encourages employment of the most skillful fishermen.

Harking back to the days of the square-riggers when the gill netters were expected to work ship during the long passage north or south and perform longshore service at the cannery, the Bristol Bay fishermen still receive the "run money" customary in those earlier days.⁶ When Alaskans have been employed they, too, have been granted run money equal to about two-thirds of that paid the workers from outside. Otherwise the scale has been the same for both groups; that is, at so much per fish delivered in the round and with each of the two men in the gill-net boat credited with the boat's total catch. In addition the union exacts a bonus under stipulated conditions which usually occur. Many of the men receive as much as \$3,000 for a season's work lasting little more than a month, while the least fortunate or least skillful rarely earn less than \$500.⁷

6. Pacific Fisherman, Vol. XXXVII, No. 7, (June, 1939), pp. 11-12 presents in brief form some salient points of the 1939 agreement between workers and packers of the Alaska industry with comments from the viewpoint of the latter. They found it particularly irksome that the run money, now upped to \$150 for workers from outside, was still paid despite the fact that the sailors' union forbade the fishermen from working ship.

7. Arnold, op. cit., p. 125, gives as the average wage for these employee fishermen of Bristol Bay during the five months away from the home port in 1934 a sum of \$1,073.

It is said, indeed, that before the law barring aliens from fishing was stringently enforced, a few Norwegians commuted each year from their homeland to engage in a fishery so profitable.

In regions of Alaska other than Bristol Bay fish traps have been the most common form of company-owned gear. The per unit catch of traps may exceed in one day that of a gill-net boat for an entire season. The men who rig the traps, watch them while in operation and beach them again at the season's end have gone to Alaska about the middle of May and have returned by mid-September. They have received a monthly wage, in some cases supplemented by a bonus during the fishing season. Under present conditions their wages for the season will amount to \$400-500. Since 1936 the trap watchmen have belonged to the same union as the Bristol Bay gill netters.

All employee fishermen who have been brought from outside have been paid from the date of embarkation at San Francisco or Seattle to the date of their return to those ports. Where the company has not provided transportation in a ship of its own the employee fishermen as well as the maintenance men--but not the cannery labor--were usually granted first class fare on a regular steamship line. Since unionization became general in 1936-37 this has invariably been the case. Alaskan residents have received the same wages but have usually received no transportation allowance. The cannery labor, whether transported in a company ship or by one of the regular lines, has always gone in steerage.

Independent fishermen in Alaska, as in the states, have been made up largely of purse-seiners and trollers. Though some purse-seiners have operated company-owned gear, trollers have never done so; for their

catch goes to buyers who supply the market for fresh, frozen, and mild-cured salmon. The trolling method developed, and remains, entirely independent of canneries and trollersmen have always engaged in private ventures with privately owned boats and gear. Like the independent purse seiners they may be found fishing wherever the salmon are. The same troller may operate off the Columbia River or Swiftsure Bank one season and in Alaska the next. The system of compensation between the skipper and his boat puller has been discussed; as has likewise been the prices and methods of selling the catch.

The returns of independent Alaska purse seiners has hinged upon two sets of agreements--one between the skipper or owner and the crew,⁸ while the other has been embodied in the contract with the cannery whereby the company has agreed to pay for the fish delivered on an established per unit basis according to species, size, and quality. Many independent purse seiners have entered into no contracts--this is especially true of Puget Sound--but even they have usually made a verbal agreement with one cannery or buyer. Purse seiners operating company gear and boats have been paid at the same scale as the independents,⁹ and have sometimes been granted a bonus in addition.

In the coastal states and British Columbia gill netters have com-

8. Supra, Chapter III, Purse Seines, contains a treatment of share or "lay" system among purse seine fishermen.

9. In a few instances in which independent fish buyers or another cannery have paid more than the company owning the gear the employee purse seiners have become suddenly "unlucky" and have sold the fish where the profit was greatest.

posed the majority of fishermen. On both the Columbia and the Fraser where the greatest concentration of canneries developed and which are the two greatest gill-netting streams the majority of the fishermen have probably been employees, though not as utterly dependent upon the company as in Alaska. Both employees and independents have been effectively unionized only intermittently. Today, however, those on the Columbia have attained complete unionization while those on the Fraser have practically accomplished the same end. The price for fish on these major streams has usually been established by a pre-season agreement or contract and based on the state of the salmon catch, that is, for instance, fifty cents per fish for the first 500,000 delivered, thirty-five cents for the next 200,000, and twenty cents for the remainder. Chinooks have been excepted and paid for by the pound.

As has been repeated before this, the fishing season for all except trollers has been comparatively brief. Moreover, though complete figures are not available;¹⁰ it is unlikely that many fishermen earn enough during the season to support themselves during the balance of the year. Lumbering, farming, boatyard work, etc., undoubtedly absorbs some of them during the remaining seven or eight months, "but," concludes a study of unemployment in the state of Washington, "practically all persons working in the fishing industry are unemployed during a large part of the year."¹¹

10. Arnold, op. cit., Chapter XIII, does present some sketchy figures as to the earnings of employee fishermen.

11. William S. Hopkins, Seasonal Unemployment in the State of Washington, (Seattle, University of Washington, 1936), p. 124.

For more than sixty years the system of contract labor operating in the salmon canning industry was one of the most odious aspects of the Pacific coast labor structure. It had grown partly from the difficulties of direct dealing with non-English speaking Orientals and partly as an attempt of canners to shift responsibility. During its later years the latter reason was almost entirely the case.

With the exception of the foremen and small numbers of skilled workers in the canneries, most of the tasks have been largely routine and well adapted to the abilities of the great mass of cheap Oriental labor available in the coastal states. The introduction of the mechanical filling machine in 1884 and the "Iron Chink" in 1903, while reducing the number of workers required for specific processes, yet so facilitated expansion of the industry that greater numbers of cannery labor was in demand. Moreover, the workers thereafter could master their simplified tasks in relatively shorter periods of time.

Thus, for many years following the introduction of Oriental labor to the salmon industry by George W. Hume in 1872, the willingness with which Chinese and other Orientals worked for low wages kept them in great demand. In 1898, a naval officer, commanding a steamer making a survey of Alaskan fisheries, included in his report the following:

. . . The packing at all canneries is done entirely by Chinese, and it is very satisfactory labor. The canneries make a contract with the Chinese controlling the labor at a stipulated amount per case, guaranteeing a certain pack . . . they are conveyed to and from the cannery in ships, are given a bunk-house where they all live, are provided with water, fuel, and salt, and are

paid collectively, according to contract, from 40 to 46 cents a case, . . . The Chinese make all the cans, receive the fish . . . and do all the labor until the product is ready for shipment . . . They have their own bosses, are ready to work at any and all hours, and apply themselves strictly to the work . . .¹²

This description provides the outline but omits significant details.¹³ Obviously the contract system was subject to much abuse--especially among immigrant Chinese. The earnings of the contractor were in one way or another affected by the manner in which he fed, sheltered, and paid his workers. He might misrepresent the possible earnings at hiring time or he might abscond with the collective wage at the season's end. Often the laborers were forced to buy useless luxuries or pay exorbitant prices for necessities in order to get the job at all. Many of the contractors operated through rooming houses and clothing stores, and, in fact, the Oriental labor was fleeced in much the same manner as were sailors on the coast in the days of crimp and boarding master. In many cases, also, the workers were victimized by gamblers and sharpers included in cannery gangs with the contractor's connivance and at his profit. Nor were card sharpers the worst that some contractors eased into their gangs. In short, the system was conducive to graft and corruption of every description.¹⁴

12. Moser, op. cit., pp. 23-24.

13. Cf. Special Report on the Salmon Canning Industry in the State of Washington and the Employment of Oriental Labor, (Olympia, Wash., 1915).

14. U. S. National Recovery Administration, Hearings on the Codes of Fair Competition, Hearing No. 74, Canned Salmon, (Washington, 1934), provides an insight into the contract labor system; cited by Gregory and Barnes, op. cit., p. 124.

Naturally, such abuses caused dissatisfaction among the workers and were not productive of the morale which far sighted employers desired. Accordingly, some cannerymen decided early that any annoyances shifted to the contractor were more than balanced by those which he fostered and which plagued the packer. Therefore a growing number of packers dealt directly with their gangs from beginning to end and the contractor system, while common and one of the worst aspects of the industry, was never universal.

In addition to a growing sentiment against the system within the industry itself, the National Recovery Administration's proposed code for the salmon cannerymen, and the growth of unionization among the cannery workers at about the same time caused the industry to "voluntarily" give up the system in 1935.

Long before that date, however, the Chinese among whom it had originated were outnumbered by other Orientals. When the Chinese exclusion act cut off the source of a renewed supply from that quarter, the packers turned to Japanese. When they in turn were excluded, Filipinos gained the ascendancy while increasing numbers of Mexicans, Puerto Ricans and Kanakas were also hired along with growing numbers of Alaskan Natives.¹⁵

15. Bower, op. cit., 1937, p. 107, includes the following in his listing of shore workers of the Alaska salmon industry for 1937:

Chinese, 547
 Japanese, 939
 Filipinos, 3,804
 Mexicans, 620
 Alaskan Indians and Eskimos, 2,755

Today the contractor system appears to have gone for good and with it one of the two serious indictments made against the industry. When the packers have shown that they are no longer wasteful of the source of their supply and in processing methods, then the other indictment will also be dropped.

The tendency toward unionization among salmon workers, like the earlier tendency toward combination among salmon canners, paralleled a similar movement in other parts of the country. Successful unionization, however, besides coming much later to the industry has also been more complete. The number of fishermen's unions since the eighties has been legion, both of local and affiliated organizations but nearly all have been either short lived or else only intermittently effective. Their concern has been almost wholly over the price paid for the fish delivered, rather any matter of working conditions, and their strikes have invariably turned on prices. But in an industry where overproduction has been common and the supply has generally exceeded the demand to a point where large annual "hold overs" choke the warehouses, the packers have, in most cases, been less worried than the fishermen while the season slips by with no work done. Consequently, the fishermen usually have begun work at the packers' prices and have found their little success in an attempt to restrict competition by engaging the canners to buy fish only from union members.¹⁶

16. Contracts for this purpose were held illegal and in violation of the Anti-trust laws in a significant decision returned by Judge Claude McCulloch of the United States district court for Oregon on May 26, 1939. See Pacific Fisherman, Vol. XXXVII, No. 7, (June, 1939), pp. 17-18.

The somewhat peculiar conditions under which much of the Alaskan fishing has been done has made the Alaska Fishermen's Union more successful than others since its organization in 1902, and enables it to claim the oldest continuous existence. Even so, it was never strong outside of Bristol Bay gill-net fishermen until 1936 when the wave of unionization sweeping the country at that time enabled it to extend jurisdiction over nearly all the fishermen and transport workers in Alaska, with the exception of the purse-seiners and trollers.

Jurisdictional disputes between fishermen's unions are at least as difficult as those in other crafts and have had much the same results--leading on one hand to bloody and destructive conflict and, on the other, to consolidation. Since 1936, and largely under the inspiration of the Committee of Industrial Organization (C.I.O.), the Salmon Purse Seiners' Union of the Pacific, the Herring Fishermen's Union, and the Deep Sea and Purse Seine Fishermen's Union have all become strong and merged to form the United Fishermen of the Pacific. This merger enables purse-seine vessels and crews to engage in the California sardine or pilchard fishery, the salmon fishery, and the Alaska herring fishery in season. Along with the Alaska Fishermen's Union this newer United Fishermen's Union of the Pacific accepted a C.I.O. charter and both combined with smaller unions of fishermen to form the Federated Fishermen's Council with a total membership of approximately 20,000. At the end of 1938 they voted to accept a charter as the International Fishermen and Allied Workers of America under the aegis of the C.I.O.

Most of the unionization among cannery workers has developed since 1933 and is now practically universal for the American share of the industry at least. C.I.O. organizers, working with local and A.F. of L. unions and also in virgin territory effected the present unionization of cannery workers along industrial lines in 1937. The organization which resulted outdid any of the fishermen's unions in the length of its title: Local No. 1, North West District, of the United Cannery, Agricultural, Packing and Allied Workers of America.

All the above unions became affiliated with the Maritime Federation of the Pacific which had been organized by Harry Bridges of the longshoremen and Harry Lundeborg of the sailors following the great maritime strike in 1934. This federation combined all the sea-faring crafts on the coast, all the longshoremen, and many of the teamsters, and it likewise (except for the Sailors Union of the Pacific) had been chartered by the C.I.O. When the fishermen and cannery workers established this connection they acquired an implicit threat against the whole Alaska salmon canning industry which they have not hesitated to use.¹⁷ The vulnerability of the Alaskan industry to industrial action which prevents ships--its sole means of moving workers, supplies, and finished product is obvious.

Within the past two years, however, the American Federation of Labor has gained ground against the C.I.O. both among the salmon and the maritime workers. Harry Lundeborg led his Sailors Union of the

17. Pacific Fisherman, Vol. XXXVII, No. 7, (June, 1939), pp. 11-12.

Pacific out of the Maritime Federation at its fourth annual convention in the summer of 1938 and declared, "We don't want any more cannery workers telling us what to do."¹⁸ Thereupon the sailors returned to the A.F. of L. and their organizers became apostles of the Seafarers International Federation, as opposed to the C.I.O.'s Maritime Federation of the Pacific, and preached the word amongst fishermen's unions both for the coastal states and Alaska. In the former area they were fairly successful but the Alaska unions would not be proselyted and efforts to invigorate such moribund organizations as the A.F. of L.'s Alaska Salmon Purse Seiners' Union, which had lately been composed chiefly of Indians, was not encouraging. Nevertheless, the sailors' union by itself and with its fishermen adherents in the coastal states constituted a threatened conflict sufficient to derange the Alaska salmon industry--not to mention all others along the coast dependent upon waterborne transport. Finally, in February, 1939, the A.F. of L. did succeed in driving a wedge deep in the center of the Alaska salmon industry when many of the employees on cannery tenders were persuaded to forswear their recent allegiance to the C.I.O. and the Alaska Fishermen's Union and accept a charter from the Seafarers International Federation.¹⁹

Since that time the line-ups for a direct conflict between the two great systems of unions has existed and both the employers and the workers in the salmon canning industry have been threatened. On one side have been the sailors who man both the packers' ships and the

18. Time, Vol. XXI, No. 26, (June 27, 1938), p. 12.

19. Pacific Fisherman, Vol. XXXVII, No. 3, (March, 1939), p. 24.

common carriers running to Alaska. Supporting them have been the teamsters on Puget Sound and at other rail terminals and also the strategically placed tendermen in Alaska. The opposing line-up has consisted of most of the cannery workers in the Alaska industry, nearly all the white fishermen operating in Alaskan waters, and the longshoremen in both Alaska and the states.

To date, however, the dangers in the situation have lain more in possibilities than in actual occurrences. Delegates from the various unions in each line-up which have a stake in the Alaska salmon industry have effected a coordinating movement in Seattle.²⁰ The logic of self-preservation has kept any serious breach in abeyance.

In review, then, of labor in the salmon industry it may be concluded that the workers have, for the most part, been clearly differentiated along boundaries established either by craft or by race, with the result that there has been little cross-over and any adjustment has been horizontal; that with the abolition of the contractor system the worst feature of the labor situation within the industry has disappeared; and that unionization, strongly entrenched and complete, has for the industry as a whole appeared upon the scene since 1933. It is apparent, too, that for the time being the packers have accepted unionization, but that the situation between the two groups of unions is replete with serious possibilities, both for themselves and for the salmon industry.

20. Loc. cit.

CHAPTER VIII

INTERSTATE AND INTERNATIONAL PROBLEMS OF THE SALMON FISHERY

Fish are public property until they are caught--then they belong to successful fishermen.

Oregon State Planning Board.

Nature does not provide against . . . greed and it is doubtful if art can do it.

H. H. Bancroft

Someone has said that the American attitude toward the fisheries is typical of a pioneer society in an era of plenty. Perhaps a somewhat similar attitude prompted Governor Simpson of the Hudson's Bay Company when he referred to the apparent inexhaustibility of the salmon runs. But neither Sir George Simpson nor the first white men to pack salmon for market reckoned with the efficiency and intensity of modern fisheries methods. Even before the turn of the century it had become apparent that nature, unaided, could not adjust the salmon resource to the uncontrolled mass production techniques already typical of salmon canneries. Accordingly, the principle of conservation entered the thoughts of a minority of men, both without and within the salmon industry, and they struggled with a majority in a society still oriented to the concept of abundance.

Basic to all conservation techniques is the establishment of a reasonable relationship between the size of the catch and the number of fish allowed to proceed to the spawning grounds. The means to this end have been through law and administrative regulation. Fisheries bureaus

of the coastal states, the Federal government of the United States, and of the Dominion of Canada have applied themselves to the problem and have found that the solution does not lie simply with the nature and production factors.

Because salmon return in preponderant numbers to the stream of their origin, nature's arrangement within the framework of nature's physical geography would have made the answer not too difficult; if man had not compounded the problem by imposing his system of political geography and establishing boundaries inconvenient for purposes of conservation. Thus, on the northwest coast the problem of conservation, never simple in itself, has been made more difficult by questions of state and national jurisdiction which have required the cooperation of separate political entities for the preservation of certain salmon runs. Specifically, these runs are in the Columbia River, the boundary between the states of Oregon and Washington; and in the contiguous waters of the United States and the Dominion of Canada lying in the Puget Sound and Fraser River region. More recent than either of these problems is the question of exploitation of the Pacific fisheries, which Canada and the United States have claimed as their own, by nationals of countries across oceans, or in other hemispheres. Each of these problems will be treated separately.

WASHINGTON AND OREGON FISHERY PROBLEMS

In 1897 the fish and game protector for the state of Oregon included the following in his report to the Governor:

Legislative bills affecting our fisheries have been used as a football to be kicked about and traded for a vote for any political job or personal scheme, that members or lobbyists have desired to have passed.¹

Further along he added: "... no law for the protection and preservation of the fisheries of the Columbia River can be made effective unless adopted by other states."²

Thus the vulnerability of conservation measures to attack by pressure groups, and the necessity for interstate cooperation, was clearly indicated in a few succinct lines. The fish and game protector might also have mentioned the typical legislative toleration of gear and processes which, though destructive and wasteful, yet paid a high tax levy. Conditions in Washington were no different than in Oregon; the runs of the major salmon stream of the northwest were in jeopardy. The problem was not then new nor is it now one of the past. In another report to the Governor of Oregon, exactly forty years later, the following was included:

The obvious cure for conflict and delay in enacting uniform regulations for the fisheries of the Columbia River . . . is to draft a new interstate compact whereby complete authority over the fisheries is delegated to a commission

1. Fifth and Sixth Annual Reports, Oregon Fish and Game Protector, 1897-98, p. 3.

2. Ibid., p. 7.

with power to enforce its regulations and which is sufficiently removed from political influence to resist the demands of minority pressure groups in both states.³

Though this report showed that the problem was still pressing, it also revealed, by its advocacy of a "new" compact, that definite attempts toward a solution had been made.

Since Washington (1877) and Oregon (1878) had passed their first and different laws limiting the salmon fishing season on the Columbia, the legislation of the two states had rarely been in agreement.⁴ Consequently, the fishermen secured their licenses and delivered their catches upon whichever shore they found the laws most liberal. The states did strive, at times, to bring their regulations respecting the Columbia River fisheries into harmony; but when one legislature sought to adjust its code in accordance with the measures carried during the last session in the other state, they almost invariably discovered that the present session had repealed or modified the existing law at the behest of a special interest.⁵ Then the whole issue was at odds again. It would appear, however, that the Washington legislature made the greatest efforts for adjustment.⁶

In 1894 the office of fish and game protector for Oregon was occupied by Mr. Hollister D. McGuire, an ardent conservationist. He attempted to bring the issue to a crisis by declaring that the enabling act admitting Oregon to statehood had granted it jurisdiction of the Columbia to the

3. Commercial Fishing Operations on the Columbia River, op. cit., p. 39.

4. Ibid., pp. 37-39, contains tabulated laws of the two states respecting season and gear on the Columbia.

5. Fifth and Sixth Annual Reports, Oregon Fish and Game Protector, 1897-98, pp. 7-8.

6. Loc. cit.

Washington shore; and his officers proceeded to arrest and fine any one, fishing anywhere upon the river in violation of Oregon statutes. The following year, however, the United States district court for Oregon denied to Oregon officers the right of making arrests beyond the "middle channel" of the river unless a fisherman was found violating Washington law.⁷

Thereafter, officers of the two states kept to their own side of the "middle channel" and attempted to enforce only their own laws. This was accomplished with comparative ease in the case of operators of fixed gear; but wily fishermen using mobile gear and a little caution did very much as they pleased. Under these conditions of conflicting laws and ineffective enforcement the depletion of the salmon runs grew obvious during the decade following 1895. Packers and fishermen alike then became alarmed and joined force with the conservationist section of public opinion; but irreconcilable conflicts developed over the proper means of perpetuating the runs. Accordingly, each legislature was besieged, not only by lobbyists for sincere and honest conservationists, but also by others, present to work for their own special and selfish interests.

Packers and fishermen on both the upper and lower Columbia formed groups which sought legislation restricting fishing in the other portion

7. Third and Fourth Annual Reports, Oregon Fish and Game Protector, 1895-1896, pp. 28-30. It appears that the Washington fish commissioner may have encouraged the Oregon officers out of his desire to bring the whole matter forcibly to the attention of the public.

of the stream. Gill net and seine fishermen of the lower river declared that the traps and wheels of the upper section prevented a sufficient number of salmon from reaching the spawning grounds. Up-river interests accused those down stream of catching more than a just share. Finally, in 1908, the logic of both groups became so dulled by bitterness that each tried to legislate the other out of a livelihood. Down-river interests availed themselves of Oregon's experiment with initiative legislation and submitted to the voters of that state a measure designed to prohibit all fishing, except with hook and line, east of the juncture of the Columbia and Sandy Rivers. Up-river interests retaliated with another initiative measure which, in effect, prohibited practically all net fishing--the most productive method on the lower stream.⁸

To the consternation of each group, both measures passed. Oregon's master fish warden recognized advantages in the situation and he immediately enforced both laws as strictly as possible--and on the Washington as well as the Oregon side of the river--in an effort to focus public attention in both states upon the anomolous condition of the Columbia River fisheries. Washington officials soon obtained from the Federal courts an injunction restraining enforcement of the Oregon laws on the north side of the river.⁹ The case was carried to the United States Supreme Court which returned a decision in February, 1909.¹⁰ The limit

8. Mildred Vera Hayden, History of the Salmon Industry in Oregon, (Unpublished master's thesis, The University of Oregon, Eugene, 1930), pp. 38-39.

9. Report of the Master Fish Warden, (Oregon), 1908, pp. 129-33.

10. Nielsen v. Oregon, 212 U. S., 315.

of Oregon's jurisdiction over waters of the Columbia was again defined as the middle channel and the state was enjoined from enforcing its laws against Washington citizens fishing in compliance with their own laws on their own side of the river. Meanwhile the attention of the Federal Government had been attracted by a fear that the interests of the fisheries had been forgotten in the uproar. President Theodore Roosevelt, in a message to Congress,¹¹ had asked that the Federal Government assume control over the fisheries of the Columbia and other interstate rivers. This threat, and the impossible situation existing then on the Columbia, spurred the legislatures of Oregon and Washington to appoint committees which were convoked in joint meeting at Seattle early in 1909. With creditable unity of speed and purpose a program embodying proposals for identical measures respecting seasons and gear was drawn up, and the repeal of Oregon's initiative fishing laws was heartily recommended.¹²

Both states enacted the proposals into law, and though Oregon was accused of bad faith, apparently with justification,¹³ the agreement made by the joint committee continued in force until 1915. At that time both states undertook a complete revision of their fishery codes. They sought to clinch interstate cooperation by inserting in the new and similar codes adopted by both legislatures a clause establishing a compact to the effect that fishery laws affecting waters of the Columbia River should be "changed, altered, and ammended in whole or in part only with the mutual consent and approbation of both states." The

11. Congressional Record, 60th Cong., 1st Sess., Vol. XLII, Pt. I, pp. 68-84.
 12. Report of the Master Fish Warden, (Oregon), 1909, p. 11.
 13. Cobb, op. cit., p. 504.

necessary Congressional approval for such a compact was sought the same year but was not received until April, 1918.¹⁴

Since that date, then, the compact has been clumsy in operation. Its inadequacy has been suggested by a recent report to the Governor of Oregon which appeared at the beginning of this section. The same source continues:

. . . the compact regarding concurrent legislation has not ended continual negotiation between the fishery departments or between legislative committees but still permits delay in securing agreement and uncertainty of uniform enforcement. This machinery is too cumbersome to permit prompt changes in regulations, even when an agreement is reached.¹⁵

The dissatisfaction here expressed has prompted a movement, now afoot in the states of Oregon and Washington, to establish a permanent interstate commission with administrative and regulatory powers such as those to be enjoyed by the agency finally set up by Canada and the United States for the protection of the Puget-Sound-Fraser River sock-eye runs.

THE PUGET SOUND-FRASER RIVER FISHERY PROBLEM

For a century and a half fishery questions have affected the relations of Canada and the United States. By 1892, at the western end of the international boundary mutual concern for the preservation of

14. An act Ratifying a Compact between Oregon and Washington, approved April 1, 1918, 40 U. S. Stat. at L., p. 515. See also, Report of the Committee on Merchant Marine and Fisheries, 65th Cong., 2nd Sess., H. Reports, Vol. I, No. 360, Serial 7307.

15. Commercial Fishing Operations on the Columbia River, op. cit., p. 39.

the sockeye salmon was sufficient to invite attention from a joint commission, appointed to investigate the fisheries in territorial and contiguous waters of the two nations.¹⁶

Great schools of sockeyes have constituted the most abundant and valuable salmon runs in the maze of islands and waters through which the international boundary threads its way to the open ocean after its long, undeviating course along the forty-ninth parallel. These salmon, for the most part spawned in Canada's Fraser River, enter the Strait of Juan de Fuca on the Canadian side during their return migration. Until about opposite Victoria they continue to respect the international boundary. Near this point the runs split, a part proceeding northward on either side of the boundary west of the San Juan Islands. The balance move along the south side of those islands and well within American waters until they approach the continental land of Washington. Here again there is a split, a minor portion of the salmon turning to spawn in the small American streams while the majority swing northward to meet those which turned in that direction earlier, and join them in the great runs up the Fraser.

When the joint investigating commissioners examined these runs in 1895 they found them still abundant and heard of little trouble between fishing interests of the two nations. The American members of the commission did, however, recommend--but to no effect--that the stricter

16. Rathbun, "A Review of the Fisheries in the Contiguous Waters of the State of Washington and British Columbia", op. cit., p. 253.

regulations of Canada be applied in the United States.¹⁷ But within seven years the condition of the sockeye runs had changed. Salmon traps, only recently successful in Puget Sound, had become numerous in Washington waters. Their efficiency, combined with intensified fishing, with other appliances on either side of the border, had reduced the runs. Following 1902 there were mutual accusations and recriminations between Americans and Canadians which, in the end, led to more sober discussion. Regulations were made more stringent both by Canada and the state of Washington, but not sufficiently strict to halt decimation of the runs which Canadians had begun to claim as their own on the basis that the parent stream lay in their territory.

Finally, when no constructive local efforts for abatement of the problem were forthcoming in the state of Washington,¹⁸ the government of the United States was constrained to take action and withstand the resentment engendered by intrusion of Federal authority into a state's prerogative. The pressing nature of fisheries problems in boundary waters, by no means confined to Puget Sound, prevailed in the end, and on April 1, 1908, the United States and Great Britain concluded a convention for the protection and preservation of food fishes in the boundary waters of the United States and Canada. International commissioners were appointed--Dr. David Starr Jordan being one--and within

17. Message from the President of the United States relating to report of the joint commission in regard to the preservation of fisheries in waters contiguous to the United States and Canada, 54th Cong., 2nd Sess., H.R. Doc. No. 315, p. 178.

18. Canadian fisheries control has been vested in the Dominion Government.

two years they submitted recommendations which included detailed and uniform regulations for the waters of Washington and British Columbia.¹⁹

The Dominion Government enacted the recommendations into law but American special interests perfected a powerful lobby and the bill was shelved. When this fact became obvious to Canadians their act of acceptance was repealed.²⁰ During the decade following 1910 and the failure of the treaty, the sockeye runs continued an alarming decrease which was accelerated but not caused by the blocking of the Fraser River during the quadrennial "big year" run of 1913. An authority on the fisheries has observed this and declared that the only explanation lay in excessive fishing. He proceeded to describe the situation in the following terms;

. . . it is a wonder that any of the schools ever got to the spawning beds. Several abortive attempts have been made by authorities of Canada and British Columbia on one side and the State of Washington on the other to arrive at some equitable method for protecting this sockeye run. The former especially have professed an earnest desire to do something along this line, and there is no reason to doubt their sincerity. On the American side a few people, and among these a few of the more intelligent canners, pleaded for the enactment of laws that would adequately protect the salmon, but they were overborne by the great bulk of the packers and fishermen who, . . . insisted upon going ruthlessly forward with the slaughter, and when reproached with their shortsightedness clamored for the establishment of more salmon hatcheries, as though the latter could accomplish the miracle of increasing the supply of fry from a steadily decreasing supply of eggs.²¹

19. System of Uniform and Common International Regulations for Protection and Preservation of the Food Fishes in International Boundary Waters of the United States and Canada, 61st Cong., 2nd Sess., H. Doc. No. 638.

20. Cobb, op. cit., p. 506.

21. Cobb, op. cit., p. 507.

This prevailing problem, with its companions in other boundary waters, inspired a third joint commission and the American-Canadian Fisheries Conference. Its work, as regards the Puget Sound-Fraser River sockeyes, resulted in a Convention signed on September 1, 1919, but which was never ratified. The proposed treaty²² provided for an International Fisheries Commission²³ charged to investigate the runs and make recommendations for any advisable changes in the common regulations which the Convention had included in its proposals. The treaty was intended to remain in force for fifteen years, and thereafter until two years from the date when either nation gave notice of desire to terminate it.

Despite the failure of this convention when the Senate, again prompted by local opposition refused to ratify it, the general project was never abandoned. So, in 1929, representatives of the United States and Canada met once more and drew up a treaty somewhat similar to the one last proposed. This new instrument was signed on May 29, 1930, but six additional years elapsed before the Senate ratified it. In the summer of 1937 it became law,²⁴ though the regulatory powers of the three Americans and

22. Ibid., pp. 508-11, reproduces the salmon treaty in its entirety. See also, U. S. Dept. of State, Report of American Canadian Fisheries Conference, 1918, (Washington, 1920).

23. A similar commission, also an outgrowth of the 1919 convention, was successfully established by treaty between the two nations in 1924 with the purpose of rebuilding the even more seriously depleted high-seas Pacific halibut fishery. The successful conclusion of this treaty and the fact that the commission so established managed to save the halibut industry from extinction provided a significant and favorable precedent for additional endeavors.

24. Sockeye Salmon Fisheries. Convention between the United States of America and Canada, U. S. Treaty Series, No. 918.

three Canadians composing the International Pacific Salmon Fisheries Commission which the treaty established can not be invoked until 1945. The six-year delay in ratification was ended when Canada accepted three specific reservations imposed by the Senate. The first of these provided that the Commission should have no power to authorize any form of gear contrary to the laws of Washington or Canada; the second forbade regulation until scientific investigations had been pursued through two sockeye cycles, or eight years; and the third reservation established an advisory committee, representing operators of the various types of gear, who shall "collaborate" with the commission.²⁵ The Canadian Parliament did not, indeed, make strong objections to the first and last of the reservations, but that which forestalled regulation for eight more years, on the plea that additional scientific research was needed, met vigorous opposition. Finally, however, the view prevailed that the treaty should be accepted, despite such delay, as the only chance of preserving the fishery. Accordingly, the Canadian House of Commons (March 25) and the Canadian Senate (March 30) gave approval in 1937.

The Commission called for by the treaty has been appointed and is now engaged in its task. After 1945 it will have the right to limit or entirely prohibit sockeye fishing in the waters under its authority between June 1 and August 20 of any year in which it deems such action

25. "Puget Sound-Fraser River Sockeye Treaty is Ratified", Pacific Fisherman, Vol. XXXV, No. 5, (April, 1937), p. 33, comments on the treaty from the viewpoint of the American salmon industry. Mr. Miller Freeman, the editor of this organ of the industry, gave the treaty his valuable editorial and personal support.

advisable. In control over the important question of gear, the powers of the Commission are distinctly limited; for, in periods when fishing is allowed, citizens of both Washington and British Columbia can not be restrained from using any gear permitted by their respective fishery codes. The Commission does have power to improve the spawning grounds and to initiate fish-culture measures, the expense of hatcheries being divided equally between Canada and the United States. The treaty shall continue in force for sixteen years, and thereafter until one year from the date that either country gives notice of intent to terminate it.

Despite the fact that international cooperation was so long delayed, the Commission is encouraged by the apparent success of the United States Bureau of Fisheries in rebuilding depleted Alaskan runs since 1924. Canada has agreed to make the entire Fraser River basin available to the work of restoration and propagation. Optimism for the success of the Commission is further heightened by the fact that much of the Fraser River and most of its tributaries lie in a setting not conducive to the scale of human habitation found on the watersheds of more southerly salmon streams. Consequently the sockeye may be fostered in an environment more natural than that existing in most salmon streams south of the border.

JAPANESE AND THE AMERICAN SALMON FISHERY

Americans and Canadians, at last, have reached general and specific agreement concerning their common fisheries problems on both interior waters and the high seas. For the Pacific coast the principle of inter-

national cooperation through permanent joint commissions with administrative powers has been established; both for the preservation of the halibut (1924) and the sockeye salmon (1937). Accordingly, this chapter, which contains an outline of the events leading to the successful conclusion of one of those agreements, might end here for the present or return to gather threads of significant detail. But the scene must shift.

Before the most recent American-Canadian agreement had been solemnized a new problem had arisen--or rather, an old one had broadened; for the factory ships which Japanese brought to Bristol Bay are nothing new²⁶ and the controversy which came with them is nearly as old as man's fishing.²⁷

Thus, in the summer of 1938, newspapers along the coast bore headlines announcing Japanese "invasion" of Bristol Bay salmon fisheries and American fishermen talked of taking rifles with them to the North. The incidents behind these fears and threats had been observed for at least two years. In the winter of 1935-36 Japanese fishery operators

26. The factory ship and the problem is older than mechanization. The American whalers which carried the flag to all seas in the early half of the nineteenth century were factory ships, as were the deep-sea cod fishers of the Grand Banks, the Dogger Bank, etc.,--wherever the catches were prepared or preserved aboard. Modern factory ships have been used in the salmon fishery (Canadian), the tuna fishery, the herring and pilchard fishery, etc.; long ago their exploits caused international complications.

27. Joseph Walter Bingham, Report on the International Law of Pacific Coastal Fisheries, (Palo Alto, Calif., Stanford University Press, 1938), presents an outline of the history of the problem in its specific relation to the American-Japanese controversy.

had introduced into their Diet a petition to the effect that:

. . . the government should . . . immediately establish a policy of development of the open sea salmon fishing industry in the northeastern . . . Pacific Ocean, and should endeavor to effectuate such a plan.²⁸

The petition continued with statements which adequately reveal the reasons for the contemplated move.

There is little room for further expansion of the salmon fisheries that have been developed by our people on and off the far-eastern coast of the U.S.S.R., where the output is gradually dwindling. Of late the depression of the coastal fisheries of Japan and the exhaustion of the domestic fishing villages necessitates the development of new fields, this necessity being augmented by the increased population of the fishing people.

At this time the best salmon fisheries of the world are to the east of the North Pacific Ocean. We now observe the production of canned salmon on the coast of Alaska to an amount several times as great as ours yearly. Thus our fishery people are keenly hoping for the opportunity of salmon fishing in those waters.²⁹

Subsequently, that same winter, Ambassador Grew in Tokyo reported to the American State Department that the Japanese Bureau of Fisheries intended to conduct investigations during the next three seasons in the Bering Sea, but that no private ventures were to be licensed. When these two reports reached American packers and fishermen through the medium of their trade organ, the Pacific Fisherman, the implications filled them with anger and foreboding. They asked, quite reasonably, whether American expense and efforts for the preservation of salmon

28. Pacific Fisherman, Vol. XXXIV, No. 8, (July, 1936), p. 24 as supplied by private sources in Japan.

29. Loc. cit.

should be permitted to work for the benefit of peoples who had not contributed. Moreover, none could judge better than packers and fishermen the effectiveness of the great deep-sea gill nets, bent together in curtains three miles long, which the Japanese were reputed to use.³⁰ The prospect of uncontrolled fishing in the North Pacific by any foreigners made them indignant. When those foreigners were Japanese it was so much the worse.

For some years there had been rumors that the Japanese "floaters", or factory ships, long engaged in the crab fishery of the Bering Sea--and to which Americans made no objection--had also been canning salmon. Now that the Japanese Government, at the behest of its salmon fishery interests, sought to investigate the potentialities for Japanese salmon operators in the Bering Sea area the alarm grew and Washington was deluged with resolutions and telegrams.³¹ As men returned from Alaska in the fall they brought additional resentment with them when they asserted that the tremendous Japanese nets had been found in operation and pointed out that such gear was scarcely necessary for fishery "investigations". Fuel was added to the fire when the Pacific Fisherman, in its issue for May, 1937, presented the text of a pamphlet which had appeared in Japan under the direction of a Society of Oceanic Fishing Promotion.³² Some remarkable statements were included, among them the following:

30. Pacific Fisherman, Vol. XXXIV, No. 10, (September, 1936), p. 21.

31. Pacific Fisherman, Vol. XXXIV, No. 13, (December, 1936), p. 32.
At this time the Pacific halibut were also threatened but by a British factory ship.

32. Ibid., Vol. XXXV, No. 6, (May, 1937), pp. 19-22.

" . . . the Sea of Bering . . . [is] . . . no longer pictured as a 'northern sea of howling waters' or as a sea close to the north pole, but as an extension of the Bay of Tokyo."³³ The pamphlet expressed hurt surprise at the American attitude--both as regarded proprietorship of the salmon and the destructiveness of Japanese gear--and then continued:

Perhaps it is not unnatural for American fishermen to stretch out their imagination to these extremes with regard to the Japanese fishing method, because it was American fishermen who, catching the Sockeye going up the Canadian river Fraser at the Juan de Fuca strait, decimated the catches.³⁴

Of these statements the Pacific Fisherman editorialized: "It is simply a bald and blunt revaluation of the Japanese attitude and intention-- or at least of that element in Japan which desires to invade the American fisheries."³⁵

In March, 1937, representatives of a Japanese can company had approached Seattle salmon packers with a proposal for open sea canning operations off the coast of Alaska. Japanese equipment and labor were to be used, but the financing was to be divided between American and Japanese capital.³⁶ Though this offer was rejected, an accusation that Japanese and American capital had collaborated was made during the summer and it led the journal of the American salmon industry to declare unequivocal opposition to American financing of fishing enterprises in the hands of foreigners anywhere.³⁷

33. Ibid., p. 21.

34. Loc. cit.

35. Loc. cit.

36. Ibid., Vol. XXXV, No. 4, (March, 1937), pp. 9-11.

37. Ibid., Vol. XXXV, No. 9, (August, 1937), p. 25.

During the 1937 season in Bristol Bay a leading packer chartered a plane and, with another packer and the representatives of two fishermen's unions in the party, obtained indisputable photographic evidence,³⁸ that several Japanese factory ships were canning salmon. Before this both labor and operators had called the situation to the attention of the Bureau of Fisheries and the State Department but no observable action had been taken. Now, however, those agencies were subjected to an intensified and sustained bombardment which brought an official investigation; barely in time, it would appear, to prevent the Maritime Federation of the Pacific, with which most of the fishermen's unions were affiliated, from instituting a boycott against Japanese goods and an embargo on shipments to Japan.

The Japanese Government, in reply to the American State Department, insisted that it had granted no licenses for salmon operations in Alaskan waters. The State Department had, however, sent agents to Alaska who undoubtedly returned information to the effect that, regardless of official Japanese sanction, factory ships of that nation's registry were engaged in salmon canning. Accordingly a strongly worded note outlining the American attitude toward Alaskan salmon fisheries was addressed to Japan in November, 1937.³⁹

Meanwhile Congress had taken the question into consideration. On

38. Ibid., p. 22-25.

39. Dept. of State, Press Releases. State Department Summary of Statement made November 22, 1937, by the American Government to the Japanese Government in Connection with the Alaska Salmon-Fishery Situation, March 25, 1938, pp. 412-17.

June 17, 1937, Mr. Anthony J. Dimond, the Alaskan delegate introduced a bill (H.R. 7552) for the protection of Alaskan fisheries from foreign encroachments. Two days earlier a bill (S. 2679) with the same purpose had been introduced by Senator Homer T. Bone of Washington. On November 15, Mr. Dimond presented to the House a second bill identical with the Senate measure. Hearings on Mr. Dimond's latest measure were held in February, 1938, with representatives of the American salmon industry strongly urging immediate action.⁴⁰

This and a subsequent bill (S. 3744) introduced by Senator Royal S. Copeland of New York both asserted the American ownership over salmon spawned in American streams. Mr. Dimond's measure sought to extend the jurisdiction of the United States to the limit of the continental shelf. Senator Copeland's bill was designed, however, for application only in the Bering Sea and was based on a presumption that those shallow waters⁴¹ are not truly a part of the ocean but merely cover a slightly submerged portion of American land. None of these measures carried, and additional ones, for a similar purpose, which have been introduced since have fared no better. Not only because Congress objected in principle to such legislation, but because representations of the State Department had resulted in an informal agreement whereby the Japanese Government submitted to a termination of its fishery investigations in

40. Alaska Salmon Fishery, Hearings before the Committee on Merchant Marine and Fisheries on H.R. 8344, 75th Cong., 3rd Sess., p. 78.

41. Much of the Bering Sea--like a great part of the Baltic--is less than 100 fathoms (600 feet) in depth.

Bristol Bay and the Bering Sea. On March 25, 1938, the State Department issued a summary of the discussions between the two governments.

The Japanese, "without prejudice to the question of rights under international law", gave assurance that they would "continue to suspend" the issuance of licenses to ships projecting salmon operations in the Bering Sea.⁴² The American State Department commented:

. . . these assurances of the Japanese Government are regarded as regulating the situation until such time as the problems involved may call for, and circumstances may render practicable, the taking of other measures.⁴³

Thus the issue rests, for the present, with a Japanese concession before an American assertion of rights. In the spring of 1938 a few crab-packing ships did return, as usual, to the Bering Sea. Even they left much earlier than had been their habit--probably because of frequent inspections by boarding parties from the United States Coast Guard vessels charged with the Bering Sea patrol.⁴⁴

There the matter stands; and until such time as the larger questions in eastern Asia are settled, and unless the Russo-Japanese dispute centered in the salmon fisheries of Siberia and Sakhalin are amicably resolved, or the Asiatic salmon runs become even more seriously depleted, the suspense may continue and the American salmon may remain included in the history of the United States and Canada alone.

42. Dept. of State, Press Releases, op. cit., p. 412.

43. Loc. cit.

44. According to statements made to the writer by members of the crew of the Coast Guard vessel Cyane.

CHAPTER IX

SUMMARY AND CONCLUSION

The American salmon industry has been a regional one, peculiarly affected by its physical setting and the necessary geographical dispersion of its operating centers along a stretch of the North Pacific coast extending from the fortieth parallel to the Arctic Ocean. In addition to the geographical limitations under which the industry has operated, it has also been subjected, more than most fisheries, to other natural conditions imposed by the biology and habits of its raw material--the five species of Pacific salmon.

The characteristics of these anadromous fish have conspired to make them vulnerable to many types of gear, of which, however, only four have been of major importance to the salmon industry considered as a whole. None of these four methods--gill nets, traps, purse seines, and trolling lines--are strictly indigencous with, or peculiar to, the Northwest salmon industry, though all but the purse seine were, indeed, among those appliances used by the Natives to take salmon before the arrival of the white man. It is probably true that these forms of gear all found their greatest development in the salmon fishery, and since 1864, when the first cannery was established. The four types became of significance to the industry, roughly, in the order listed above. The first three developed to the support of canneries, which have taken the greatest share of the catches. The fourth method--

trolling--came most recently to general use and since about 1912 has been the mainstay of the fresh, frozen, and mild-cured salmon trade. All the gear has been relatively simple in operation and the increase in its efficiency has been far more the result of the introduction of the motor power in boats used for fishing, or as tenders of fishing gear, than to improvements in the gear itself. Besides having been relatively simple in operation, three of the four principal forms of gear have been such that they were not beyond the reach of the independent fisherman with a moderate outlay of capital. The fish trap has, however, been an exception and its large initial cost, the greater expense of its maintenance and operation, and its great efficiency and dependability have tended to make it a method generally limited to cannery ownership and, moreover, one of the chief factors in the greatest expansion of the canning industry--especially in Puget Sound and Alaska. These same factors have caused the trap to be carefully restricted on the charge that it affords monopolistic control of the raw material of the industry. Though the trap today catches about half the salmon canned in Alaska--which area, in turn, accounts for about half of the world's production, no true gear-monopoly exists, nor does it appear that one has existed.

Before the advent of salmon canning in 1864 the history of the industry was, for the most part, closely bound to the exploitation of the Oregon country by the Hudson's Bay Company or by the American pioneers in the Willamette and Columbia River valleys. In those times the salmon went to market through channels already established by the fur trade.

The crude methods of preserving, such as salting, pickling, and smoking which were the resort of those early salmon packers made it difficult to place a satisfactory product on distant markets. Salt, the primary essential for such methods, was then so scarce in the Northwest that the salmon were often insufficiently cured and thus established a bad reputation. After 1830, however, a limited export trade in salmon, chiefly with the Hawaiian Islands, was developed and carried on by the Hudson's Bay Company from its posts at Forts Vancouver and Langley. American enterprise also ventured into the business and one American, Nathaniel J. Wyeth, projected an ambitious plan for competing with the Hudson's Bay Company in both the fur and salmon trade. He succeeded at neither, and for the same reasons that most such independent ventures failed before the courteous but firm competition of the Hudson's Bay Company came to an end in the Oregon Country following the establishment of the forty-ninth parallel as the international boundary in 1846. After that time pioneer conditions were still sufficiently persistent along the Pacific Coast to preclude adequate transport or markets for a trade in barrels of salted salmon. Despite the inrush of population following the discovery of gold in California and growing markets for food products the salmon business scarcely benefited. The strangeness of the product or its bad reputation, and the clumsiness of the containers retarded the industry even though greater potential markets and more adequate transport were then present. The industry needed, as it proved, the new method which shortly arrived.

The means of preserving food in tins was first applied to salmon within the United States on the Sacramento River in 1864, but within two years the pioneer canners had shifted to the Columbia and thus began a movement typical of the canning activities since that time. Few industries have undergone such a rapid shift in the center of activity. By 1884--just twenty years after the first salmon were canned--there were four canneries in southeastern Alaska, two in central Alaska, and one in western Alaska; while, at the same time, the plants operating in the coastal states and British Columbia were numbered in scores. Those same twenty years had witnessed on the Columbia River the developments within the industry which were to remain typical. Technological improvements in the canning process, and the establishment of successful marketing techniques led to mass production. At the same time the industry began to assert upon the regional population and labor structures the influence which has continued as the canning business pursued its northward trek in search of additional raw material.

Following 1888 and the news of phenomenal Alaskan packs, in direct contrast with dwindling salmon runs in the streams of the coastal states, the northward shift of the industry was even more rapid. This accelerated northward movement in the years 1888-1890 resulted in the over-production which still haunts the industry. As a result of such over-production the salmon industry, paralleling a similar movement elsewhere in America, had by 1890 developed a tendency toward combinations and mergers which continues to the present. Except for a brief period in central Alaska during

the nineties, such combinations have never effected a monopoly of raw material or production. For most of the present century Alaskan plants have canned more than half of the world's annual pack of salmon. Until 1924 the Alaskan production was, in the main, regulated only by the market, but since that time conservation measures which appear effective have been invoked. Despite depleted runs of the choice chinook and sockeye salmon in nearly all waters, the annual pack of the industry, as a whole, has been increased, partly by conservation measures, but more largely by tapping runs which were more remote, or of the cheaper grades.

Coincidental with the shift of the industry to sparsely populated regions, especially in Alaska, the necessity of importing the greater part of the labor arose. The problems of hiring, housing and feeding the workers caused additional responsibilities to devolve upon the packers. Many sought to evade the obligation through resort to the contract labor system which, until its abolition in 1935, caused the workers to be victimized by the abuses inherent in such a system and, moreover, subjected the packers to serious indictment from the public. The N.R.A. Code proposed for the industry in 1934 was not only partly responsible for the abolition of the contractor system, but it also gave rise to the practically complete unionization of the salmon workers, both on shore and on the water. Before that time little unionization existed except among the fishermen, and few of their organizations were effective. Nearly all unions of workers in the salmon industry have

been organized since 1933 and most have been included in the C.I.O. Though the A.F. of L. has made definite inroads during the past three seasons, the C.I.O. still remains dominant. The unions of salmon workers have been affiliated, either through the C.I.O. or the A.F. of L., with all the maritime workers of the Pacific Coast, and this fact has provided them with an implicit threat which they have not hesitated to use.

Finally, the salmon fishery, like others pursued in the boundary waters between states or between nations, has resulted in jurisdictional disputes. The states of Oregon and Washington have engaged in conflicts over the Columbia River fisheries, and after a series of contretemps, successfully concluded an interstate compact for the protection of the Columbia River salmon in 1915. The agreement has not, however, proved entirely satisfactory and at present (1940) there is a growing sentiment for a new compact which would establish a permanent joint commission with regulatory powers similar to those enjoyed by an international commission already appointed in an effort to rebuild the Puget Sound-Fraser River sockeye runs in which Canada and the United States are mutually interested. This American-Canadian joint commission was established by treaty between the two powers as late as 1937, and was the successful culmination of a series of abortive agreements dating from the beginning of the present century. Both of these interstate and international fishery agreements were long blocked by special interests and, though both eventually materialized, such interests had succeeded in

limiting their effectiveness. Neither agreement, it should be mentioned, was arrived at until the dangers of extinction of the particular salmon runs had become imminent.

International problems springing from the northwestern salmon fishery have not been limited to Canada and the United States. Japanese salmon packers, as a result of the depletion of the east Asiatic salmon runs, invaded the waters of the Bering Sea during the seasons of 1936 and 1937. Though their operations were conducted from factory ships on the high seas they caught salmon spawned, and destined to spawn, in Alaskan streams. The American State Department, prompted by salmon packers and salmon labor, forcefully conveyed to the Japanese government the fact that the United States regarded salmon spawned in American streams as subject to exploitation by Americans only. Japan gave assurances that the venture in the Bering Sea would be suspended, and Japanese salmon packers have not reappeared in those waters. For the time being, then, the matter rests but it is probably not closed.

Thus the salmon industry has contributed to the destiny of the Northwest. It will doubtless continue to do so.

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