THE CHANGING GEOGRAPHY OF SALMON CANNING IN BRITISH COLUMBIA, 1870-1931

by

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The Changing Geography of Salmon Canning in British Columbia, 1870 - 1931

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ABSTRACT

Between 1870 and 1931 two cycles of expansion and retrenchment characterized the growth of salmon canning in British Columbia. Each period of expansion produced a distinctive geography, shaped by linkages between the species of salmon targeted, fishing methods used, and techniques employed inside the canneries. And each period of expansion ended in crisis, with over investment, over capacity, and excessive competition plaguing the industry. Each time, British Columbia Packers provided the solution by consolidating salmon canning companies and closing redundant plants.

From 1870 through 1901 the industry's geography reflected a dependence on sockeye salmon. Large numbers of sockeye ran to the Fraser, Skeena, and Nass Rivers, and Rivers Inlet, where they were easily caught using small boats and gill-nets. Small, largely manual canneries were able to pack all the fish caught, and these canneries clustered in the estuaries of the sockeye rivers. When too many canneries and overproduction paralysed the industry following the 1901 season, the British Columbia Packers Association was formed. The association took over forty canneries, closing twenty-eight of them by 1906.

From 1906 through 1927 expanding markets and declining sockeye runs forced canners to target the other species of salmon. These fish ran to the developed rivers, but also ran in numbers to rivers outside of the sockeye districts. A new fishing technique, purse-seining, enabled canners to harvest these new fishing grounds cheaply, while faster, more mechanized canning lines allowed them to pack large numbers of these fish quickly, and at less cost. During this period salmon canning dispersed to all areas of the coast.

By 1927 excess investment and wasteful competition again plagued the industry. When poor runs that year threw the industry into turmoil B.C. Packers again provided the answer. The company merged with two other firms, controlled forty-one canneries, and closed twenty-five of them by 1931.

Despite the large number of canneries involved, neither consolidation fundamentally altered the geography of salmon canning. Although B.C. Packers concentrated its production into fewer canneries, it continued to operate plants in all canning districts. Technological limitations prevented any inter-district centralization of operations.

For my mother

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PREFACE

The primary objective of this thesis is to examine and explain the changing geography of British Columbia's commercial salmon canning industry between 1870 and 1931. Used in this context an examination of the changing geography includes: 1) the changing distribution of salmon canneries along the provincial coast--where and when salmon canneries were built, and where and when many of them were closed; 2) the changing patterns of production within the industry, which includes the changing size of the provincial salmon pack; where salmon canning occurred along the coast; the changing species composition of the pack, both provincially and within each canning district; the changing importance of each canning district; and, finally, how these changing patterns of production related to the changing distribution of canneries; and 3) an interpretation of the reasons underlying these changes.

To achieve this examination a variety of factors were studied. These included technological change within both the fishing and canning sectors of the industry, changes in the use of the resource base (the different species of Pacific salmon),

fisheries regulations, how the industry was financed, markets, changes in industrial structure, and, perhaps most important, the absolute and relative location of salmon canneries both along the coast, and within each of the salmon canning districts. Because the geographical importance of each of these factors varied throughout the periods studied, they are not accorded equal treatment for each period. Nor is each discussed to the fullest, for a detailed examination of the individual components of the industry is not the objective. Instead, this study tries to show how, together, these components shaped the expansion of salmon canning in British Columbia, then traces the resulting pattern.

Two sizable consolidations, or mergers, occurred during the study period, one in 1902, the other between 1926 and 1928. Both involved the British Columbia Packers Limited, and in both B.C. Packers acquired over half of all the salmon canneries operating in the province.[1] In the years that followed each consolidation, many of the plants involved were closed. Consequently, a secondary objective was to examine the impact of B.C. Packers on the geography of the canning industry during these years. Studying the circumstances surrounding each consolidation, and the locations of the plants closed and kept open, should highlight problems and operating constraints faced by all salmon canners during each study period.

The period, 1870 to 1931, was chosen because it marks two complete cycles of expansion and retrenchment in the province's salmon canning industry, the four periods that comprise these

cycles provide the time structure. Chapter 1 describes the industry's growth and spatial expansion from its beginnings, about 1870, through 1901. It discusses the industry's northward spread along the Pacific coast; the influence of the physical environment on the successful operation of a salmon cannery; the fishing, tendering, and canning methods used; the financing of operations, and the marketing of the pack; and how the combination of these factors not only produced a unique geography, but encouraged and inevitably led to over investment and over-production. Crisis followed the record pack of 1901. The formation of B.C. Packers represents the industry's response to that crisis. The new company consolidated thirty-three canning companies, taking control of forty of the province's seventy-seven salmon canneries. In 1906 only twelve of these forty plants operated. Chapter 2 examines the period 1902 to 1906, assessing the impact of these closures on the industry through a discussion of how salmon canning was carried out in each of the provincial canning districts.

While B.C. Packers was closing canneries, especially on the Fraser River where over investment was most crippling, other companies were building new plants in the north. Thus began the industry's second period of expansion, a northward expansion that occurred in two stages: the first was largely a continuation of the earlier years; the second radically transformed the geography of salmon canning, for it targeted different species of salmon, and used different fishing techniques. Chapter 3 examines this transformation from 1906

through 1925, and concludes by discussing the salmon canning activities of B.C. Packers, the industry's largest company, during these years. Chapter 4 is similar to Chapter 2. Like the first expansion period, the second ended with the industry in crisis; again, B.C. Packers provided the solution. Between 1926 and 1928 the company was involved in three consolidations, which brought forty-one canneries under the company's control. By 1931 twenty-five were permanently closed. Chapter 4 discusses the years 1926 to 1931, examines the closure of canneries both within each district and provincially, and assesses the impact of these closures on the industry's geography. The chapter concludes by summarizing the changing geography of British Columbia's salmon canning industry over its first sixty years, and the role that B.C. Packers played within the industry.

Although many people have contributed to the completion of this thesis, some deserve special thanks. Dr. Arthur Roberts sparked my interest in the early salmon fishery by hiring me as a researcher on a British Columbia Heritage Trust project that he co-supervised. The project involved compiling an aerial archaeological inventory of all salmon canneries known to have operated in British Columbia, and the two glorious summers that we spent flying along the coast of British Columbia in CF-PUC, at altitudes between 1500 and 2000 feet, photographing each of the cannery sites, gave me a close-up view of the environmental context of salmon canning, an appreciation of the rewards and

pleasures of hard work, and memories that enabled me to survive the dog days of thesis writing that were to follow. The task of initially locating the cannery sites fell first to Dr. Robert Galois, and later to Logan Hovis; without their work much of this thesis could not have been written.

I came to this study without any background in, and little knowledge of, the west coast salmon fishery, and my understanding of the early industry has benefitted from numerous discussions with industrial historian Duncan Stacey, and with Dr. Frank Millerd of Wilfrid Laurier University. Each shared with me the insights of their own research, and each provided me with documents that were indispensable in researching my own thesis.

I was indeed fortunate when Dr. Cole Harris of the University of British Columbia took an interest in this study early on. In spite of heavy demands on his time he always found time to talk, and to help me work out difficulties. His advice was invaluable; his enthusiasm infectious.

Throughout all of this, my academic supervisor, Dr. Paul Koroscil, remained patient and understanding. He endured countless missed meetings and deadlines, allowed me to learn by making my own mistakes, but whenever needed was there to help me along in the right direction.

Finally, my deepest gratitude is to Susan. She convinced me to return to University, supported me when I did, tolerated my moodiness, offered encouragement when I needed it the most,

kept our household functioning, and while doing all of this found time to complete her own Master's degree.

CHAPTER 1

FOCUSED EXPANSION, 1870-1901

The salmon canning industry in British Columbia developed rapidly during the last quarter of the nineteenth century. The province's first canneries were built on the Fraser River about 1870, but within a decade the industry had moved northward to establish itself on other provincial river systems. In each of these canning districts salmon canners concentrated on packing sockeye, one of the five species of Pacific salmon common to provincial waters. Although sockeye represented only a fraction of the total number of salmon that returned to the rivers each year, canned salmon was the province's fastest growing export staple from 1870 through 1900. By 1900 the salmon canning industry was second to mining in the value of dollar exports.[1] But continued prosperity depended on a delicate balance between supply and demand; the nature of salmon canning worked against maintaining this balance. Low entry costs, easy financing, and the prospect of high profits attracted many small, financially weak firms to the industry. Too many canneries threatened not only to saturate markets, but to divide the total catch so many

ways that for many canners returns might not meet expenses. Both of these conditions plagued the industry in 1901 and by the season's end the British Columbia salmon canning industry was in crisis.

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Commercial salmon canning was introduced to the west coast of North America on California's Sacramento River. Working in an old river scow and a few wooden cabins on the shore Hapgood, Hume and Company packed approximately 2,000 cases of Chinook (or Spring) salmon in 1864.[3] The acceptance of their product, and the financial success of their first year of operations, spawned an industry that soon spread along the length of the Pacific coast. Canneries were erected on the Columbia River by 1866, on the Fraser River about 1870, and in Alaska by 1878.

In British Columbia, the first salmon canneries were constructed along the banks of the Fraser River to take advantage of the river's large runs of sockeye salmon. Sockeye are oilier and redder in colour than the springs packed on the Sacramento and Columbia Rivers, but market resistance to these qualities was soon overcome and sockeye became the preferred species in the British market.[3] With the feasibility of canning sockeye established, canneries were soon built to harvest other rivers that supported sizable sockeye runs: the first salmon canneries operated on the Skeena River in 1877, on the Nass River and at Alert Bay off Vancouver Island in 1881, and on Rivers Inlet in 1882.

One explanation for this quick move to northern waters is that those who financed the industry desired a more stable return on their investment. Although the Fraser River had by far the largest sockeye runs in the province, the runs followed a distinctive four year cycle. The year having the greatest numbers of fish returning is called the dominant year; the following year, the sub-dominant, may also produce a good run, but not as large as the previous years'; runs during the next two years are much smaller. Other major sockeye rivers in the province do not exhibit this cyclical pattern, so investors encouraged canners to exploit them in order to balance the irregularities of the Fraser River pack.[4] But canners on the Fraser in the early years had just barely begun to tap the river's resources. Both the number of canneries operating on the river, and the size of the packs, were small. A change in the number of canneries operating from year to year had more to do with the annual variations in pack size than did fluctuations in the numbers of sockeye available (pack statistics do not reflect the quadrennial cycle until after 1890). Furthermore, the men building canneries in the north were not involved with canning operations on the Fraser. Some had gone north with the intention of finding new salmon streams on which to construct a cannery, whereas others had long been familiar with the northern areas through their involvement with church missions, the fur trade, or gold exploration along the river valleys that led into the provincial interior.[5] Therefore, the early movement to

northern rivers represented more than an expansion of a canning industry based on the Fraser River.

The success of the early canners, both on the Fraser and in the north, drew others to the industry, and marked the beginning of a salmon rush. By 1901 roughly thirty-six salmon canneries had been built outside of the Fraser River district. On the Fraser, fifty-six canneries are known to have been built before 1901; ten more are thought to have been built, but precise construction dates and locations are unknown; and a further thirty one canneries are thought to have succeeded earlier operations, and utilized existing sites and structures. Four canneries had also been built in Vancouver Harbour. In total, at least ninety-six separate cannery sites were developed in the province between 1871 and 1901.[6]

Although commercial salmon canning in British Columbia began later than canning on the Sacramento and Columbia Rivers, and took advantage of markets already opened by American canners, the British Columbian industry was not an extension of the American. Technologies and techniques were similar, but were introduced to the province by men who had gained their experience in Scotland or New Brunswick, not on the rivers of California or Washington State.[7] A small number of American companies eventually built plants in British Columbia, in 1881 the Dominion Commissioner of Fisheries report estimated that Americans controlled between 20 to 36 percent of the capital invested in British Columbian canneries, but the Anglo-British Columbia Packing Company Limited acquired most of the American

interests when it was formed in 1891.[8] For the most part, direct participation of American canning companies in the British Columbia fishery remained small, and though similarities existed, the British Columbia salmon canning industry developed independently of its larger American counterpart.

In British Columbia, the salmon canners targeted sockeye; the large number of sockeye that ran to provincial rivers, and the biological cycle of the fish, made it adaptable to early commercial exploitation. Like the other species of Pacific salmon, sockeye are anadromous. They are hatched in fresh water lakes and streams, eventually migrate to salt water where they spend the majority of their adult life, then return to fresh water to spawn and die. In the ocean, the fish feed voraciously, growing to their full size and strength,[9] and on re-entering the river estuaries the fish are at the peak of their commercial quality (they cease feeding after entering fresh water and their flesh quickly becomes soft and unsuitable for canning). Their habit of rising close to the surface in schools allows them to be caught efficiently, using the simplest of fishing techniques. The large numbers of fish caught, and their uniform size, is ideally suited to factory processing. Once caught, however, the quality of raw salmon soon deteriorates, limiting the distance the fish can be transported for processing. To ensure that the salmon did not spoil before being canned, canners had to locate their plants as close as possible to the fishing grounds.[10]

To build their plants canners had to find sites that met certain environmental requirements. All canneries outside of the Fraser River area relied on coastal steamers to bring in the machinery, supplies, and labour necessary for the season's operations, and to transport the pack south, to Steveston or Victoria, at season's end; consequently, a tidewater berth large enough and deep enough to accommodate these steamers, preferably accessible twenty-four hours a day, yet offering enough protection for the unloading and storage of small fishing boats, was a desirable, if not mandatory requirement for a canning site. As was a gently sloping foreshore that would accommodate the driving of pilings. Such a foreshore allowed the cannery to be built over the water, which minimized the time and labour spent handling the fish, both in its raw and canned forms, and provided easy disposal of offal and other refuse--workers simply washed it through the floorboards. As well, this type of foreshore allowed the fishing boats to be pulled easily out of the water for safe winter storage. A reliable water supply was also necessary. Water was usually taken from streams running through or adjacent to the cannery property, or from nearby lakes. Dams were constructed to impound the water and wood stave mains were used to transport it to the cannery settlement, where storage tanks were often built to ensure a continued supply should the natural source be interrupted.[11]

The Claxton site, located just outside the mouth of the Skeena River, is an example of a location exhibiting all these characteristics. With the cannery built far out over the water,

the site provided good deep water access to the plant, commodious boat storage, and a creek flowing into the embayment. The B.C. Packers 1902 Cannery Report referred to the site as "unquestionably the finest location on the Skeena."[12]

Despite the importance of each of these environmental requirements, seldom were all of them met to satisfaction. The advantage of one or more attributes of a site often overcame its liabilities, resulting in less than ideal operating conditions. Although rated as one of the finest sites in the province, the Nass Harbour Cannery on the Nass River was poorly situated,

> the cannery having been built entirely on mud sills, and the water line at low water, being over 200 feet in front of the cannery, thus necessitating a long wharf and warehouse, both of which could have been rendered unnecessary had the cannery been farther out, or on the opposite shore of the Harbor, where deep water is easily obtainable.[13]

The long wharf necessary to accommodate steamers meant great inefficiency in the storage and loading of the pack, yet the cannery operated, without major alteration, from 1881 through 1928. Easy accessibility by water was another requirement that was frequently compromised, especially in the Skeena and Nass River estuaries where the extensive sand bars and mud flats prevented coastal steamers, and fishing boats, from reaching many of the canneries at low tide. A good supply of fresh water was more important. Numerous canneries were abandoned after being built because of a lack of fresh water.[14] Others continued operating with only the bare minimum of supply, the cannery manager having to adjust the hours of work according to the height of water in the reservoir or the storage tanks.[15]

Sometimes, the choice of a suitable canning site was as much good luck as good planning. In the winter of 1881 Robert Draney had decided to build his Rivers Inlet Cannery on Shotbolt Bay, but the captain of the ship delivering the construction materials unloaded them three miles up inlet from the selected site. Unable to move the materials, Draney built his plant where they were dropped, and the cannery operated for fifty-three years.[16] Proximity to sockeye runs, however, was essential. Sizable runs were known to exist in the Fraser, Skeena, and Nass Rivers, Smith and Rivers Inlets, Lowe Inlet, and in the vicinity of Alert Bay on Vancouver Island. By the turn of the century canneries had been built to exploit each of them.

Unlike the United States fishery, where any form of device to trap or catch fish could be used, British Columbia canners relied primarily on gill-nets to supply their canning lines.[17] The gill-net, or drift net, works as a temporary meshed barricade in which fish become entangled by their gills as they attempt to pass upstream. Working initially from small, oar and sail powered flat-bottomed skiffs, two men, a puller and a net man, would make a set.[18] While the puller rowed the skiff across the current of the river, the net man would lay out the net over the stern. With approximately two-thirds of the net out the puller turned downstream and the remainder of the net was laid out. When the set was completed the net formed an "L" shape at right angles to the current. After drifting for a time, the net would be taken in: the puller rowing backward

against the line of the set as the net man pulled in the net and removed the catch.[19] Although the principles of the gill-net fishery were the same in each district, different conditions on the fishing grounds dictated how they could be successfully employed. Strong tidal influences on the Skeena and Nass Rivers meant sets could only be made on the outflowing tide. Fishermen then used the incoming tide to help carry them back upstream in preparation for another set. On Rivers Inlet, the clear waters limited fishing to the hours of darkness until a less visible net twine became available.[20]

Initially, fishermen worked the waters immediately surrounding the cannery and delivered their fish directly to the cannery wharf. This system soon changed, however, as the number of fishermen in each district increased, and competition for fish forced them to journey greater distances from the cannery. These distances quickly became excessive at a time when oars and sail provided the only motive power, so to reduce the time spent in transit canners adopted more efficient delivery systems. A cannery tug or tenderboat would tow the small boats of the gill-net fleet to the fishing grounds at the beginning of each week. Once there, the fishermen remained on the grounds until the weekend closure, delivering their catch daily to a cannery fish camp or collector (tender) boat. The practice of using tenders to transport fish from the grounds to the cannery was well established on the Fraser River as early as 1878. At first tenders collected the salmon directly from the fishing boats, but by 1881 this system had been refined, with each cannery

establishing fish camps, either floating or shore based, at strategic locations on the fishing grounds. An empty scow would be placed at the camp into which fishermen would unload their catch, the numbers of fish delivered being recorded by a tallyman. This system greatly increased the efficiency of the collection system because the tender no longer had to wait to load or unload. At the camp a full scow was simply replaced by an empty one, at the cannery the reverse occurred.[21] Outside of the Fraser River district canners used both fish camps and collector boats.

Notwithstanding differing local conditions, the gill-net fishery was ideally suited to the river channels and narrow inlets that incise the British Columbia coast. The small boats and the gill-nets required relatively little capital investment, and in most areas cheap Indian labour was available to work them. The use of the fish camp and tenderboat system allowed fishermen to remain on the grounds all week making maximum use of both fishing time and fishing gear, which canners owned and rented to the fisherman on a weekly or seasonal basis.[22] And because steam powered vessels travelled much faster than the fishing boats, the raw fish arrived at the cannery in a fresher condition.

Although gill-nets were the most common type of fishing gear used along the British Columbia coast, not all canneries relied on them for their supplies of salmon. A few canneries, built to take advantage of smaller sockeye runs, received exclusive rights to exploit these runs using beach, or drag

seines. Methods of laying a beach seine differ, but the principle is the same: with one end of the net secured in water too shallow for the salmon to swim, the other, with the net scraping the bottom, is swept around in a semicircular path trapping the fish in the net's enclosure.[23] This type of fishery could be successfully carried out near the mouths of small rivers or streams, if the beach was gently sloping and free of snags or obstacles. Examples of canneries built to take advantage of beach seining grounds were Alert Bay, on Vancouver Island, which was eventually granted exclusive seining rights on the Nimpkish River; Lowe Inlet and Namu, which used seines to fish a number of streams in the vicinity of the canneries; and the Quashela and Smith Inlet canneries, constructed to exploit the seining grounds at the mouth of Wyclees Lagoon, which connects Smith Inlet to the principal spawning tributary of Long Lake.[24] The use of beach seines provided canners large quantities of fish at a very low cost, as the seine operated similar to a salmon trap without the high, fixed capital investment. Regulations regarding their use were also difficult to enforce, and some canners appear to have encouraged their seine crews to break Dominion fisheries regulations. John Williams, Inspector of Fisheries for British Columbia District Number Two, commented that the unlawful obstruction of streams was the most common violation:

> To enable them [the Indian seine crews] to catch more salmon, for which they are paid five cents each, by the canners, they obtain a piece of gill net and make it fast across the creek (some 100 yards up stream from the mouth), from one side to the other, being a deep net and the creek

> shallow, it drags the bottom with an overlap, upon which they pile rocks and brush, making a barricade that no mature salmon can pass through; the fish finding the creek impassable, generally turn back, but some persist in descending [sic] the creek and get gilled in the net; those that return to the mouth of the creek swim round and round until they are eventually caught by the Indians in their drag seines.[25]

Once caught and delivered to the cannery wharf, the salmon were taken to the fish house where a skilled Chinese butcher took just eight strokes of his knife to remove the head, tail, and fins, slit open the belly, and scrape out the entrails. Slimers finished cleaning the fish, rinsing them in tanks of fresh water. After cleaning, the salmon were carried in baskets to the cutting table, where they were carved into can length pieces, and then to the filling table, where these pieces were put into cans. Tops were placed on the cans, the lids soldered shut, and the cans lowered into cook kettles, large vats of boiling water, to test for leaks. This also gave the salmon their first cook. Afterwards, the cans were vented by puncturing the lid, the hole was quickly resealed with solder, and the cans returned to the kettles for the second cook. Once cooked, the can was struck with a nail-like piece of metal, the pitch of the sound revealing the condition of the contents. If satisfactory, the cans were painted with lacquer to protect them from dirt and rust, then boxed and stored in the warehouse until shipment.[26]

As in any line process, the speed of each procedure was matched to the speed of the line. Machinery that increased the pace of a particular operation was wasted if the pace of other

parts of the line were not similarly increased. Procedures where production bottlenecks occurred stifled the introduction of other available technologies that could speed up processing--the bottlenecks would simply worsen. Once a bottleneck was eliminated, other technologies could also be adopted. The production bottleneck on the canning line during the early years was at the cooking kettles.[27]

The first major innovation to the canning line, the steam retort, was aimed at this bottleneck. Introduced in the late 1870's, the retort was essentially a large pressure cooker that replaced the kettles of boiling water previously used to cook the fish. The retort reduced cooking times and initiated the adoption of other pieces of equipment that would permit increases in production. By the mid 1880's soldering, filling, and salting machines, and the gang knife were all in use. Little technological development occurred between the early 1880's and 1890, and innovations after 1890 were for the most part refinements to existing machinery. The exception was the steam box, a device used to exhaust air from the cans before they were sealed. This had been accomplished by placing the sealed cans in boiling water for 45 minutes, (the first cook) then venting and resealing them before sending them to the retort for cooking. The steam box eliminated the need for this step, and the high temperatures inside the box further reduced the cooking time in the retorts.

Yet not all technologies introduced during this period were adopted by all canners, especially in British Columbia.

Most canners continued to have Chinese workers make up the cans before the fishing season began instead of purchasing ready made cans, even when ready made cans became more economical. This practice enabled canners to offer the skilled Chinese workers a longer period of employment, which helped ensure that an adequate number of these workman were available when packing started. Nor were automatic filling machines used in most provincial canneries. British consumers complained of the poor appearance of machine-filled cans, the result of the salmon being rammed into the can by a mechanical plunger. Hand filled cans were much neater and commanded a higher price.[28]

Generally, plants outside the Fraser River district were slow to be fitted with newer machinery,[29] but even on the Fraser the degree of mechanization introduced in each plant must have varied considerably. Pack statistics from the turn of the century show a great variation in the seasonal output of each cannery: in 1900 the average output for Fraser River canneries was 6,903 cases, with a range of 26,695 cases; in 1901, perhaps a better year for comparison because all canners prepared for as large a pack as possible, the average output per cannery was 20,386 cases, with a range of 33,698 cases.[30] The number of boats fished by each cannery, the proficiency of the fishermen employed, and the skill of the plant's management and work force undoubtedly accounts for some of this variation, but the degree of mechanization applied in each plant must also have had an influence. Mechanized plants were presumably more efficient and able to put up larger packs.[31]

Salmon canning was a seasonal industry. The isolation of the sockeye runs, and their short duration, meant that the canneries were in use for only a few weeks each year. Outside of the Fraser River area workers began arriving by coastal steamer about two months before the sockeye started running. During this period Chinese men made the cans, Japanese men built or repaired the boats (Indian men might also perform this task), white machinists readied the canning line, while Indian women made or mended the nets. Once the season opened Japanese, Indian, and White males fished, but seldom, if ever, in the same boats; Chinese men unloaded the boats and scows, butchered the salmon, soldered and cooked the cans, then cased them for storage and shipping. Indian women and children slimed the butchered fish, carried the clean fish and empty cans to the filling tables, and filled the cans. Whites worked as managers, foremen, bookkeepers, storekeepers, engineers, and mechanics.[22] Racial segregation in the workplace carried over to the layout of the small settlements that surrounded each cannery. There were separate bunkhouses for Chinese and Japanese workmen; a large number of Indian huts to accommodate families, often located near the periphery of the settlement; accommodations for whites, bunkhouses for single men, houses for families; and a managers house. In addition to the housing and cannery, a typical settlement included a warehouse, a cannery store, and sometimes a machine shop and boat repair shop.[23] While the sockeye were running, anywhere from three to eight weeks, the settlement functioned as a completely self-contained, vibrant,

complex, multi-racial community; immediately after the peak of the run passed though, everything was cleaned and prepared for winter storage, workers left on the steamers, and only a caretaker or millwright, his family, and perhaps one or two others remained through the off season.

The seasonality of salmon canning led to difficulties in financing canning operations during the early years. The isolation of plants required that all arrangements for the season be completed in advance of the season's opening. Canners had to estimate the size of run and order adequate supplies of tinplate and solder to ensure enough cans were made to put up the expected catch; machinery, fishing boats, and nets had to be ordered, repaired, and readied for use; and a cannery crew had to be hired, often through a Chinese contractor, who was paid a set amount based on the estimated size of the pack.[34] Because canners paid for all of this in advance, most of their operating capital was put up before the season opened. Returns on the pack were not realized until it was sold, perhaps eighteen months later, and during the interim canners had to prepare for the next season. To finance their operations, canners came to rely on advances forwarded by the commission agents responsible for marketing the pack. Under the protection of a chattel mortgage, these agents advanced the money necessary to prepare for and put up the season's catch, and were paid back when the pack was sold. They also outfitted the canner with the necessary materials, and insured the pack until it was sold,

apparently charging a considerable mark-up on each of these services.[35]

This method of financing the industry had an indirect bearing on the number of canneries that were built, or operated, in any given year. During years when the market price of canned salmon was expected to be low, canners dependent on advances might not be extended credit. In effect the agent acted as a check on the number of operating canneries.[36] When market conditions were favourable, the opposite occurred. Agents supplied both money and materials to the canner, as well as transporting and selling the season's pack, their profits multiplying with the number of canneries backed. With no incentive on the part of agents to limit or restrict the number of advances, many small companies gained access to the capital necessary to enter the industry.

* * * * *

At the end of the nineteenth century the British Columbia salmon canning industry focused exclusively on sockeye salmon, and the geography of the industry reflected this. Sockeye ran in large numbers to the Fraser, Skeena, and Nass Rivers, and to Rivers Inlet, and salmon canneries clustered within these estuaries. A handful of canneries were also scattered about the outlying areas to harvest smaller runs. All of the canneries were small, single line plants, with predominantly manual canning lines. Mechanization aided some of the hand operations, but the upper limit of productivity had been reached. A

bottleneck at the beginning of the line where the fish were butchered and cleaned determined the pace of the canneries; any further increase in plant capacity required increasing the number of butchers and adding more canning lines.[37] There were good reasons why this did not happen. First, because the canning line was not fully automated, more lines required a proportional increase in crew size. Workers, particularly the highly skilled butchers, were becoming increasingly scarce and expensive, making multi-line plants more expensive to operate.[38] With the exception of the larger, limited liability companies that emerged in the 1890's, there was insufficient capital available to build and operate large plants.[39] Second, variability in the size of salmon runs, the intensive competition between an excessive number of canneries for fish, and the inability to transport raw fish long distances to supplement the local supply of fish prevented any significant economies of scale being realized in larger, multi-line plants.[40] The ideal plant was one large enough to handle the good runs, but small enough to minimize the excess packing capacity lying idle during off years. Single line canneries remained the most efficient, flexible, and practical production unit. Their low level of mechanization kept construction and operating costs relatively low, and during the industry's embryonic years gill-netting provided an efficient, inexpensive means of securing raw fish. As a consequence entrance into the industry was easy, and the attraction of large profits for a small investment drew many small, financially weak firms to

participate.[41] These firms found ready financing from commission agents, and later from banks, who, having originally avoided the industry, were anxious to gain a share of its success.

Success for the industry, and the individual canners, depended on maintaining a favourable balance between supply and demand, and ensuring that the total pack was not split too many ways. Too many canneries worked against both objectives, and the combination of above factors encouraged the construction of too many canneries. Seventy-seven canneries prepared to pack salmon in 1901 (many more had been built, but had already closed for a variety of reasons). Forty-nine of these were on the Fraser, seventeen more than had operated in 1895. Since 1901 was a big year on the Fraser, all canners prepared for a large pack. Many borrowed heavily to do so. Their expectations were met, but operating costs were unexpectedly high. A floor price of ten cents per fish was set at the beginning of the season, the same price as in 1897, but during that season the price had dropped as low as two cents at the height of the run. In 1901 the price remained constant over the entire season (a concession fishermen had won through their strike in 1900), pushing up production costs and forcing canners to overextend themselves financially to put up the large number of fish caught.[42] At the season's end a record pack of almost one million cases of sockeye had been put up; however, most canners made little or no profit on their season's work.[43] The large pack flooded the market and 180,939 cases of salmon were carried over to the

following year. Returns to canners were slower than usual; loans remained unpaid. Concern that the market price might be dropped to clear the carry-over threatened to upset the industry completely.[44]

These events affected all canners, but the smaller, financially unstable firms were pushed to the margin of collapse. Even though the bankruptcy of these weaker companies would eliminate a large number of participants from the industry, the stronger canners, along with bankers and commission agents, realized that the insolvency of small operators would not solve the industry's problems. Each knew that if widespread bankruptcies occurred, the assets of the failed companies would be sold at receivership sales at well below market value. Since established canners had all of the equipment they required, they feared newcomers would buy the equipment at a low cost and be in a position to pack and sell salmon cheaper than those companies that had continued operating.[45] An industry wide merger offered a more acceptable solution.

The merger of small companies had been successful before when the industry was threatened by problems of overcapacity and over production. Most of the larger, limited liability canning companies operating in the province had been formed in this manner, and their emergence had done much to stabilize and strengthen the industry during earlier periods of recession. Able to employ more sophisticated management strategies, these larger companies enjoyed good profit levels and were

instrumental in convincing the banks to reconsider their earlier reluctance to provide financial assistance to canners.[46] Another incentive to consolidate was the success of the Alaska Packers Association (A.P.A.), which was formed out of circumstances very similar to those existing on the Fraser. In 1888 seventeen canneries had operated in Alaska. The profits made that season were so attractive that thirty-seven plants canned salmon in 1889, leading to a glut of Alaskan salmon on the market and to large carry-overs. An attempt to redress this situation led to a voluntary agreement between individual packers for 1890 and 1891: wherever several plants were operating in proximity to one another, all but one of them would close. This agreement was formalized in 1892 with the formation of the A.P.A. Acting as a profit sharing organization, with participating canners given shares proportional to the their respective packs in the preceding year, the association closed all but nine of its thirty-one canneries. Acknowledgment of the arrangement's success came when the owners incorporated the A.P.A. as a company in 1893, converting the value of their shares into capital stock. Issued at $65 per share in 1893, in December of 1901 the stock traded on the San Francisco Exchange at $165.25. The Association had also paid almost $3,500,000 in dividends over the eight years, improving both its canneries and fishing fleets at the same time.[47]

The Alaska Packers Association provided a blueprint for consolidation, and Henry Doyle, who promoted the merger idea in British Columbia, based his proposals on it. Doyle stressed the

success of the A.P.A. in his "Report on the British Columbia Salmon Industry," and argued that a similar association could solve the problems facing provincial salmon canners. The proposed new company would acquire as many canneries as possible, reduce the number of canneries operated, introduce sound management practices at both the head office and plant levels, and establish special departments charged with realizing the "greatest economies" through purchasing supplies, marketing the pack, and other tasks better handled by a large company.[48] Doyle set out the process of merger in a confidential prospectus sent to each of the province's canners. The prospectus emphasized that the new company's objective was not simply to buy out and retire the present owners, but to amalgamate the present operations. Each cannery purchased would be paid for on a one-third cash, two-thirds stock basis, with all supplies and material on hand being paid for in cash.[49] In this manner each canner would have sufficient cash to pay off debts, and, as stockholders of the new company, would have its best interests in mind.[50] The necessary financing for the consolidation was arranged through its co-promoter, Aemilius Jarvis. As the President of Aemilius Jarvis and Company, Investment Bankers and Brokers, Jarvis was well known and respected in eastern Canadian financial circles, and had organized a syndicate of prominent eastern businessmen willing to invest in the proposed company.[51]

Doyle's plan offered a way out of the crisis of 1901: it provided the owners of the small, financially weak canning companies a profitable exit; the more established and

financially more stable canners would benefit from reduced competition whether or not they actually took part in the new merger; and the banks, seeing the consolidation as a way for canners to clear their loans, urged indebted canners to participate in the scheme.[52] With the hope of bringing stability to an industry characterized by chaotic entrepreneurialism, the British Columbia Packers Association of New Jersey was chartered on April 8, 1902. Although the new company assumed control of its canning properties too late into the season's preparations to implement all the changes its management desired, the course the new company would follow soon began to be charted.

Chapter 2

BRITISH COLUMBIA PACKERS AND THE CLOSURE OF SALMON CANNERIES, 1902-1906

The British Columbia Packers Association of New Jersey dwarfed any previous consolidation in the British Columbia salmon canning industry; thirty-three canning companies merged to form the association. Together, these companies owned forty of the seventy-seven canneries that had packed salmon in 1901. The distribution of these plants along the coast gave the new company representation in all but one of the province's canning districts, (the Nass River) and an overwhelming presence on the Fraser River, where it owned 59 percent of the total number of plants (Table 2-1). Nevertheless, Henry Doyle failed to induce most of the province's major canners to participate in the merger. Most of the thirty-three companies taken over were the smaller firms that had verged on bankruptcy. Only two of the companies owned more than one cannery and operated in more than one canning district. Of the remaining thirty-one firms, seven operated plants in the northern districts, and twenty-four operated on the Fraser River (Table 2-2). Many of these Fraser

TABLE 2-1

DISTRIBUTION OF CANNERIES ACQUIRED
BY B.C. PACKERS IN 1902

District	Plants owned by B.C. Packers	Total Number of Plants Operating in District in 1902
Fraser River	29	49
Rivers Inlet	4	6
Skeena River	3	11
Outlying	3	5
Vancouver Island	1	
Nass River	0	2

River companies (71 percent) had entered the industry after 1895 and, to a large degree, had precipitated the industry's problems.

As a new company B.C. Packers had two immediate concerns. First, the company had to close a large number of its plants, particularly on the Fraser, and enlarge the canning capacity of those kept operating. Second, because salmon processing was B.C. Packers' sole activity, unlike many of the larger canning companies that had added salmon canning to their existing interests in merchandising or insurance, reorganization of production had to proceed in a manner that was immediately profitable.

By 1904 almost half of the plants acquired in 1902 were closed and dismantled. B.C. Packers, with Doyle as general manager, seemed to be following his plan to reduce the number of

TABLE 2-2

CANNERIES ACQUIRED BY B.C. PACKERS IN 1902

Operational Canneries

Canning District and Cannery Name	Acquired From	Date of Construction
Fraser River		
Acme	Acme Canning Co. Ltd.	1899
Albion Island	Albion Canning Co.	1899
Alliance	Alliance Canning Co. Ltd.	1895
Anglo-American	Anglo-American Canning Co.	1896
Atlas	Atlas Canning Co.	1895
Boutilier	Boutilier & Co.	1895
Brunswick #2	Brunswick Canning Co.	1897
Brunswick #1	Brunswick Canning Co.	1893
Canadian Pacific	Canadian Pacific Packing Co.	1893
Cleeve Canning	Cleeve Canning & Cold Storage	1897
Colonial	Colonial Canning Co.	1897
Currie-McWilliams	Currie-McWilliams & Fowler	1897
Dinsmore Island	Dinsmore Island Packing Co.	1894
Ewen (Lion Is.)	Ewen & Co.	1876
Greenwood	Greenwood Canning Co.	1899
Hume's	John Hume & Co.	1896
Fishermen's	Laurent Guichon Estate	1894
London (Lulu Isl.)	London Canning Co.	1891
Pacific Coast	Pacific Coast Packing Co.	1893
Premier	Premier Canning Co.	1897
Provincial	Provincial Canning Co.	1896
Imperial	Robert Ward & Co.	1893
Terra Nova	Terra Nova Canning Co.	1892
Wellington	Victoria Canning Co.	1880
Harlock	Victoria Canning Co.	1887
Delta	Victoria Canning Co.	1878
Celtic	Welsh Bros.	1897
Westham Island	Westham Island Canning Co.	1896
Westminster	Westminster Packing Co.	1896

TABLE 2-2--Continued

Canning District and Cannery Name	Acquired From	Date of Construction
Outlying Districts		
Bella Coola	Clayton Canning Co.	1900
China Hat	Toms, Morris & Fraser	1900
Lowe Inlet	Victoria Canning Co.	1890
Rivers Inlet		
Brunswick	Brunswick Canning Co.	1897
Wadham's	E.A. Wadham's estate	1897
Vancouver	Vancouver Packing Co.	1897
Wannock	Victoria Canning Co.	1884
Skeena River		
Balmoral	Balmoral Canning Co.	1883
Cunningham's	Robt. Cunningham & Sons	1883
Standard	Victoria Canning Co.	1889
Vancouver Island		
Alert Bay	Stephen A. Spencer	1881
Non operational Canneries		
Fraser River		
Bon Accord	Ewen & Co.	1886
Sea Island Cannery	Ewen & Munn	1890
Nass River		
Cascade	Victoria Canning Co.	1889
Rivers Inlet		
Quashela	Victoria Canning Co.	1883

SOURCE: Henry Doyle, "Rise and Decline of the Pacific Salmon Fisheries," University of British Columbia Library, Special Collections Division, Vancouver, British Columbia.

NOTE: This list of canneries does not agree with lists given in either Cicely Lyons, Salmon, Our Heritage: The Story of a Province and an Industry (Vancouver: Mitchell Press Ltd., 1969), or Helen Lee, "Corporate Strategy in the British Columbian Fish-Processing Sector" (M.A. Thesis, Simon Fraser University, 1983). Checking the above list against pack statistics from the time, and with Doyle's notes when he was manager of B.C. Packers, supports the above list.

salmon canneries operating in the province. But considering these closures in aggregate obscures how this rationalization policy was carried out. Plant closures were not random. In some districts few canneries were closed, whereas in the Fraser River district the company completely transformed existing production patterns. There are two important aspects to be considered: first, implementation of this rationalization program in each of the canning districts; second, an assessment of the program's impact on the company, the industry, and the geography of salmon canning in British Columbia.

The Fraser River

The areal extent of salmon canning on the Fraser River grew considerably between the early 1870's and 1900. Initially centred around New Westminster, competition between fishermen forced much of the fishing activity to shift downstream, and new canners entering the industry, desiring locations close to the fishing grounds, followed. By the mid 1880's the majority of canneries were located on the river's lower reaches. Fishermen, outfitted with cannery owned boats and nets, concentrated their efforts at the river mouth and overcrowding was commonplace on the fishing grounds by 1889. The Dominion government attempted to control this situation by restricting the number of fishing licences it issued, but this scheme, begun in 1889, was abandoned in 1893 and the number of boats again increased.[1] The introduction of the more stable round bottomed boat and the hard twine gill-net allowed fishermen to venture further out into the

Gulf of Georgia, temporarily relieving the overcrowding,[3] however, by the early 1900's the number of boats fishing at the mouth of the Fraser River was so great the Royal Commission of 1905 reported that nets effectively barred the river, making it impossible for the salmon to pass.[3] Although 90 percent of the salmon taken from the river were caught around the river mouth, in either Canoe Pass, the main river, or the North Arm, by 1900 the fishery extended from approximately ten kilometers outside of the river's mouth to the area between the New Westminster and Mission bridges,[4] and forty-nine canneries lined the banks of the river from New Westminster to Steveston, from Canoe Pass in the south to the North Arm (Map 1).[5]

B.C. Packers acquired twenty-nine canneries on the Fraser. Small companies, their plants reflecting their lack of adequate capital, had built most of these canneries, and many operated unprofitably.[6] With a few notable exceptions, almost all the canneries B.C. Packers acquired had less money invested in machinery than was average for the Fraser River at the time; all but three of the companies that began canning in 1895 or later were in this group (Table 2-3). Dated machinery resulted in slower canning lines and smaller packs. In the five years prior to the amalgamation, the average packs put up by the canneries B.C. Packers acquired were considerably smaller than the average pack per Fraser River cannery. Four year running averages make the same comparison. But not all the plants taken over were inadequately equipped, poorly performing operations. Some had good equipment installed in sound buildings, and these canneries

TABLE 2-3

ESTIMATED VALUE OF MACHINERY IN FRASER RIVER SALMON CANNERIES, 1902

Cannery	Value of Machinery (Dollars)	Cannery	Value of Machinery (Dollars)
Acme*	6,321	Cleeve*	11,021
Albion*	10,148	Atlas*	9,138
Alliance*	5,573	Dinsmore Island*	9,000
Anglo-American*	8,483	B.C. Packing Co.	6,500
Boutillier*	6,500	Phoenix	16,000
Brunswick #1*	12,292	Britannia	15,000
Brunswick #2*	15,125	British America	9,000
Canadian Pacific*	10,836	Canoe Pass	8,000
Colonial*	8,043	Wadhams	12,000
Currie McWilliams*	10,317	Star	9,590
Celtic*	8,555	Fraser River	8,662
Delta*	10,007	Vancouver	8,222
Ewen*	18,488	Empire	9,946
Fishermens*	8,547	Federation	16,274
London*	8,547	Great Northern	8,000
Greenwood*	6,985	Industrial	8,500
Hume's*	9,520	National	7,500
Harlock*	7,022	St. Mungo	12,000
Imperial*	9,946	Beaver	9,166
Provincial*	7,923	Richmond	7,296
Pacific Coast*	10,640	English Bay	15,000
Terra Nova*	8,538	Gulf of Georgia	18,000
Westham Island*	8,629	Scottish Canadian	15,000
Westminster*	6,960	Deas Island	12,500
Wellington*	8,572		

SOURCE: D.J. Munn and A.P. Larsen (valuators) to Aemilius Jarvis, May 8, 1902, Henry Doyle Papers, Box 11 File 12, University of British Columbia Library, Special Collections Division, Vancouver, British Columbia.

*Denotes cannery taken over by B.C. Packers.

provided a foundation on which the new company could anchor its policy of plant consolidation.

For management purposes, and to provide a spatial framework for its program of plant consolidations, B.C. Packers divided the Fraser River fishery into five smaller districts: Canoe Pass, Steveston, Main River, North Arm, and New Westminster.[7] Each of these districts corresponded with recognized fishing areas on the river and with the clustered distribution of the canneries taken over. The company then began to phase in its plan to consolidate operations on the river. One cannery in each district was designated as the main plant for that district. These plants, Brunswick #2 in Canoe Pass, Currie Mcwilliams on the main river, Imperial at Steveston, Terra Nova on the North Arm, and Ewens for the up-river area around New Westminster, were to be renovated, or rebuilt, and their packing capacity increased by adding a second canning line. The necessary machinery for these additional lines would be taken from the canneries that were closed. With their expanded packing capacity, each of the main plants would put up the entire Association pack in its district.

Taking active control of the canneries on May 20, 1902, B.C. Packers made no major renovations to building or plant that year, although the company permanently closed seven canneries prior to the fishing season (Table 2-4). The majority of plants closed, the Wellington and Harlock plants of the Victoria Canning Company, Fishermen's, and Westham Island, were located in the Canoe Pass-main river area. All were small canneries,

TABLE 2-4

DATES OF CANNERY CLOSURES ON THE FRASER RIVER*

Cannery	Management District	Date Closed
Westham Island	Canoe Pass	1902
Anglo-American	Canoe Pass	1914
Brunswick #2	Canoe Pass	1930
Wellington	Main River	1902
Harlock	Main River	1902
Fishermen's	Main River	1902
Delta	Main River	1903
Albion Island	Main River	1918
Currie-McWilliams	Main River	1920
Boutilier	New West	1902
Premier	New West	1902
Westminster	New West	1904
Cleeve Canning	New West	1910
Ewen (Lion Is.)	New West	1930
Alliance	North Arm	1903
Provincial	North Arm	1903
Greenwood	North Arm	1903
Dinsmore Island	North Arm	1914
Celtic	North Arm	1918
Acme	North Arm	1918
Terra Nova	North Arm	1928
London (Lulu Island)	Steveston	1902
Brunswick #1	Steveston	1903
Hume's	Steveston	1903
Atlas	Steveston	1914
Colonial	Steveston	1914
Canadian Pacific	Steveston	1918
Pacific Coast	Steveston	1918
Imperial	Steveston	

*Canneries are grouped by management district and ordered within that district by closure date.

and although the Victoria Canning Company's operations were competitive, the structures were old, having been built in the 1880's, and B.C. Packers was able to continue operating three good plants in the vicinity. The company also closed two plants on the New Westminster waterfront, Boutilier and Premier, and the London Cannery in Steveston. With these closures B.C. Packers appeared to be carrying out its unofficial mandate to reduce packing capacity on the river.

The consolidation of operations really began with preparations for the 1903 season. The company initiated a massive program to expand its primary canneries, improve its secondary plants, and continue closing others. The most ambitious project involved the construction of a new Imperial Cannery at Steveston, by now the heart of the province's canning industry, with a cannery row lining the riverbank for over two miles. B.C. Packers consolidated the Imperial, Brunswick #1, Hume, and London plants, all built adjacent to each other, into one plant, the province's largest. The old Imperial cannery was torn down and a new one built in its place, four canning lines were installed, and the Brunswick #1 and Hume canneries were closed, their structures converted into a pack warehouse and a net house for the new Imperial. In the other management districts, the Currie McWilliams, Brunswick #2, and Terra Nova canneries each received a second canning line,[8] the Ewen plant getting one a few years later, and the company closed the Delta, Alliance, Provincial, and Greenwood plants; the last three all located on the North Arm.

Over the next four years the strategy behind B.C. Packers' operations on the river became apparent. Expecting poor runs in 1904 the company operated only ten canneries. These included Albion Island, Acme, Celtic, Canadian Pacific, and Pacific Coast, in addition to the five primary canneries. Of the six remaining operational canneries, the company closed the Westminster plant permanently, and shut down the others for the season. In each fishing district the primary canneries were prepared to put up the greater part of the pack, their capacity supplemented by the secondary plants located nearby.[3] In contrast, B.C. Packers opened all fifteen of its operational plants for the expected large run in 1905, dramatically increasing the company's total packing capacity on the river and giving it more extensive coverage of the fishing grounds than any other canning company (Map 1). Only the five primary canneries packed in 1906. This pattern was repeated over the next twelve years.

By 1905 B.C. Packers had permanently closed fourteen of the twenty-nine canneries acquired on the Fraser River. Of the remainder, Imperial, Currie's, Brunswick #2, Terra Nova, and Ewen's had their packing capacity increased by the installation of additional canning lines and operated each year. During the big runs of 1909, 1913, and 1917 the company supplemented this capacity by operating its secondary plants, which were shut down during the intervening years. Following the season of 1917 all of these secondary plants were closed permanently.

The Northern Districts

The situation facing B.C. Packers in the northern districts seemed more straightforward than on the Fraser, for it involved fewer canneries. Many of the companies owning these canneries did not have plants on the Fraser, remaining somewhat removed from the chaos that characterized the industry on that river. Most were adequately capitalized, profitable operations. Pack sizes varied from year to year, dependent on the numbers of sockeye returning, but were not subject to wild fluctuations or cycles. None of the districts was as overdeveloped as the Fraser, although the increasing number of boats on both the Skeena River and Rivers Inlet was raising concerns about overfishing. The fishing grounds in each district were extensive, but were becoming crowded, and competition for fish between fishermen and canneries was keen. British Columbia Packers acquired eleven active canneries in the northern districts, and closed four of them by 1904.

In the deep waters of Rivers Inlet the fishing grounds covered the entire inlet, extending for about fifty kilometers. The sockeye run up the inlet to their spawning grounds in tributaries of Owikenyo Lake, which is connected to the inlet by the Wannock River. The fishing season officially opened on June 20, but fishing usually began around July 1 and continued until the middle of August. Confined to the waters inside the inlet, the fishery used the older, flat bottomed skiffs that companies rented to fishermen on a weekly or seasonal basis. Tides in the inlet were strong, rising sixteen to twenty feet, but did not

determine when fishing could take place, rather the weather appeared to have a major influence on a fisherman's success. The best fishing occurred at night, or on clear sunny days. On rainy days the fish sounded to the deep waters of the inlet and easily swam under the suspended gill-nets. During the opening weeks of the season the fishermen congregated at the mouth of the inlet to meet the returning salmon, with the heaviest fishing done in Schooner Passage (between Walbran Island and the mainland). Later, the fishermen moved towards the head of the inlet, Shotbolt Bay being the favoured fishing ground.[10]

B.C. Packers took over four canneries on Rivers Inlet: three, Wadhams, Vancouver, and Brunswick #3, located on the main body of the inlet just north of Schooner Passage; one, Wannock, located slightly closer to the head, where the inlet turns to the east. All were within eighteen kilometers of each other and two, Vancouver and Brunswick, were located side by side; all but Wannock had been recently built (Map 1). Despite its recent construction, the Vancouver Cannery had put up the smallest pack of any cannery working on the inlet in each year it operated, and was closed before the 1902 season opened. Its site and main cannery building were used for boat storage.[11] The Wannock plant had put up packs comparable to those of the Brunswick Cannery, but was described as being "badly situated and wretchedly arranged," and exposed to the strong winds that often swept up the inlet.[12] The cannery was closed following the 1902 season, its equipment moved to the Wadhams plant, its site used as a fish camp. By 1903 B.C. Packers had consolidated its

canning operations into the Brunswick and Wadhams plants. Both of these canneries had performed better than the other two plants over the preceding four years;[13] both were large and well situated, Wadhams at the south end of the inlet, Brunswick at the north; and neither required structural renovations to accommodate the addition of a second line.[14] After their expansion these two plants easily matched the pack previously put up in the four canneries (Table 2-5).

On the Skeena River, most of the early salmon fishery was centred around Port Essington; however, by 1901 the fishing grounds extended from about nineteen kilometers above Port Essington out into Chatham Sound, a distance of roughly seventy kilometers. During the early years, when flat bottomed skiffs were the only boats used, fishermen began the season working at

TABLE 2-5

PRODUCTION OF B.C. PACKERS' RIVERS INLET CANNERIES 1898-1904 (48 LB. CASES)

Cannery	1898	1899	1900	1901	1902	1903	1904
Wadhams	17,500	19,610	15,900	14,192	18,722	20,978	28,298
Brunswick	17,500	10,740	11,030	10,706	14,402	18,705	26,018
Wannock	13,500	10,867	12,450	9,876	9,680		
Vancouver	8,500	9,711	7,408	7,050			
Total	57,000	50,928	46,788	41,824	42,804	39,683	54,316

SOURCES: Canada, Parliament, Sessional Papers (Vols. 34-37), "Annual Report of the Department of Marine and Fisheries (Fisheries), (1899-1902); British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, (1902-1904).

the river's mouth, moving back upstream as the season progressed. By the mid 1890's though, overcrowding on the main river channel prompted some of the new canners to build on the south bank of the river estuary outside the mouth. Their location, although away from the established fishing grounds around Port Essington, was ideally situated to exploit fishing grounds outside the river mouth, undoubtedly hastening the adoption of round bottomed boats, in use by 1897.

The introduction of the round-bottomed Columbia River boat resulted in two separate fisheries developing on the Skeena, an outside and an inside fishery, each distinguished by cannery location and type of nets used. Sockeye return to the river *via* Chatham Sound, through Brown Passage and Edye Passage, and enter the main river channel by either Inverness Passage, De Horsey Passage, or Marcus Passage.[15] Because fishermen working these waters had the first opportunity to catch the sockeye, all canneries had their fishermen work the outside approaches for the first few weeks of the season; the boats meeting the fish in Chatham Sound as far out as the Rachael Islands (Map 2). During this time the canneries located up-river were at a disadvantage, having to tow their fishing boats and transport the catch greater distances than canneries located around the river mouth. After the first few weeks, when the numbers of returning fish increased, these up-river canneries pulled their fishermen back into the river channel and boats were spread over the length of the fishing grounds. Fishermen working for canneries located outside the river mouth continued concentrating their effort on

the deep water approaches, and used deeper nets. Up-river canneries had their fishermen work the much shallower river channel, where shallow nets were used to trap the salmon on sand bars as the fish moved upstream. Larger canning companies, like the Anglo-British Columbia Packers, operated two canneries on the river to exploit both fisheries.[16]

B.C. Packers acquired three of the eleven canneries that operated on the Skeena in 1901: Standard, Cunningham's, and Balmoral (Map 2). Each of these was old--all had been built before 1890--and their age coupled with small size prevented any of them from being expanded to a multi-line plant; the company was forced to build a new plant. The Standard site--described as being "very badly arranged, . . . [and] fully twenty five miles away from the fishing grounds, [the sockeye did not come up through Telegraph Passage] is in a badly exposed place, and has no beach or other accommodations for boats,"--was clearly not suitable; Cunningham's, located in the town of Port Essington, had a good location and ready access to the town's labour supply, but barely enough land. Balmoral, located across the Ecstall River from Port Essington, had land, water, a suitable foreshore, and was chosen as the site to construct a new cannery. Although removed from the labour supply of Port Essington, the 1902 Cannery Report stated "This drawback, however, may be fully counterbalanced by the greater sobriety that would be there as compared to Essington, and also by the store business that could be obtained."[17] Before the 1903 season a new two line cannery was built, which took the name of

its predecessor, new outbuildings and boardwalks were erected, and the old cannery building was repaired and converted to a net house. Originally estimated to cost $18,000.00, $50,401.90 was spent on the project. Small improvements were also made to the Cunningham's plant.[18] The Standard Cannery was closed following the 1903 season. With both its plants located up river B.C. Packers was disadvantaged relative to the outside fishery. To offset this a fishing camp was established about one kilometre south of the Standard site, where shoreline characteristics were more satisfactory.

B.C. Packers acquired four other canneries in the 1902 merger, three of them--China Hat, Lowe Inlet, and Bella Coola--located in the outlying districts between Rivers Inlet and the Skeena River (Map 2), the fourth--Alert Bay--located on Cormorant Island, east of Vancouver Island (Map 1). The Company closed the China Hat plant, mainly because the site was unproven as a good canning location. Each of the others had been constructed to exploit small, nearby sockeye runs, and remained operating. Beach seines, used on the Nimpkish River, provided the Alert Bay Cannery with the majority of its fish. Being opposite the mouths of a number of small inlets that penetrated the mainland, the cannery was also well located to capitalize on runs of pinks and cohos when markets for these fish began to open up. The Bella Coola Cannery was built at the head of North Bentinck Arm to harvest the sockeye run of the Bella Coola River. The fishing grounds of the cannery covered the entire waters of the Arm, from the river mouth to Labouchere Channel,

and the cannery was also ideally located to exploit the pink and coho runs of the Necleetsconay River, which emptied into North Bentinck Arm about 1.5 kilometers west of the Bella Coola River. In an unsuccessful attempt to monopolize fishing in the area, B.C. Packers applied for the foreshore rights to every one of the few locations where a cannery could be built. Lowe Inlet, situated off Grenville Channel, relied on beach seines to supply most of its sockeye, and the Cannery Report suggested that a judgment on the advantages of this location be reserved until the government permitted the use of purse-seines. Of the three outlying canneries only the Bella Coola plant required any major work (B.C. Packers completely rebuilt the plant, adding a large number of outbuildings), and all three were kept operating as single line plants, with only minor changes being made to their existing equipment.[19]

Management Strategies Following the 1902 Merger

As general manager of British Columbia Packers, Henry Doyle's task was to reorganize the production of thirty-three salmon canning companies into one: profitably. To accomplish this he was limited, for the most part, to working with the properties that were acquired in the merger, many of which were ill-equipped, unprofitable operations, some built on sites unsuited for successful salmon canning. The cost of carrying out the merger and the necessity of providing adequate working capital for the new company prohibited Doyle from clearing the slate and starting over; old canneries could not be abandoned

and replaced with large, multi-line, plants, optimally located in the fishing districts, and equipped with the most modern, efficient, high-speed machinery--similar to those operating on Puget Sound or in Alaska. Instead, his rationalization program depended on making the best use of existing buildings and machinery, and on consolidating the company's packing capacity in those canneries that were advantageously located, structurally sound, and large enough to accommodate a second canning line. The equipment for these additional lines would come from those canneries that were closed. Only in areas where no existing plant was suitable for expansion would a new cannery be built. This policy, initiated at a time when the British Columbia salmon canning industry was in financial difficulty, kept the cost of reorganization to a minimum; the principal strategy underlying its implementation was to maintain a broad coverage of the fishing grounds, and by doing so give the new company operational benefits unattainable by any of its competitors.

By 1900 a combination of smaller fishing grounds comprised the vast area of the Fraser River fishery. The majority of fishing took place in the area around Steveston, both in the main channel of the river and out into the Gulf, but intensive fishing also occurred on Canoe Pass, the North Arm, and the upper reaches of the Fraser, towards and beyond New Westminster. Fishing in each district was carried on independently of the others and most fishermen concentrated their fishing effort in one of the districts.[29] The expanse of the fishing grounds

forced all canners to depend on their tenderboats to a greater or lesser degree; however, the precise cost of tendering fish, and the distances raw fish could be economically transported are unknown. What is known is that any cannery having to tender its fish for greater distances than its competitors suffered a cost disadvantage.[21] Higher tendering costs could not be recovered by reductions in other operating costs, or by passing the cost on to the consumer in the form of higher prices. Working agreements between member companies of the Fraser River Canners Association, which despite its name represented all salmon canners in the province, had, at least on paper, eliminated much of the cost competition within the industry. Wages paid cannery workers and prices paid fishermen were set in advance of the season opening. The Association negotiated with coastal shipping lines and trans-oceanic carriers for uniform freight rates for its members. And by selling the British Columbia pack through a marketing committee in London, all canners received approximately the same price for each case of salmon of equal quality.[22] Violation of these agreements certainly occurred, but when they did, operating costs were increased, not lowered.[23] To keep tendering costs as low as possible, canners continued to build new plants as close as possible to the fishing grounds.

There was one notable exception. After the Dominion government permitted the use of fish traps on south-western Vancouver Island, canning companies operating these traps regularly barged the trap-caught salmon to their Fraser River

canneries for packing, a distance of roughly 165 kilometers (Map 1). Steam tugs pulling scows and capable of making ten knots could make this journey in approximately ten hours. But the Dominion fisheries inspector did not expect the carrying of raw fish to the mainland to continue:

> I have no doubt that all the companies operating traps on the west coast of Vancouver Island will erect canneries at or near Victoria, as taking the salmon from the traps to the Fraser river canneries by tugs and scows is expensive, they are apt also to deteriorate in quality if taken a long distance.[24]

In spite of this concern over cost and perishability, J.H. Todd and Sons was the only major canning company to build a new cannery in the Victoria area, opening their Empire plant at Esquimalt in 1905. The other large companies continued barging their salmon to the Fraser, the extra cost of doing so probably being outweighed by the combined savings of not having to build a new plant near Victoria, and being able to operate their Fraser River plants more efficiently because the increased volume of fish allowed canning lines to run closer to their rated capacity.

The expanse of the Fraser River fishery, and the greater distances being covered by tenderboats, also increased concern about the possibilities of putting up tainted fish. Most of the established canners were aware that the industry's economic well-being depended on maintaining high standards of quality.[25] Almost all of the British Columbia salmon pack was sold in export markets, but higher production costs in the province forced the province's canners to ask higher prices for their

fish than their American counterparts. To justify these prices industry representatives worked hard establishing British Columbian canned salmon as a premium quality product in the minds of British consumers. Reports of tainted fish tarnished this reputation for quality, and even though reclamations for bad packs would be made against the canner responsible, the industry as a whole suffered consequences; often the remainder of the season's pack would be hard to clear, forcing a reduction in the selling price.

Whenever tainted packs were discovered, the cause was most often attributed to tenderboats not delivering their salmon to the cannery quickly enough after the fish were caught:

> There is no question in my mind that the cause of this soft fish is, to a great extent, the result of the managers' carelessness in not insisting on every boat reporting and delivering its fish every twenty-four hours . . . and I have impressed upon the District Managers the necessity for having this rule enforced.[26]

But, like the economic margins of tendering, the length of time that raw salmon could be safely kept before canning is unknown. A Dominion government report published in 1906 gives the impression that the fish were canned as soon as possible after they were caught;[27] yet Cobb's handbook for salmon canners, published in 1919, states that

> Most cannerymen agree that it is necessary to allow the fish to lie from ten to twenty-four hours after being taken from the water before being canned, claiming that if some of its moisture has not been allowed to evaporate a pound of meat cannot be packed into the can. While chinook [spring], coho, red [sockeye], and, at times chum salmon may possibly be kept with safety and profit for twenty-four hours, this can rarely ever be done with the humpback [pink] salmon, which soon softens and spoils after being removed from the water.[28]

Another source, from the mid-1930's, claims that if the salmon had not been sitting in fish scows for at least eighteen to twenty-four hours, they would be left sitting on the cannery floor until the appropriate time had elapsed.[29] Given these time spans, and the fact that salmon were being barged from the south-western corner Vancouver Island to the Fraser River, cannery tenderboats should easily have been able cover the Fraser River fishing grounds; however, intervening factors made it difficult, if not impossible, to determine how long a catch had been out of the water before being delivered to the cannery. Sometimes the tender might take too long a route, or stop too many times to collect fish on its way back to the cannery; sometimes the fishermen were delinquent in delivering their catch to the collection scow or cannery, holding the fish more than twenty-four hours themselves; sometimes one injudicious action might compound the other. Weather and temperature conditions also affected the length of time salmon could be kept safely. On a July or August day, with the salmon lying exposed to the sun, the perishability of the fish increased dramatically, narrowing the margins of safety. In an attempt to address this situation Alexander Ewen, an original partner in the province's first commercial salmon cannery and one of the most respected canners on the river, gave the following notice of motion to a meeting of the Fraser River Canners Association prior to the 1903 canning season:

> That the Members of this Association during the sockeye season of 1903 shall not employ boats or steamers to gather

> or collect Salmon from fishing boats in the Gulf of Georgia or outside the Sand Heads.
>
> If it shall be found necessary to establish camps outside the Sand Heads at which to receive fish, the steamers or boats employed to carry fish from the receiving stations shall not gather or receive fish from fishing boats while running between the cannery and the fishing camp or receiving stations established outside the Sand Heads.
>
> That the members of this association shall insist that men fishing for them, deliver to their cannery or receiving station at least once in every twenty-four hours.[30]

From the point of view of the salmon canners, the areal expansion of the Fraser River fishing grounds was a double-edged sword. Initially, having fishermen in each of the fishing districts gave canners access to more fish, for the salmon did not run to all parts of the river in equal numbers; but eventually the practice became necessary to maintain a share of the total catch. This led directly to higher production costs resulting from both the increased cost of tendering, and from the costs associated with the greater chances of putting up tainted fish.

Operating a two-line cannery in each of the fishing districts on on the Fraser enabled B.C. Packers to address each of these problems. Each of the company's main canneries received its fish from within its own district. The number of boats B.C. Packers fished in each area, and the size of the pack each cannery prepared for, correspond with where the largest catches were made and where the fishing effort was most concentrated. In 1903 the company fished 449 of its 1401 boats in the Steveston district on the main river, 369 in Canoe Pass, 277 around New Westminster, and 306 on the North Arm; in 1906 the Imperial Cannery prepared for a pack of 27,000 cases,

Currie's 18,000, Brunswick 20,000, Ewen's 18,000, and Terra Nova 17,000.[31] Operating in this manner the company lowered its tendering costs by minimizing the distance that company tenders had to transport raw salmon, and because no other canning company had the ability to operate in each district, B.C. Packers gained an economic advantage over its competitors. Reducing the distance between the fishing grounds and cannery also lessened the chance of packing tainted fish. Because each cannery drew from a smaller, well defined area, tenderboats easily shuttled back and forth from the collection scows to the various canneries. The advantage enjoyed by B.C. Packers in this respect perhaps underlies Alexander Ewen's notice of motion mentioned above. Ewen was the president of B.C. Packers, and had the canners association accepted his proposals, compliance would have affected the operations of other canning companies to a far greater extent than B.C. Packers. The tenderboats of other companies would be forced to return to the cannery more frequently, which increased the amount of non-productive time associated with having the tender travel back and forth to the fishing grounds, and would reduce the number of collections the tender could make per journey. Both would result in higher tendering costs. B.C. Packers on the other hand, with canneries located in each fishing district, would still have access to a large amount of fish without altering its system of tendering. Significantly, no mention of the motion can be found in the minutes of later meetings.

A two-line cannery in each of the fishing districts also allowed B.C. Packers to adjust easily to the changing nature of salmon canning on the river brought about by the company's formation. The sockeye ran in spurts to the Fraser; great numbers of fish would arrive at the river mouth over a very short time and canneries often put up the majority of the season's pack in only a few days.[32] But prior to 1902 these fish were divided amongst the large number of canning companies working on the river, limiting the number of salmon received by any one cannery. As a consequence canneries on the Fraser were much smaller than those in nearby Washington State[33] (in 1900 the average pack put up in Puget Sound canneries was over 3.5 times greater than that put up on the Fraser River),[34] yet only during the peak of the big runs on the Fraser were these smaller, single line plants incapable of handling the deliveries of salmon. The merger of 1902 eliminated much of this competition for fish and reduced the number of ways the catch was divided. Faster two-line canneries became feasible, and perhaps necessary, if the runs were to be fully exploited. By 1905 two other companies besides B.C. Packers had established multi-line canneries on the Fraser: Anglo-British Columbia installed a second line in its Phoenix plant; and Malcolm, Cannon and Company made each of its three plants, Gulf of Georgia, Scottish Canadian, and English Bay, two-line canneries. Establishing multi-line plants was the cornerstone of Doyle's amalgamation proposal, for they allowed the consolidation of packing capacity into a fewer number of canneries; taking over

so many canneries on the river should have enabled B.C. Packers to establish their two-line plants easily, and relatively inexpensively, compared to the other companies.

The success of two line canneries in British Columbia was tied to a new piece of canning line equipment, the automatic butchering machine, being introduced to the industry at the same time Doyle took control of his new company. Inventors had been working on how to mechanize this part of the canning process for years. The incentive for a mechanical means of cleaning and butchering salmon was certainly present: all canners, from California to Alaska, were afflicted with labour shortages and higher labour costs, especially at the butchering tables, where workers were demanding more money in exchange for their quickness, dexterity, and skill.[88] Eight different fish-cleaning machines were patented between 1901 and 1904, and a number of these operated on a trial basis in American canneries during 1901 and 1902. Henry Doyle was undoubtedly aware of automatic butchering machines when he drew up his consolidation plans for B.C. Packers, and by the time B.C. Packers was ready to open its two-line plants Doyle was familiar with their existence and potential capabilities. B.C. Packers became the first British Columbia canning company to use one of these automatic butchers, installing a Kellington machine in one of its plants prior to the 1903 season. This machine was not the famous E.A. Smith "Iron Chink" that soon became the industry standard, and it did not completely eliminate the need for some manual butchering (to remove the salmon's head and tail), but

even one of these early machines kept two canning lines supplied with split, gutted, and cleaned salmon, with a minimum of human assistance. B.C. Packers' experience with the Kellingtons must have been favourable because the company ordered three more to be installed in their plants in preparation for the big year of 1905.[36]

Even though B.C. Packers had closed most of the twenty-nine Fraser River plants taken over in 1902, the company could have probably closed even more. Daily cannery reports show that on many days the number of fish delivered to the canneries hardly warranted keeping the plants open.[37] On the other hand, keeping a two-line plant in each fishing district gave B.C. Packers a degree of operational flexibility unattainable by any other canning company on the river. During the off years each cannery easily put up all the fish caught in the district, and cannery inspection reports show that when poor runs were expected the company minimized unused capacity by shutting down one of the canning lines in each plant, and two lines in Imperial.[38] Should conditions change, the butchering machines allowed for these lines to be reactivated quickly, without the need of much additional labour. During the years of the big run (1905, 1909, 1913, and 1917) both lines were used, their capacity supplemented by operating one or more of its smaller, less mechanized, single line plants. Operating five strategically located canneries on the river also enabled B.C. Packers to transfer fish from one cannery to another should mechanical or labour trouble disrupt production in one plant.

As the season progressed, and the number of salmon returning to the river declined, the company closed the Brunswick #2, Currie-McWilliams, and Ewen plants, leaving Imperial on the main channel and Terra Nova on the North Arm open to put up the late running fish.[39]

The factors that influenced B.C. Packers actions on the Fraser River were also present in the northern canning districts of Rivers Inlet and the Skeena River. Although the scale of cannery closures on these waters was smaller than on the Fraser, in both districts the company consolidated its canning capacity into a fewer number of canneries. As G.I. Wilson testified to the 1905 Royal Commission,

> You can run one cannery of big capacity cheaper than two of lesser capacity. Your insurance and your watchmen, a great many such things in connection with the cannery, make it cheaper. That is the reason we closed up the canneries . . ..[40]

For each cannery closed following the consolidation, valuators had estimated savings of at least $7,840 per year in operating expenses, exclusive of management salaries and cannery contract labour.[41] As on the Fraser River the company did not randomly close plants. On Rivers Inlet the operation of the Brunswick and Wadhams plants ensured that B.C. Packers maintained good coverage of the fishing grounds, although with fishing restricted to the waters of the inlet tendering costs were not as significant a factor as on the Fraser. But on the Skeena, having both its canneries located up-river prevented the company from taking full advantage of the fishery carried on outside the river mouth. Operating at least two canneries in each district

gave B.C. Packers an edge over their competitors, e.g., in 1905 the Wadhams Cannery packed all the one-half and one pound flat cans on Rivers Inlet, while Brunswick packed all one pound talls. This eliminated the need to halt production to change can styles. Should fire destroy one of the canneries, a common industrial accident, all production in that canning district was not lost for the season.

Two additional factors influenced the decisions B.C. Packers made regarding their operations on Rivers Inlet and the Skeena River. First, in 1903 canners operating plants in these districts voluntarily agreed on a boat-rating system, limiting the number of fishing boats each cannery put out. Second, because canners in the northern districts continued operating predominantly manual canning lines, each season they faced the prospect of labour shortages. These two factors became explicitly linked.

The establishment of a boat-rating grew out of the industry's concern that too many fishing boats were working provincial waters.[43] Canners owned practically all of the fishing boats and gill-nets used in the northern waters, and skill of the individual fisherman aside, the number of boats a cannery outfitted largely determined its share of the total district catch. As the number of canneries in each district increased, so too did the number of fishing boats, and competition between a growing number of canneries for supplies of salmon forced canners to expand the size of their fishing fleets to maintain their share of fish. Responsible salmon

canners were aware that this not only drove up the cost of acquiring fish, but placed increasing pressure on the fish stocks, depleting the resource base and threatening the industry's future. Once started, though, this cycle of fleet expansion was difficult to reverse, despite recognition of its harmful consequences.[43] Should one cannery unilaterally reduce the number of its boats, the result would be a reduction in its share of the catch; this share would be further reduced if other plants continued increasing the number of boats they put out. Until all cannery operators in a district agreed to limit the size of their fishing fleets, the total number of boats would continue to climb. The boat-rating system adopted in 1903 represented that agreement. It set a limit on the total number of boats to be fished in each district, and assigned each cannery a rating, or proportion, of that number.

The minutes of the Fraser River Canners Association contain no mention of how canners arrived at the boat-ratings assigned in the 1903 season. When the Dominion Boat-Rating Commission of 1910 attempted to establish ratings, after the canner's failed to reach a voluntary arrangement, the commissioners found no consensus amongst canners regarding what criteria should be considered when setting a cannery's rating. Some canners argued that a plant's packing capacity should determine the number of boats permitted, and that this capacity be calculated from a cannery's pack record, its floor space, and the equipment in use. Others argued that location, capital investment, and cooking capacity should be the governing

criteria."[44] Regardless of this lack of unanimity before the government commissioners, canners must have given significant emphasis to a cannery's past performance in determining the ratings for 1903. Plants consistently putting up larger packs undoubtedly had a greater packing capacity, required greater supplies of salmon to achieve adequate levels of efficiency, and were assigned a larger rating. Tables 2-6 and 2-7 give the ratings agreed to for the 1903 and 1904 seasons. As Table 2-6 shows, B.C. Packers was allowed to transfer the ratings for its Wannock and Vancouver canneries to the Wadhams and Brunswick plants. This enabled the company to fish enough boats to supply the two lines in each plant with enough fish. As Tables 2-8 and 2-9 illustrate, the percentage of the total pack put up by each cannery closely matches the percentage of the total boats fished by the cannery. This relationship is closer for the Rivers Inlet district than the Skeena, perhaps because of the fewer number of canneries involved, and the nature of fishing. On the Skeena River the total number of boats was split between a larger number of canneries, and there were two separate fisheries, each demanding different skills.

The number of boats a cannery outfitted also affected its manager's ability to attract enough workers to his plant. Utilizing manual rather than more mechanized canning processes left canners exposed to the possibility of labour shortages, particularly on Rivers Inlet, where no nearby settlements existed. Most of the work force were Indians, the men working primarily as fishermen, the women and children working in the

TABLE 2-6

BOAT-RATING FOR RIVERS INLET 1903 AND 1904

Cannery	Mutually Agreed Boat-rating*	Percentage of Total Boats
Wadhams	88	19.2
Brunswick	69	15.1
Wannock	57	12.4
Vancouver	54	11.8
Good Hope	76	16.6
Rivers Inlet	114	24.9
Total	458	100.0

SOURCE: "Working Agreement for Rivers Inlet Canneries for Season of 1903," Fraser River Canners Association, Minute Book 1, between pages 232 & 234, International Pacific Salmon Fisheries Commission, University of British Columbia Library, Special Collections Division, Vancouver, British Columbia.

*The Canners' Mutual Agreement allowed B.C. Packers to transfer the ratings for the Wannock Cannery to Wadhams, and the Vancouver Cannery to Brunswick. This gave Wadhams 145 boats (31.6%) and Brunswick 123 (26.9%).

canneries. In 1902 the majority of fishermen working on Rivers Inlet were Indians, about one-quarter were Japanese, and there were only a few whites.[45] As important as the Indian fishermen were to the canners, they were not as important as their families, which accompanied the men to the canneries each season. Canners remarked that they could replace the Indian fishermen with Japanese, who were preferred because of their greater productivity: "on the average [Japanese fishermen] deliver twice as many sockeyes as the whites, and nearly three

TABLE 2-7

SKEENA RIVER BOAT-RATING, 1903 AND 1904

Cannery	Boat-rating	Percentage of Total Boats
Balmoral	125	16.7
Cunningham's	70	9.3
Oceanic	100	13.3
British America	90	12.0
North Pacific	81	10.8
Claxton	76	10.1
Inverness	71	9.5
Carlisle	67	8.9
Skeena River Commercial	38	5.1
Cassiar	32	4.3
Total	750	100.0

SOURCE: Canada, Dominion-British Columbia Boat-Rating Commission, 1910: Report and Recommendations (Ottawa: n.p., n.d.).

times as many as the Indians,"[46] but the families of the Indian fishermen were indispensable, for they supplied the labour necessary to keep the canneries operating. To secure this labour the cannery managers offered Indian men fishing contracts to attract them and their families to the canneries for the summer: "The desirability of a particular Indian is measured by the number of women his household will produce for the canneries as fish cleaners and can fillers."[47] Managers needed a certain

TABLE 2-8

PERCENTAGE OF TOTAL PACK PUT UP BY INDIVIDUAL CANNERIES ON RIVERS INLET IN 1903 AND 1904

Cannery	1903 Pack	Percentage of 1903 Pack	1904 Pack	Percentage of 1904 Pack
Rivers Inlet	17,192	24.8	21,233	22.5
Good Hope	12,515	18.0	18,743	19.9
Brunswick	18,705	27.0	26,018	27.6
Wadhams	20,978	30.2	28,298	30.0
Total	69,390	100.0	94,292	100.0

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, (1903-1904).

number of boats to ensure an adequate labour force, and this had to be considered when establishing boat-ratings. The 1910 Boat-rating Commission reported

> The majority of the cannery managers on the Skeena claim that the total number of boats licensed should not exceed 850, that this number can be permitted with safety, but that 850 is essential to ensure getting the required number of women to clean and pack the fish.[48]

Despite the possibility of labour shortages, canners retained manual canning lines in the north because they were not only cheaper, but were ideally suited to fishing conditions there. The sockeye runs were more evenly spread out over the season, and manual lines were able to handle all of the fish caught in a single day. They were also more flexible. Should deliveries of fish demand it, the speed of the line was quickly changed by either increasing or decreasing the number of workers

TABLE 2-9

PERCENTAGE OF TOTAL PACK PUT UP BY INDIVIDUAL CANNERIES ON THE SKEENA RIVER IN 1903 AND 1904

Cannery	1903 Pack	Percentage of 1903 Pack	1904 Pack	Percentage of 1904 Pack
Balmoral	10,873	11.0	20,173	13.0
Cunninghams	8,440	8.6	11,940	7.7
Standard	3,510	3.6		
B. America & N. Pacific*	20,646	20.9	30,840	19.9
Inverness	9,687	9.8	15,554	10.0
Oceanic	13,941	14.1	21,541	13.9
Claxton	12,473	12.6	17,924	11.6
Carlisle	6,483	6.6	10,700	6.9
S.R.C.**	9,135	9.3	10,813	7.0
Cassiar	3,481	3.5	7,229	4.7
Alexandria			4,335	2.8
Ladysmith			3,820	2.5
Total	98,669	100.0	154,869	100.0

SOURCE: British Columbia, Department of Fisheries Report of the Commissioner of Fisheries (1902-1903).

NOTE: Packed in 48 lb. cases.

*Both the British America and North Pacific canneries were owned by the Anglo-British Columbia Packing Company. The fisheries report only gives the combined pack of these two plants.

**S.R.C. stands for the Skeena River Commercial Cannery, located in Port Essington. In 1902 this plant operated as Herman's, and the pack for 1902 is listed in the report under this name.

on the line, having the workers work faster or slower, or by altering the length of the working day. Conversely, the speed of a mechanized line, although variable, was relatively inflexible, demanding continuous supplies of raw fish to be fully utilized. Seldom could this demand be met by the smaller sockeye runs of the northern waters. Only when canners began targeting the lesser species of salmon, increasing both the numbers of fish that were delivered to the cannery at one time, and the length of the canning season, did mechanized plants north of the Fraser River become practical.

Given these conditions, canners viewed attracting enough workers to the canneries as a collective problem, and worked together to attract as many workers as possible to the canning districts. As early as 1903 canners were providing Japanese and white workers with one-way transportation to the inlet's canneries, and two-way transportation for Indians; on the Skeena the same terms existed for all but the Indians, who received no transportation allowance.[49] To prevent the raiding of fishermen, the canners' association drew up standardized fishing contracts, which set down the rules to be followed by fishermen, and how the boats and nets would be distributed for the season.

'FISHING CONTRACT'

> I _____
> hereby agree with _____
> Manager of the _____ Cannery, Skeena River, to fish for the above cannery for the season of 1903, or such part thereof as may be required by the manager above named, and undertake to deliver all salmon at the cannery above named, or into a scow or boat belonging to the above named cannery as may be desired by the manager thereof . . .. I further agree to provide and pay the wages of one boat-puller

> without other consideration. It is understood and agreed that I shall be provided by the above cannery, free of charge, with one boat and net and sufficient advance to pay for license, and that I return said boat and net to the above named cannery at the close of the season, or when called upon to do so.[50]

Sometimes, as in the above contact for 1903, fishing gear was given to Indian fishermen free of charge to induce them to come to the canneries, but if the fishing gear was rented out, canners kept the cost as low as possible. During the 1900's this cost remained at $2.00 a week for a round-bottomed Columbia River boat, and $1.00 a week for a flat-bottomed skiff.[51] The canners preferred to carry the extra cost of retaining ownership of all the fishing gear used in northern waters because it gave them a means to attract workers to their plants, as well as a means to control fishermen and enforce the fishing contract.[52] Later, when the fishermen attempted to gain a limited degree of independence by using their own nets, the cannery operators passed a resolution agreeing not to engage any fishermen for the season who were owners of their own gear.[53] As on the Fraser, competition between canneries led to these agreements being broken. To increase their supply of fish, cannery managers encouraged fishermen who had signed with other companies to break their contracts. Also, if labour shortages were expected, managers offered bonuses to Indian fishermen, "Some of them gave as high as $25 and a pair of rubber boots to get Indians from other canneries."[54]

When B.C. Packers took over the canneries operating in these two districts it also inherited their assigned

boat-ratings. To keep these ratings the company had to maintain the packing capacity on which the ratings were based, or suffer a reduction in the number of boats it was allowed to fish, and the consequences that fewer boats would entail. But continued operation of all its plants, particularly on Rivers Inlet where all were located so close to each other, would have been counter to the purpose of the company's formation. By expanding the capacity of two canneries and closing down the remainder, B.C. Packers made the most of this situation: the company was allowed to fish the boats of four canneries while only operating two, and at the same time cut overhead costs by closing the excess plants. On the Skeena, the closure of the poorly situated Standard Cannery and the expansion of the Balmoral plant represented the same principles.

Impacts of the 1902 Merger

Participation in the British Columbia Packers Association amalgamation failed to meet Henry Doyle's optimistic expectations. He was unable to convince most of the province's larger canning companies to join the merger; instead, his new company was formed out of the financial casualties of the 1901 season. Despite this, the company's actions following the merger were those that Doyle proposed in his 1901 Report on the British Columbia Salmon Industry. By 1903 B.C. Packers had begun consolidating its operations in each district by closing a proportion of the canneries taken over while enlarging the capacity of those kept operating. This rationalization plan

eliminated much of the province's excess canning capacity, and benefitted both the company and the salmon canning industry as a whole.

Consolidating canning capacity into fewer, but larger, multiple line canneries allowed B.C. Packers to realize some economies of scale at the plant level. Although evidence is limited, comparison of the pack size and cost of pack figures for 1905 suggests that, with the notable exception of the Imperial plant, the company's two-line canneries on the Fraser put up much larger packs than the smaller, single-line plants, and did so at a lower cost per case (Table 2-10). But these economies were small. Many factors combined to set definite limits on the economies attainable in the canning process. One of the more restrictive of these was the impossibility of standardizing cannery management techniques. Managers were responsible for a diversity of duties that ranged from organizing plant production to acting as the settlement's administrator. His ability to handle these duties had almost as much effect on the cannery's performance as the modernness and efficiency of its machinery.[55] Unskilful management appears to have been at the heart of the Imperial's problems. Doyle noted that William Barker, who had replaced Doyle as general manager of B.C. Packers in October of 1904, was aware of the cannery's troubles and was

> disgusted over the way things are going at the Imperial; that there is nothing economical about its present management; their fuel bill is very high in proportion to other places; their work is the poorest he ever saw and everything seems to go wrong.[56]

TABLE 2-10

B.C.P.A. COST OF FRASER RIVER SOCKEYE PACK FOR 1905*

Cannery	1/2 lb. Flats	1 lb. Flats	1 lb. Talls	Number of Cases
Brunswick (FR)**	$3.42	$2.70		36,784
Anglo-American	$3.53		$2.69	14,254
Ewen**	$3.60	$2.86		30,119
Terra Nova**	$3.60	$2.88		31,120
Canadian Pacific	$3.70	$2.94		16,977
Currie's**	$3.71	$2.98		26,574
Dinsmore	$3.75			12,340
Imperial**	$3.82	$3.21	$2.99	62,081
Albion	$3.84	$3.07		18,247
Celtic	$3.85	$3.06		14,776
Atlas	$3.90	$3.09		13,640
Cleeve	$3.95	$3.12		15,230
Acme		$3.13	$2.92	14,257

SOURCE: "B.C.P.A. Cost of Sockeye Pack 1905," Henry Doyle Papers, Box 4, Book 1, p. 256; and Henry Doyle Papers, Box 4, Book 19, University of British Columbia Library, Special Collections Division, Vancouver, British Columbia.

*Exclusive of head office expenses. The cost of packs put up by the Colonial and Pacific Coast canneries, which also operated in 1905, are not given. Their packs were 13,025 cases and 19,459 cases respectively.

**Denotes a multi-line cannery.

Cost of pack figures for 1907 show that many of these problems must have been solved; the cost of packing all sized cans at Imperial was the lowest of all the company's Fraser River plants (Table 2-11). These figures also highlight the lower production costs in the less technologically advanced northern canneries.

Even though B.C. Packers was able to realize small economies of scale at the plant level, the elimination of diseconomies at the industry level appears to have been equally important. All of the canners operating on the Fraser River appreciated that the total district pack could be put up more economically in a fewer number of plants. By absorbing most of the small, inadequately funded canning companies, and by closing many of their plants, B.C. Packers eliminated much of the industry's excess packing capacity, and by doing so reduced competition between canners for fish. This played a large part in helping the industry out of its 1901 crisis.

B.C. Packers paid a high price to accomplish this. Although cannery closures reduced operating expenses, the cost of consolidating the company's operations turned out to be much higher than expected. The executive committee, working from recommendations and estimates supplied by the various district managers, budgeted $96,000 for the construction and improvement of company plants in preparation for the 1903 canning season.[37] The total cost of these changes, even after plans for the Fraser River district had been cut back, was $140,936. Building the three new canneries accounts for the bulk of the money spent, and all of the cost overruns: the Balmoral, estimated at

TABLE 2-11

B.C.P.A. COST OF SOCKEYE PACK FOR 1907*

Cannery	1/2 lb. Flats	1 lb. Flats	1 lb. Talls
Terra Nova	6.31	5.36	
Currie's		5.66	
Brunswick (FR)	6.62		
Imperial	6.07	5.18	5.10
Lowe Inlet			3.67
Wadhams (RI)	4.95	3.76	3.92
Alert Bay			3.53

SOURCE: Henry Doyle Papers, Box 4, Book 18, University of British Columbia Library, Special Collections Division, Vancouver, British Columbia.

*Exclusive of head office expenses.

$15,000, cost $50,401.90; the cost of Bella Coola was $17,400 instead of $5,000; and the company spent $46,812.70 building the four line Imperial Cannery, almost $19,000 over the $28,000 estimate.[58] The financial problems that these extra expenditures created were sharpened by unexpectedly poor salmon runs in 1902, 1903, and 1904. The packs from each of the provincial canning districts fell far below expectations in all three years. The situation on the Fraser was critical: B.C. Packers made preparations to pack 326,400 cases in 1902, but packed only 166,867; in 1904 only 33 percent of the 161,571 cases prepared for were filled.[59]

Another consequence of eliminating the industry's excess canning capacity was a reduction in B.C. Packers' share of the total pack. Tables 2-12 and 2-13 show the steady decline of the company's percentage of pack after 1902. The closure of canneries was responsible for the drop in the Fraser River district. B.C. Packers owned seventeen of the eighteen plants closed between 1902 and 1906. In the northern districts, plant closures, coupled with other companies building new canneries, led to the decline (Table 2-14). Notwithstanding this decline in overall percentage, Tables 2-12 and 2-13 also show that the increased efficiency of B.C. Packers' plants allowed the company's percentage of pack to exceed its percentage of the total number of canneries that operated.

Unfortunately for Henry Doyle, increased plant efficiency was not enough to satisfy the company's board of directors. The directors, most of whom were unfamiliar with the business of salmon canning, had high expectations of the new company. The high cost of plant consolidations, undertaken during a series unanticipated poor years, resulted in unexpectedly low operating profits for the first three years following the merger.[60] The directors held Doyle responsible for the company's poor showing, and accused him of extravagant and impractical management. Doyle refuted these charges. He argued that he alone could not be held responsible for the excessive construction costs. All of the changes made to the company's plants had been proposed, estimated, and supervised by the cannery managers themselves, and had been approved by the executive committee. Doyle also

TABLE 2-12

PERCENTAGE OF THE TOTAL PROVINCIAL PACK
PUT UP BY B.C. PACKERS' CANNERIES

Year	Tot. Pack of B.C. Packers	Provincial Total	B.C. Packers' Percentage of Pack	B.C. Packers' Percentage of Canneries
1902	273,782	625,982	43.7	45.1
1903	192,056	473,674	40.5	37.5
1904	164,696	465,894	35.4	32.1
1905	435,501	1,167,460	37.3	32.8
1906	159,547	629,460	25.3	20.0

SOURCE: Canada, Parliament, Sessional Papers (Vols. 38-42), "Annual Report of the Department of Marine and Fisheries (Fisheries)," (1902-1906); British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, (1902-1906).

NOTE: Packed in 48 lb. cases.

argued that the cost overruns were not as high as they appeared, and accused certain members of the executive committee of using improper accounting practices to inflate the cost of plant renovations in order to cover up operating losses and shift the blame for the company's low profits onto himself.[61] Doyle concluded his defence by stating that under his "impractical" management the company's canneries operated "in a state of efficiency which they never equalled in the past," which is what he had promised in the literature promoting the merger. Poor fishing had prevented "an opportunity of demonstrating in practice our ability to cut down the cost of packing operations to the extent that can be accomplished."[62] Notwithstanding the

TABLE 2-13

PERCENTAGE OF DISTRICT PACK PUT UP BY B.C. PACKERS' CANNERIES IN THE FRASER RIVER, SKEENA RIVER, AND RIVERS INLET DISTRICTS, 1902-1906

Year	Tot. Pack of B.C. Packers	District Total	B.C. Packers' Percentage of Pack	B.C. Packers' Percentage of Canneries
Fraser River				
1902	166,867	327,095	51.0	52.4
1903	106,079	237,125	44.7	44.4
1904	52,512	128,903	40.7	40.0
1905	338,883	846,998	40.0	39.5
1906	62,632	226,774	27.6	20.8
Skeena River				
1902	37,292	154,875	24.1	25.0
1903	22,823	98,669	23.1	27.3
1904	32,113	154,869	20.7	16.7
1905	24,127	114,085	21.2	11.1
1906	30,225	162,420	18.6	15.4
Rivers Inlet				
1902	42,804	70,298	60.9	50.0
1903	39,683	69,390	57.2	50.0
1904	54,316	94,292	57.6	50.0
1905	45,678	83,122	55.0	50.0
1906	40,190	122,878	32.7	28.6

SOURCE: Canada, Parliament, Sessional Papers (Vols. 38-42), "Annual Report of the Department of Marine and Fisheries (Fisheries)," (1902-1906); British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, (1902-1906).

TABLE 2-14

TOTAL NUMBER OF CANNERIES OPERATED
IN BRITISH COLUMBIA 1902-1906

Year	Fraser River	Rivers Inlet	Skeena River	Outlying Districts*	Total	Operated by B.C. Packers
1902	42	6	12	11	71	32
1903	36	5	11	12	64	24
1904	25	4	12	12	53	17
1905	38	4	9	13	64	21
1906	24	7	13	16	60	12

SOURCE: Canada, Parliament, Sessional Papers (Vols. 38-42), "Annual Report of the Department of Marine and Fisheries (Fisheries)," (1902-1906).

*Includes production of canneries on Vancouver Island.

possible legitimacy of his arguments, the directors forced Doyle to resign his position of general manager after the 1903 season.

Although B.C. Packers closed a large number of canneries, these closures did not substantially alter the geography of the province's salmon canning industry. Canning capacity in each district became more concentrated as the company closed plants and expanded others, but spatial centralization of canneries, even though technically possible within the districts, did not occur. The company continued operating at least two canneries in both the Skeena River and Rivers Inlet districts, and kept all but one of its plants in the outlying areas working. On the Fraser River, where the majority of closures occurred, B.C. Packers operated five canneries each year, even though the four

line Imperial Cannery had the canning capacity to handle the total company pack for the district in all but the big years. In 1905 the Imperial packed 62,081 cases of salmon, almost equalling the company's total 1906 Fraser River pack of 62,632 cases, and easily exceeding the district packs of 1907 and 1908, which were 49,786 cases and 39,673 cases respectively.[69] Like the Alaska Packers Association, B.C. Packers biggest impact was the elimination of excess canning capacity. The economies that the company realized came from lower overhead costs achieved by closing excess plants, not from scale economies at the plant level. Retaining a broad coverage of the fishing grounds and the flexibility of operations that came from operating more than one large, centrally located cannery, remained important elements of B.C. Packers' management strategy. The geographical result: wherever canning took place before the merger, it continued afterward.

CHAPTER 3

THE MOVE TO NORTHERN WATERS, 1905-1925

The years following 1905 were transitional years for the British Columbian salmon canning industry. Previously the industry had relied almost exclusively on sockeye; in any given year at least 75% of all salmon canned in the province was sockeye. The Fraser River, recognized as the world's most important sockeye river, annually packed more salmon than the province's other canning districts combined. After 1905 this pattern of production changed. The industry shifted away from the sockeye to previously ignored species of salmon--pinks, chums, and cohos--and away from the Fraser River to the province's other fishing districts. By 1925, sockeye rarely accounted for one-quarter of the total provincial salmon pack, and less than 15% of that came from Fraser River canneries. An alarming decline in the size of the Fraser River sockeye runs initiated these changes, which the development of the purse-seine and the introduction of faster canning lines had made possible. Although each of the newly targeted species ran to the major sockeye producing rivers and were packed by canners

operating there, they ran in greater numbers to the innumerable short rivers and streams between the established salmon canning districts. The use of purse-seines opened up these previously unexploited fishing grounds, and canners, still unable to tender raw fish long distances, eagerly built new plants. This altered the geography of the salmon canning industry. In 1905 all but a few salmon canneries were clustered in the estuaries of the province's major sockeye rivers; by 1925 they dotted the entire coast of the provincial mainland as well as the coasts of Vancouver Island and the Queen Charlotte Islands.

The rush to construct canneries led, as at the end of the 19th century, to overcapitalization, excess capacity, and over-production. The Dominion Department of Marine and Fisheries had introduced regulations in 1908 to prohibit the building of any new canneries, but the department began relaxing its regulations in 1911, allowed a flurry of cannery construction during World War I, and abandoned the regulations completely at the war's end. Salmon canners were left to regulate the industry on their own, with the tacit approval from the fisheries minister to use whatever measures they thought necessary. The British Columbia Salmon Canners Association tried to control competition and production through informal operating agreements. However well intended, such controls were unsuccessful; the number of companies involved made agreements difficult to achieve and practically impossible to enforce. Low prices following the 1920 season, and lasting through 1923, forced a number of companies out of business and initiated a

series of consolidations that probably did more to stabilize the canning industry than any legislation or operating agreements could have. But few plants were permanently closed. The return to prosperous operations in 1924 propelled the industry into another round of disorderly expansion. Increasing competition between canneries for fish resulted in over investment in fishing gear and drove up production costs. Despite good markets and high prices, the industry once again faced major readjustments.

Throughout these years the operations of B.C. Packers remained relatively static. The company built no new plants to exploit the new fishing grounds, nor did it pack the lesser species of salmon to the same extent as its competitors. Although frequently branded as monopolistic, the company did not pursue an aggressive acquisitions policy. During these years of rapid general expansion B.C. Packers acquired only five operating canneries: three on the Skeena, one on the Nass, and one on Rivers Inlet. Each of these gave the company better, more strategically located cannery sites within the older, established canning districts, and represented a strengthening of the company's position only within these districts. By 1925 B.C. Packers's dominant position within the canning industry had considerably waned. Whereas B.C. Packers put up close to 50 percent of all salmon canned in 1902, it accounted for less than 17 percent of the total provincial salmon pack in 1925.

* * * * *

Most salmon canners operating plants on the Fraser River expected a quick return to prosperity after the formation of British Columbia Packers. Henry Doyle had organized the new company to reduce the excessive investment, canning capacity, and competition for fish that had plagued salmon canning on the Fraser. Once the warehouses were cleared of the large carry-over from the 1901 season, markets for canned salmon would again be strong; with favourable markets and fewer canneries Fraser River canners had every reason to look forward to larger packs, quick sales, and good profits.

No one had foreseen that the industry would inherit the biological consequences of earlier overfishing. Fewer sockeye were returning each year to the Fraser; 1902 and 1903 would later be described as two of the worst seasons ever for salmon canning in British Columbia.[1] Both canners and fishermen suffered financial losses during these years as the district's production figures plummeted after the record pack of 1901.[2] Comparisons of the pack size of these years with those of their brood year (four years previously) highlight the severity of the decline: the sockeye pack of 1903 was roughly 40 percent of that in 1899; the run of 1904 produced only 22 percent of the 1900 catch. The big year of 1905 offered a respite from the small packs as the number of cases put up during the season jumped to 811,340, but this, too, was a reduction from the 998,913 cases packed in 1901; in 1906 the situation was again bleak, and through 1907 and 1908 it worsened (Table 3-1). Compounding the seriousness of this situation were the actions of American

TABLE 3-1

FRASER RIVER CANNED SALMON PRODUCTION,
1897-1912 (48 LB. CASES)

Year	Total	Year	Total
1897	879,776	1913	732,059
1898	264,331	1914	328,390
1899	527,396	1915	289,199
1900	331,371	1916	106,440
1901	998,913	1917	377,988
1902	327,095	1918	206,003
1903	237,125	1919	158,718
1904	128,903	1920	132,862
1905	846,998	1921	103,919
1906	226,774	1922	137,482
1907	163,116	1923	224,637
1908	89,184	1924	212,059
1909	567,203	1925	272,993
1910	223,148	1926	272,860
1911	301,344	1927	280,041
1912	173,921	1928	255,455

SOURCE: Canada, Parliament, Sessional Papers (Vols. 33-37, "Annual Report of the Department of Marine and Fisheries (Fisheries)," (1898-1902); British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, (1903-1928).

NOTE: Beginning in 1905 the pack from canneries located in the Victoria area (Vancouver Island) were included in the total for the Fraser River district. These packs have been subtracted from the Fraser River total in this table.

salmon canners. On their return to the Fraser River, many of the river's sockeye swim southwards parallel to the west coast of Vancouver Island, crossing over to American waters as they enter Juan de Fuca Strait. Here the fish stay close to the southern shore as they pass through the strait and the waters of Puget Sound before turning north to follow the coast of Washington State to the Fraser. New salmon traps along the coastline of Washington State from Neah Bay, at the extreme north-west tip of the Olympic Peninsula, to Point Roberts, immediately south of the entrance to the Fraser River, took a greater percentage of these fish (Map 1). Table 3-2 shows the increasing share of Fraser River sockeye taken by American canners, as well as the general decline of the total Fraser River sockeye pack after 1901.

To check, then reverse this decline, John Pease Babcock, British Columbia's Commissioner of Fisheries, proposed a complete closure of the Fraser River sockeye fishery. Closure would allow the depleted sockeye stocks to recover from the poor spawns of 1902, 1903, and 1904, years when the spawning grounds were practically deserted because canners tried to put up large packs from small runs. Canners in both British Columbia and Washington State would shut down their plants from July 10 to September 15 in 1906, 1907, and 1908, to give all sockeye unobstructed passage to the spawning grounds.[3] The Fraser River Canners Association supported this proposal, although not unanimously, and sent a delegation to meet with representatives of the Puget Sound Salmon Association to secure the compliance

TABLE 3-2

SOCKEYE SALMON PRODUCTION OF THE FRASER RIVER SYSTEM, 1891-1919 (48 LB. CASES)

Year	Canadian Waters	American Waters	Total
1891	176,954	5,538	182,492
1892	79,715	2,954	82,669
1893	457,797	47,852	505,649
1894	363,967	41,791	405,758
1895	395,984	65,143	461,127
1896	356,984	72,979	429,963
1897	860,459	312,048	1,172,507
1898	256,101	252,000	508,101
1899	480,485	499,646	980,131
1900	229,800	228,704	458,504
1901	928,669	1,105,096	2,033,765
1902	293,477	339,556	633,033
1903	204,809	167,211	372,020
1904	72,688	123,419	196,107
1905	837,489*	847,122	1,684,611
1906	183,007	182,241	365,248
1907	62,617	96,974	159,591
1908	74,574	155,218	229,792
1909	585,435	1,005,120	1,590,555
1910	150,432	234,437	384,869
1911	62,817	126,950	189,767
1912	123,879	183,896	307,775

TABLE 3-2--Continued

Year	Canadian Waters	American Waters	Total
1913	736,661	1,664,827	2,401,488
1914	198,183	336,251	534,434
1915	91,130	64,584	155,714
1916	27,394	78,476	105,870
1917	148,164	411,538	559,702
1918	19,697	50,723	70,420
1919	34,068	64,346	98,414

SOURCE: John Pease Babcock, "The Fraser River Salmon Situation: A Reclamation Project," p. U 77, in British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, 1919.

*The figures for the Fraser River pack differ from those given in Table 3-1 because the pack of Vancouver Island canneries were subtracted from that total. They are included here because the sockeye were assumed to be destined for the Fraser River.

of American canners. When neither the Puget Sound canners nor the Washington State government expressed interest in cooperating, the proposed closure was abandoned.[4] Faced with dwindling sockeye runs, and little prospect for their recovery, Fraser River canners began packing larger numbers of cohos, pinks, and chums.

Initially, most canners working the Fraser were hesitant to can what they considered "lesser species." They had developed a strong market for their product over the industry's first thirty years by packing only sockeye and the few red

springs that ran with them, and British consumers had come to associate the red colour and high oil content of these species with top quality salmon. Occasionally, if a cannery manager had a surplus of prepared cans at the end of the sockeye run, he would take cohos to ensure a full pack. In most years canners closed their plants after the peak of the sockeye run, leaving the other species of salmon, which entered the Fraser later in the year, to pass upstream unmolested. This practice began to change in 1903, the year of the first noticeable drop in the size of the sockeye run. Pack statistics for 1903 show that canners responded to the smaller sockeye catch by putting up over 25,000 cases of cohos. When the sockeye run failed again the following year, this figure almost doubled (Table 3-3). The regional inspector for the Dominion Department of Marine and Fisheries considered that diversification was a positive development for the province's salmon canning industry. Keeping the canneries open to pack cohos and eventually, he hoped, pinks and chums, would lengthen the canning season. This would benefit canners by reducing their dependence on any one run, and would give both fishermen and cannery workers a longer period of employment each year.[5] The canners, however, did not share the inspector's optimism. They feared canning the lesser species on a regular basis would flood markets with cheaper fish, and tarnish British Columbia's reputation as an exporter of the finest quality salmon. In this view packing cohos was an unwelcome expedient, acceptable only in the years when the sockeye runs were particularly poor. When a number of canners

TABLE 3-3

FRASER RIVER CANNED SALMON PRODUCTION
BY SPECIES, 1903-1927 (48 LB. CASES)

Year	Sockeye	Spring	Steelhead & Blueback	Coho	Pink	Chum
1903	204,809	2,084		25,728	4,504	
1904	72,688	9,482		45,667	1,066	
1905	811,340	5,507		26,847	3,304	
1906	178,787	6,023		28,821	13,143	
1907	59,815	4,005		35,766	63,530	
1908	63,126	1,445		24,198	415	
1909	542,248	1,428		21,540	1,987	
1910	133,045	9,943		27,855	128	52,177
1911	58,487	13,779		39,740	142,101	47,237
1912	108,784	23,028		28,574	574	12,961
1913	684,596	3,622		11,648	9,973	22,220
1914	185,483	23,485		38,639	6,057	74,726
1915	89,040	18,920	31	34,114	128,555	18,539
1916	27,394	20,313	3,129	24,580	840	30,184
1917	123,614	29,113	4,951	25,895	134,442	59,973
1918	16,849	40,045	4,395	40,111	18,388	86,215
1919	29,628	18,815	15,941	39,253	39,363	15,718
1920	44,598	24,085	4,522	22,934	12,839	23,884
1921	35,900	17,309	1,331	29,978	8,178	11,223
1922	48,744	16,861	817	23,587	29,578	17,895
1923	29,423	8,133	15	20,173	63,645	103,248
1924	39,743	7,630	1,822	21,401	31,968	109,495
1925	31,523	33,690	5,152	36,717	99,800	66,111
1926	83,598	32,952	13,776	21,783	32,256	88,495
1927	57,056	18,453	10,658	24,079	102,536	67,259

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, (1903-1927).

NOTE: Beginning in 1905 the pack from canneries located in the Victoria area (Vancouver Island) were included in the total for the Fraser River district. These packs have been subtracted from the Fraser River total in this table.

announced their intentions to pack cohos in 1905, after a good sized sockeye pack had already been put up, Henry Bell-Irving insisted that the secretary of the Fraser River Canners Association record his opposition to the practice, for "in view of the satisfactory pack of Sockeyes secured he [Bell-Irving] is of the opinion that it is exceedingly undesirable to injuriously affect the United Kingdom markets by packing inferior fish."[6] Although the minutes of the meeting do not record the opinions of other canners, pack statistics show that few canners put up any fish other than sockeye in either 1905 or 1906.

There was another reason for not doing so. Canners received much higher prices for sockeye than for the other species. Opening prices for a 48 pound case of sockeye in 1904 ranged from $5.75 to $6.25, whereas a case of cohos brought $4.25, a case of pinks only $2.75. In 1905, the prices for sockeye, cohos, and pinks were $5.00 to $5.30, $4.00, and $2.60 respectively.[7] Despite these differences in market prices, production costs for the different species were the same. Even the price canners paid fishermen for cohos in the first years they were packed was the same as that paid for sockeye, ten cents a fish. And this price had to be increased to fifteen cents at the end of the season to keep fishermen working.[8] In later years, when large quantities of pinks, chums, and cohos were put up each season, the prices fishermen received for these species reflected their lower market value.[9] But during the early years, the lesser species offered canners a much lower margin of profit than sockeye, especially if the cannery had to

be kept open after the sockeye run ended. Unless these fish could be taken as they ran with the sockeye their lower market prices barely covered a cannery's operating costs. Canning such fish was frequently unprofitable, and many canners, particularly the smaller concerns, would not do so.[19]

A few years later they had no choice. As markets for British Columbia canned salmon continued to expand, the Fraser River's sockeye stocks continued to deteriorate, forcing canners to rely on catches of cohos, pinks, and chums in order to secure adequate packs and meet demand. A large number of pinks were canned for the first time in 1907, and, although few were put up in 1908, 1909, and 1910, Fraser River canneries packed almost 150,000 cases of pinks in 1911. Chums, the least desired species and commonly called dog salmon, were packed in significant numbers beginning in 1910, when over 50,000 cases were put up. The size of the coho pack also remained fairly constant through these years, ranging between 25,000 and 40,000 cases. Despite these increases the total size of the Fraser River pack did not grow appreciably. Canners were packing these fish to supplement the declining sockeye runs; sockeye made up an ever smaller percentage of the district total. There were exceptions to this trend. The district recorded a relatively large sockeye pack in 1912 and again in 1914, as both years produced larger packs than had their brood years. Also, in 1920, 1921, and 1922 sockeye accounted for over 30 percent of the district pack, but this occurred because canners curtailed their pack of the lesser species, not because the sockeye runs

had recovered. Only in the years of the big run did the sockeye pack come close to matching its historic proportions: 96% of the district pack in 1909, and 94% in 1913. Eventually even the big years failed. In 1913, railway construction in the Fraser Canyon caused rock slides that constricted the river near Hell's Gate, preventing the sockeye that had escaped the fishermen at the river mouth from reaching the spawning grounds. Despite the efforts of fisheries officials to clear the blockage, incalculable numbers of fish died in pools downstream from the slides. The next big year, 1917, Fraser River canneries barely put up 123,000 cases of sockeye. The record Fraser River sockeye runs were a part of fishing lore. The district's sockeye pack, which had declined steadily after almost topping 1,000,000 cases in a single season at the turn of the century, rarely exceeded 35,000 cases after 1915, and rarely comprised as much as 25 percent of the district's total production (Table 3-3 and Table 3-4).

The smaller Fraser River sockeye runs of 1902, 1903, and 1904 prompted greater interest in British Columbia's other canning districts (referred to as the northern waters in government reports). Testifying before the 1905 Royal Commission investigating the condition of British Columbia's fisheries, W.H. Barker stated: "The shortage of fish on the Fraser has brought the northern rivers into prominence and is causing the people who have, and can get, the means to go north to pack salmon."[11] J.T. Williams, the Dominion fisheries

TABLE 3-4

COMPOSITION OF THE FRASER RIVER
SALMON PACK BY PERCENTAGE

Year	Sockeye	Spring	Coho	Pink	Chum	Steelhead & Blueback
1902	89.7					
1903	86.4	0.9	10.8	1.9		
1904	56.4	7.4	35.4	0.8		
1905	95.8	0.7	3.2	0.4		
1906	78.9	2.7	12.7	5.8		
1907	36.7	2.5	21.9	38.9		
1908	70.8	1.6	27.1	0.5		
1909	95.6	0.3	3.8	0.4		
1910	59.6	4.5	12.5	0.1	23.4	
1911	19.4	4.6	13.2	47.2	15.7	
1912	62.5	13.2	16.4	0.3	7.5	
1913	93.5	0.5	1.6	1.4	3.0	
1914	56.5	7.2	11.8	1.8	22.8	
1915	30.8	6.5	11.8	44.5	6.4	
1916	25.7	19.1	23.1	0.8	28.4	2.9
1917	32.7	7.7	6.9	35.6	15.9	1.3
1918	8.2	19.4	19.5	8.9	41.9	2.1
1919	18.7	11.9	24.7	24.8	9.9	10.0
1920	33.6	18.1	17.3	9.7	18.0	3.4
1921	34.5	16.7	28.8	7.9	10.8	1.3
1922	35.5	12.3	17.2	21.5	13.0	0.6
1923	13.1	3.6	9.0	28.3	46.0	

TABLE 3-4--Continued

Year	Sockeye	Spring	Coho	Pink	Chum	Steelhead & Blueback
1924	18.7	3.6	10.1	15.1	51.6	0.9
1925	11.6	12.3	13.5	36.6	24.2	1.9
1926	30.1	12.1	8.0	11.8	32.4	5.1
1927	20.4	6.6	8.6	36.6	24.0	3.8

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, (1903-1927).

NOTE: Salmon packed in Victoria area canneries but credited to the Fraser River District have been subtracted.

*The remainder of the pack of 1902 was not broken down by species, but listed under the heading of spring and fall salmon.

inspector for the northern district, substantiated Barker's testimony, claiming that the canners knew the Fraser was becoming "fished out," were abandoning their operations on the river, and were moving into his district.[12] The record of new cannery construction bears Williams out. Sixteen new plants were built in the northern districts between 1903 and 1907. Ten of these were constructed after 1904, following the three consecutive failures of the Fraser River sockeye runs. And ten of the sixteen were located within the boundaries of established canning districts: four on Rivers Inlet, four on the Skeena, and two on the Nass.[13] Provincial pack statistics reflect the construction of these plants, and the growing interest in the northern districts (Table 3-5). Allowing for seasonal fluctuations, the combined pack from the northern districts had

TABLE 3-5

FRASER RIVER VERSUS NORTH COAST PACK
(48 LB. CASES)

Year	Fraser River	%	Districts Outside the Fraser River	%	Provincial Total
1891	173,491	56	136,522	44	310,013
1892	98,491	40	150,230	60	248,721
1893	474,237	78	133,469	22	607,706
1894	363,566	74	128,666	26	492,232
1895	400,976	67	200,005	33	600,981
1896	375,345	61	242,438	39	617,783
1897	879,776	86	147,430	14	1,027,206
1898	264,331	54	228,326	46	492,657
1899	527,396	69	238,123	31	765,519
1900	331,371	55	275,169	45	606,540
1901	998,913	80	248,299	20	1,247,212
1902	327,095	52	298,887	48	625,982
1903	237,125	50	236,549	50	473,674
1904	128,903	28	336,991	72	465,894
1905	846,998	73	320,462	27	1,167,460
1906	226,774	36	402,686	64	629,460
1907	163,116	30	384,343	70	547,459
1908	89,184	16	453,505	84	542,689
1909	567,203	59	400,717	41	967,920
1910	223,148	29	539,053	71	762,201
1911	301,344	32	647,621	68	948,965
1912	173,921	17	822,655	83	996,576
1913	732,059	54	621,842	46	1,353,901
1914	328,390	30	782,649	70	1,111,039
1915	289,199	26	844,182	74	1,133,381
1916	106,440	11	888,625	89	995,065
1917	377,988	24	1,179,497	76	1,557,485
1918	206,003	13	1,410,154	87	1,616,157
1919	158,718	11	1,234,438	89	1,393,156
1920	132,862	11	1,054,743	89	1,187,605
1921	103,919	17	499,629	83	603,548

TABLE 3-5--Continued

Year	Fraser River	%	Districts Outside the Fraser River	%	Provincial Total
1922	137,482	11	1,152,844	89	1,290,326
1923	224,637	17	1,117,040	83	1,341,677
1924	212,059	12	1,533,254	88	1,745,313
1925	272,993	16	1,446,289	84	1,719,282
1926	272,860	13	1,792,330	87	2,065,190
1927	280,041	21	1,080,593	79	1,360,634
1928	255,455	13	1,780,174	87	2,035,629
1929	422,993	30	975,777	70	1,398,770
1930	272,649	12	1,949,170	88	2,221,819
1931	73,067	11	612,037	89	685,104
1932	126,641	12	954,390	88	1,081,031
1933	199,082	16	1,065,967	84	1,265,049
1934	273,139	17	1,310,697	83	1,583,836

SOURCE: Totals from 1891-1901, inclusive, are from Dominion Pack Statistics; Canada, Parliament, Sessional Papers (Vols. 25-37), "Annual Report of the Department of Marine and Fisheries (Fisheries)" (1891-1902); British Columbia, Department of Marine and Fisheries, Report of the Commissioner of Fisheries (1903-1934).

NOTE: Salmon packed in Vancouver Island canneries (Victoria area) but credited to the Fraser River total in the provincial pack statistics have been subtracted from the Fraser River district and added to the districts outside of the Fraser River area.

grown steadily through the 1890's, doubling in size between 1891 and 1900 (136,522 cases to 275,169 cases). While smaller packs were being put up on the Fraser, production in the northern districts continued to increase, jumping to almost 300,000 cases in 1902, easily exceeding that mark in 1904, and topping 400,000 cases by 1906. As proportions of the provincial total these packs represented 48 percent, 72 percent, and 64 percent

respectively. Although this percentage dropped in 1905, a big year on the Fraser, it rose again to 64 percent in 1906 and increased to 70 percent in 1907. In 1908 the northern waters accounted for 84 percent of all salmon packed in the province. In spite of the larger packs put up in northern canneries the total provincial pack remained fairly stable. Except for the big year of 1905 it varied between 460,000 and 630,000 cases, a level reached many times during the 1890's. Sockeye still made up the largest percentage this total, although the Fraser River contributed a steadily diminishing proportion of these fish.

With canners shifting their operations to northern waters and putting up larger northern packs, there was increasing concern over the future of northern sockeye stocks. The report published by the Royal Commission of 1905 placed the blame for the reduced sockeye catches on the Fraser on overfishing, and attributed overfishing to too many canneries. The report went on to caution the Dominion minister responsible for fisheries that if he did not move quickly to introduce strict regulations governing the construction and operation of salmon canneries in the province's northern districts, the problems experienced on the Fraser would quickly be felt there as well. Too many canneries, it argued, inevitably led to heightened competition for fish, an increase in the number of boats each cannery outfitted, and overfishing. To prevent this, the report recommended sweeping changes in fishery regulations. Each cannery should be required to apply annually for an operating licence. No cannery should be built or operated without the

approval of the Minister of Marine and Fisheries. The Minister should freeze the number of operating canneries in the northern districts at the present level by not approving the construction of any new canneries. The minister should set the maximum number of boats that could be outfitted and fished by the canneries in each of the established canning districts (boat-ratings).[14]

Although these recommendations called for much stricter regulation of the canning industry, they drew support from many salmon canners. Robert Bell-Irving had suggested to the Royal Commission that canners presently active in the industry, having just gone through a period of crisis and readjustment, realized all too well the dangers of operating too many canneries in one district. Canners, he argued, knew their industry's future depended on a program of sound resource management to ensure conservation of salmon stocks, and recognized that they had a part to play in this program. Responsible canners had already closed a number of plants on Rivers Inlet and the Skeena River because they believed canning capacity in these districts exceeded the ability of the salmon runs to support them. If the Fisheries Department did not restrict entry into the industry, the efforts of such canners would be in vain. The benefits arising from measures taken to reduce canning capacity and protect salmon runs would be enjoyed by newcomers to the industry little concerned for its future. Therefore, allowing the construction of new canneries would place excessive pressure on fish stocks and jeopardize established companies.[15]

An example of what the canners feared was unfolding on the central coast. In 1901 Robert Draney had built the Kimsquit Cannery, a simple one line plant near the head of the Dean Channel, to pack the small sockeye run of the Kimsquit River. Over the next six years the cannery averaged a pack of 7,826 cases of sockeye a season. All of the salmon was supplied by thirty boats, outfitted with nets of 150 fathoms in length by thirty-five meshes deep, fishing within a few kilometres of the cannery wharf. Then, in 1907, George Dawson and A.J. Buttimer constructed the Manitou Cannery directly across the channel from Kimsquit. These two men were experienced cannery operators. For years they had been the principals in the Brunswick Canning Company, operating plants on the Fraser and on Rivers Inlet, but had sold out their interests in this company to B.C. Packers in 1902. Now they were re-entering the industry, and had already built one new plant on the Fraser (Harlock Island in 1905), and one on Rivers Inlet (Kildala in 1906).[16] By 1910 the presence of their Manitou Cannery heightened competition for fish between the two canneries, forcing them to outfit a total of 120 boats, most with nets 200 fathoms long by 40 meshes deep; their fleets fishing as far south as Labouchere Channel, more than fifty kilometres away (Map 2). The average combined pack of the two plants was 12,560 cases.[17] Canners such as Bell-Irving could draw but one conclusion: unless government moved to deny access to the salmon canning industry competition between canneries for a limited supply of fish could only lead to higher production

costs, smaller packs per cannery, increased pressure on the salmon stocks, lower profits, and crisis within the industry.

Although too late to prevent the Kimsquit-Manitou situation from developing, the Dominion government accepted the recommendations outlined in the report of the Royal Commission of 1905. New fisheries regulations introduced in 1908 required that each cannery receive an annual operating licence from the Minister of Marine and Fisheries before canning could begin. No new canneries would be licenced to operate in the northern districts before 1911. Also, the British Columbia Department of Fisheries enacted its own regulations, the "Cannery Revenue Act," which closely paralleled those brought in by the Dominion government.[18] Both stopped short, however, of establishing boat-ratings, leaving canners to sort out this matter among themselves.[19] When canners failed to agree on voluntary boat-ratings in 1908 and 1909, the Provincial Department of Fisheries intervened, fixing the number of fishing licences at the 1908 level and preventing canners from increasing the size of their fishing fleets.[20] This action attracted the attention of the Dominion Department of Marine and Fisheries, which claimed sole jurisdiction over salmon fishing. Having dismissed the issue only one year before, the Dominion Department reacted quickly to provincial action by appointing a special commission to establish boat-ratings for the 1910 season. After touring the northern districts and consulting with canners and fisheries inspectors, the commissioners determined the maximum number of boats that could safely be fished on the Skeena River and on

Rivers Inlet, and apportioned to each cannery in the districts a share of the total. They recommended that these ratings be kept in force for a minimum of five years, and that during this period the minister prohibit the construction of new canneries.[21]

Regulations prohibiting the construction of new canneries in the north (in place from 1908 through 1910) forced canners to focus their attention on existing plants in the established canning districts. Here they concentrated on packing sockeye to supplement the smaller packs being put up on the Fraser River. Sockeye comprised most of the increased production of northern canneries between 1908 and 1910. Northern canneries put up fewer cases of cohos, pinks, and chums in 1909 and 1910 than they had in 1908 (Table 3-6). The largest sockeye pack from outside the Fraser River district, 432,870 cases, was recorded in 1910, the same year that total northern production exceeded 500,000 cases for the first time. Larger sockeye packs in the north accounted for practically all of the increase in provincial pack size over these years (Table 3-5, Table 3-6, and Table 3-7). The installation of a second canning line in some of the northern canneries only partially explains these larger packs. By 1910 six of the twelve canneries on the Skeena had two lines, as had three of the seven on Rivers Inlet,[22] and two line plants generally put up more fish than one line plants. But often the packs were only marginally larger, and some one line plants regularly matched or bettered the pack put up in two line canneries.[23] Unless a cannery could increase its boat

TABLE 3-6

PRODUCTION OF SALMON CANNERIES LOCATED OUTSIDE THE FRASER RIVER DISTRICT, BY SPECIES (48 LB. CASES)

Year	Sockeye	Spring	Steelhead & Blueback	Coho	Pink	Chum
1903	163,908	23,573		26,190	22,878	
1904	250,538	25,939		25,484	35,030	
1905	296,333	22,852		17,611	10,666	
1906	280,892	26,321		40,311	55,162	
1907	254,259	22,093	683	52,134	55,174	
1908	291,897	26,719	1,137	57,719	76,033	
1909	298,193	17,589		40,378	44,557	
1910	432,870	18,846	140	46,527	34,485	6,185
1911	325,022	34,677		80,062	163,146	44,714
1912	335,978	57,409		136,735	247,169	45,364
1913	287,582	37,427		58,174	188,914	55,745
1914	351,213	25,843		81,562	214,283	109,748
1915	387,002	39,184	2,896	112,842	238,797	63,461
1916	187,395	46,413	5,953	159,043	279,804	210,017
1917	216,234	47,163	6,789	131,694	362,317	415,300
1918	259,610	67,309	11,521	150,957	509,357	411,400
1919	339,817	81,736	12,875	136,417	307,276	356,317
1920	306,807	94,214	5,934	79,038	508,008	60,742
1921	128,014	32,443	6,949	87,310	184,728	60,185
1922	250,870	22,735	7,271	79,258	552,401	240,309
1923	305,224	19,009	8,842	91,871	377,287	314,807
1924	329,860	19,826	4,256	94,321	625,570	459,421
1925	360,995	38,364	7,310	152,157	346,365	541,098
1926	253,414	36,227	7,525	140,666	740,756	613,742
1927	250,996	38,065	11,854	138,653	145,090	495,935

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1903-1927).

NOTE: Totals in this table include salmon packed in Vancouver Island canneries but credited to the Fraser River district in the provincial statistics.

TABLE 3-7

TOTAL PROVINCIAL SALMON PACK,
BY SPECIES (48 LB. CASES)

Year	Sockeye	Spring	Steelhead & Blueback	Coho	Pink	Chum
1903	368,717	25,657		51,918	27,382	
1904	323,226	35,421		71,151	36,096	
1905	1,080,673	28,359		44,458	13,970	
1906	459,679	32,344		69,132	68,305	
1907	314,074	26,098	683	87,900	118,704	
1908	355,023	28,164	1,137	81,917	76,448	
1909	840,441	19,017		61,918	46,544	
1910	565,915	28,789	140	74,382	34,613	58,362
1911	383,509	48,456		119,802	305,247	91,951
1912	444,762	80,437		165,309	247,743	58,325
1913	972,178	41,049		69,822	192,887	77,965
1914	536,696	49,328		120,201	220,340	184,474
1915	476,042	58,104	2,927	146,956	367,352	82,000
1916	214,789	66,726	9,082	183,623	280,644	240,201
1917	339,848	76,276	11,740	157,589	496,759	475,273
1918	276,459	107,354	15,916	191,068	527,745	497,615
1919	369,445	100,551	28,816	175,670	346,639	372,035
1920	351,405	118,299	10,456	101,972	520,847	84,626
1921	163,914	49,752	8,280	117,288	192,906	71,408
1922	299,614	39,596	8,088	102,845	581,979	258,204
1923	334,647	27,142	8,857	112,044	440,932	418,055
1924	369,603	27,456	6,078	115,722	657,538	568,916
1925	392,518	72,054	12,462	188,874	446,165	607,209
1926	337,012	69,179	21,301	162,449	773,012	702,237
1927	308,052	56,518	22,512	162,732	247,626	563,194

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1904-1927).

rating (as B.C. Packers was able to do when it established its multi-line canneries in 1903 and 1904) one canning line could handle all of the fish delivered in a single day.[24] Hence many northern canneries remained single line plants, and nearly all of them recorded larger packs during this period, without the introduction of faster, more modern equipment.[25] They were able to do this because of a change in attitude on the part of provincial canners towards their northern operations. Until this time most canners had viewed the northern districts as peripheral to the Fraser River. They normally operated their northern plants well below rated capacity, and often curtailed northern production if exceptionally large packs were expected on the Fraser. Smaller sockeye runs to the Fraser heightened the importance of the northern districts. Canners began utilizing previously unused plant capacity to put up as many sockeye as possible. When the runs were good and the fishing conditions favourable, as they were on the Skeena in 1910, northern canneries packed as many fish as could be caught.

The concentration of northern canning in the older, established districts began to change in 1911 when the Minister of Marine and Fisheries, acting against the recommendations of the 1910 Boat-Rating Commission, again permitted the construction of new canneries.[26] A flurry of new construction followed. From 1911 through 1914 eighteen new cannery licences were granted: five in 1911, eight in 1912, four in 1913, and one in 1914. Three of the canneries never recorded a pack and were probably never built, of the remaining fifteen, most were

located in areas along the coast were salmon had never been canned before. The Alliford Bay and Naden Harbour plants were the first canneries on the Queen Charlotte Islands. The Quatsino Cannery brought salmon canning to the north-west coast of Vancouver Island. The Butedale, Charles Creek, Jervis Inlet, and Redonda Bay canneries were the first of many plants that would be built along the provincial mainland between the older canning districts. World War I initiated another round of cannery construction, which began in 1916. The increased demand for nonperishable foodstuffs almost tripled the market price for canned salmon between 1913 and 1920. A 48 pound case of sockeye brought an opening price of $7.75 in 1913, $16.00 in 1917 and 1918, and over $20.00 in 1920; opening prices for the lesser species also rose, but not as dramatically.[27] To take advantage of these prices canners hurried more plants into production. Nine new cannery licences were issued in 1916, eight in 1917, and seven in 1918, the year the Dominion government withdrew all restrictive regulations governing the licencing of salmon canneries.[28] In 1918, eighty-seven canneries were licenced to pack salmon in B.C, twenty more than had operated in the record year of 1901. Like 1901, the 1918 pack exceeded all those before it, and many canners feared that with no restrictions on cannery construction, a crisis would soon follow. A few began idling some of their plants in 1919; by 1921, with the canning industry well into an expected post-war recession, the number of operating canneries had fallen by thirty. Many canneries had been closed as the industry attempted to reduce production, and

as individual companies made efforts to reduce operating expenses. Yet, two new plants were licenced in 1919, one in 1920, three more in 1922, three in 1924, and one in 1925.[29] In total, forty-five new salmon canneries were built in British Columbia's northern canning districts from 1911 through 1925.[30] All but six of these plants were located outside of the established districts, on either Vancouver Island, the Queen Charlotte Islands, the Outlying Districts, or in areas immediately outside of the the main canning districts but included in them for statistical purposes (Maps 1 and 2).[31] A new method of commercial fishing, purse-seining, was behind nearly all of this cannery construction.

Unlike gill-nets, which ensnare the fish, purse-seines encircle a school of fish with a long, small meshed webbing, then, after drawing the net closed at the bottom with a purse line, trap the fish inside. Once closed, the net is pulled alongside the seine boat and the fish are brailed onto the deck, or into the hold. This method of fishing had been widely used in the east coast fisheries at least since the 1860's, but was first tried in the Pacific coast salmon fishery by American fishermen working the protected waters of Puget Sound in the 1880's. The seine net was carried on a flat bottomed scow that, along with an eight man skiff, was towed out to the fishing grounds by a cannery tender at the beginning of each season. To make a set, fishermen secured one end of the net to the scow and used the skiff to pull out the net in a circle to surround an approaching school of fish. When the set was completed and the

two ends of the net brought together on the scow, the purse was drawn using a manual winch. The crew then hauled the net in alongside the scow, emptied it, and transferred the catch to a tender for delivery to the cannery. It was a slow, cumbersome, laborious process. Estimates of the time required by a crew of ten to make a set vary from one to two hours, enough time for many of the salmon initially surrounded to escape. The mobility of early seine crews was severely restricted. They could not follow the fish, or easily move to a new location if fishing was bad, but had to wait for a school of fish to move into the fishing area before there was any chance of making a successful set.[32] Despite these limitations a small number of Canadian fishermen were purse-seining by 1904. Working out of ports on Vancouver Island, they used purse-seines to intercept salmon off the south-western shore of the island before the fish passed into American waters and the traps of canners in Washington State.[33]

The introduction of the gasoline engine to the fishing fleet suddenly made purse-seining much more feasible. Small, open boats, outfitted with a platform or table in the stern on which the net was carried, powered by a five to twelve horsepower gas engine, replaced the scows, cut the time required to make a set to thirty minutes, and reduced the crew size to six. These boats, with a small skiff in tow, could venture daily to the fishing grounds where they were able to locate and follow the fish. To make a set the crew secured one end of the net to the skiff, using it as a buoy, while the power boat was

used to lay out the net around the school of fish. With the circle complete both ends of the net were brought aboard the power boat and a winch, initially hand operated but soon run by a line shaft off of the engine, drew the purse. The net was then hauled in and emptied. When the seiner was full of fish the captain made for the nearest cannery tender, unloaded the salmon, and resumed fishing. The first gas powered purse-seiners appeared on Puget Sound in 1903. When they were first used on Canadian waters is uncertain. Nevertheless, by 1911 Canadian fishermen, using large powerful boats suited for open water fishing, were working the Swiftsure Bank in the Strait of Juan de Fuca. Although this fishery developed rapidly --twenty-two purse-seine licences were issued for the area in 1911, over 100 in 1912--it was not without problems.[34] The Commissioner of Fisheries for British Columbia noted the condition of the salmon taken on the bank "is such that the majority of the canners would prefer not to handle them." Unlike estuary caught salmon, these fish, particularly cohos and springs, were still actively feeding. Their abdomens were often swollen with food, which broke down quickly to infect adjacent tissue, and their soft, pulpy flesh deteriorated rapidly. Even canneries located nearby on Vancouver Island had to reject whole deliveries, and were still accused of packing fish that should have been turned away.[35] Moreover, although British Columbian canners gained a slight advantage over their American counterparts, they did so by taking fish that were probably destined for the Fraser River and would likely have been caught

eventually. The bank fishery increased pressure on Fraser River fish stocks, for the gill-net fishermen still sought to maintain their former catches.

Where gasoline engine powered purse-seiners had their greatest impact was on northern waters. The method and mobility of the fishery opened up new fishing grounds at the mouths of small rivers and streams outside of the main canning districts, where pink and chum salmon school and mill about before proceeding upstream to spawn. At last able to harvest these grounds, canners built new canneries nearby. Nearly all of the canneries built outside of the established canning districts after 1911 depended entirely on purse-seining for their supplies of fish--all those on the Queen Charlotte Islands did, as well as those on Vancouver Island, except in the Alberni Inlet where gill-netting also took place. Most of the canneries located in the Outlying Districts relied exclusively on purse-seines, although some, along with the canneries built just outside of the main canning districts, fished a combination of purse-seines and gill-nets, or purse-seines and beach seines. Fishery regulations required all canneries built within the older canning districts to outfit their fleets with gill-nets.[36]

The introduction of gasoline engines also had an impact on the gill-net fishery, although this impact was limited, for the most part, to the Fraser River. The engines were introduced to the gill-net fleet just after 1900. In 1907, the first year they are mentioned in Dominion government fisheries reports, they were used by 50 percent of the Fraser River fleet. By 1913

this figure had risen to 80 percent. These boats were far more productive than the older, oar and sail powered gill-netters. They permitted fishermen to make more sets in the same time, gave them greater mobility, enabled them to increase their fishing area by working further offshore, and, because gas-powered boats allowed fishermen to deliver their catches to the cannery, they allowed canners to use their tenderboats to service the growing purse-seine fleet. Also, gas-powered boats could be operated by one man, eliminating the need for a boat puller.[37] While these were advantages on the Fraser, where canners faced chronic labour shortages and most fishermen owned their own boats and paid for the new engines themselves, the situation in the north was quite different. There, canners still owned the fishing fleets, and used the fishing boats to attract workers to their canneries. The 1910 Commission had considered this when determining boat-ratings, basing the ratings on fishermen using oar and sail powered boats. If the more efficient gas powered boats were used, the boat-rating for each cannery would have to be lowered to protect fish stocks. With fewer boats available cannery managers would have difficulty obtaining enough workers to operate their plants. For this reason canners asked the Dominion Department of Fisheries to prohibit the use of gasoline engines in gill-net boats wherever a boat rating was in effect.[38] The Department agreed, and banned gasoline engines from northern waters until 1924. When gasoline engines were finally permitted, only whites and Indians were allowed to use them. Japanese fishermen were

not.[39] A regulation passed in 1912 permitted the use of the engines in trolling and purse-seining operations.[40]

Inside the canneries there were changes to complement the new fishing methods. The most important technological innovations were E.A. Smith's automatic butchering machine, quickly dubbed the Iron Chink because of the large number of Chinese workers it displaced, and the Sanitary Can, so called because it virtually eliminated the use of solder in the can making and sealing process and thus reduced the chance of lead contamination. Both innovations replaced workers with machinery. Both innovations eliminated production bottlenecks and increased production. Both innovations increased the speed of the canning lines and encouraged canners to refine other parts of the canning process to further increase productivity. Patrick O'Bannon suggests that a symbiotic relationship existed between the innovations introduced inside the canneries, particularly the Iron Chink, and those introduced on the fishing grounds, notably the gasoline engine--"each contributed to the rapid acceptance of the other."[41] The use of motor powered boats gave fishermen the potential to catch more salmon; to exploit this potential canners had to be able to process the fish more quickly, before it spoiled.

On the Fraser, the adoption of automatic butchering machines by salmon canners seemed as much a response to labour shortages and rising labour costs as to demands for faster canning lines and for greater productive capacity. Both incentives developed more or less concurrently, and both were

felt most acutely at the butchering tables at the head of the canning lines. Here, teams of highly skilled Chinese workers manually butchered and cleaned the salmon as they entered the cannery. The size of these butchering crews is unclear. Certainly they varied between canneries in relation to the capacity of the plant's canning lines, and probably from season to season depending on the expected size of the run. Figures from Washington State suggest that a crew of nine, four butchers and five slimers, usually served each canning line: the butchers removing the head, tail, and fins of the salmon, then slitting open and cleaning out the entrails of the body cavity; the slimers cleaning the salmon more carefully after it had been butchered. Over a ten hour day a skilled butcher could dress an average of three fish per minute, and in one day a team of four butchers, with the aid of slimers, prepared roughly 7,200 salmon, enough for about 575 cases of sockeye.[42] Because of their position on the line the pace of these workers dictated the line's speed. Any attempt by canners to expand production by increasing the speed of the canning lines required the hiring of larger butchering crews, an option canners came increasingly to reject. Chinese labour generally, and skilled labour in particular, was becoming scare and, in the minds of canners, expensive--labour shortages enabled available workers to demand more money in return for their dexterity with a butcher knife.[43] Mechanized butchering provided the solution, and a number of different butchering machines were being tested in American canneries as early as 1901. By 1907 Smith's Iron Chink had

proved itself as being superior. The machine easily processed 30,000 fish in a ten hour day (enough to supply two or sometimes three canning lines), replaced roughly eighteen butchers, and although it did not completely eliminate the need for slimers, productivity of the few slimers required rose substantially because the machine did a better job of initial cleaning.[44] The Smith Cannery Machines Company stressed the labour saving qualities of the Iron Chink in its advertisements, and many canners that had used the Iron Chink submitted testimonials highlighting both the savings in labour costs and the increased productivity enjoyed after introducing the machine to their lines.[45] The Iron Chink offered other critical advantages over manual butchering: it produced a consistent high quality butchering (the quality remained high even if the lines operated longer hours at the peak of the season), and it trimmed off the tail and head of the fish much closer than manual butchers, saving about half a fish to the case. Unlike other butchering machines it was vertically oriented, occupying much less floor space inside the cannery, space that could be used either to add another canning line or to increase the amount of inside storage space.[46] In later years, when northern canneries began to stay open well into the fall to pack later runs of pink and chum salmon, the Iron Chink proved indispensable, for it did the work "that it is impossible to get labor to do on account of the terrific cold weather in the North".[47] The Iron Chink removed the production bottleneck at the head of the canning line and in subsequent years each of the processes that followed it, can

filling, salting, weighing, and sealing, was mechanized or refined to speed up the canning line to take advantage of the increased supply of fish.[48]

The sanitary can was the next major change to the canning lines, increasing their speed, and further freeing canners from the costs of expensive, highly skilled workers. But installation of the machinery--exhaust boxes and double seamers--was costly, and some canners hesitated to adopt the new process because of their large investment in older machinery, much of which would be rendered obsolete.[49] Yet the sanitary can offered many advantages. It eliminated the need for topping machines, which placed tops on the cans after they were filled; soldering machines, or large crews of Chinese workmen who worked at the soldering tables; the first cook in the retorts, because high temperatures in the exhaust boxes partially cooked the salmon; and venting and resealing the cans after the first cook. It reduced the time spent in the retorts for the second cook from two hours to thirty minutes, and reduced the number of faulty cans to only three or four per ten thousand. Instead, open cans of salmon passed along a conveyor from the filling tables (or machines) into an exhaust box. Steam was injected into the box, raising the internal temperature to roughly 210° F. This exhausted the air from the can, which created a partial vacuum and prevented the salmon from spoiling once the can was topped and sealed. After fifteen to twenty minutes inside the box the can exited, a lid was placed on top, and, as the can cooled the internal vacuum drew the lid down tight, ensuring a

good fit. The can then went to the double seamer where the flanged can and the lid were folded together to make the seal, and then to the retorts for cooking. This process was faster, allowed for increased production, and produced a larger, better quality pack at a much lower cost.[50] The American Can Company, which manufactured sanitary can equipment, advertised that sanitary cans cut production costs by twenty cents a case. Henry Doyle, who had installed sanitary can equipment in his Mill Bay Cannery prior to the 1913 season (the first year sanitary cans are known to have been used in British Columbia) claimed even greater savings: based on operations for 1913 he saved 28.3 cents on each case of one pound talls packed, and 39.25 cents on each case of half pound flats; total estimated saving for the season using sanitary instead of soldered cans was $11,000, more than enough to cover the cost of installing all the new equipment.[51]

The introduction of new equipment did not occur uniformly throughout the province, or even within the canning districts. Labour contracts drawn up by the Canners Association prior to the season gave two price structures for Chinese contract labour: one when Iron Chinks or filling machines were used, and one when they were not.[52] Doyle notes that even in canneries where filling machines were installed, both hand and machine filling was done.[53] He also describes the Wales Island Cannery, built in 1911, as a well-equipped plant, yet it had no Iron Chink.[54] The factors canners considered when deciding whether or not to introduce new equipment into their plants can only be

speculated on. Undoubtedly they were based on operating conditions unique to each plant. Canneries that drew most of their workers from nearby settlements not only had a more secure supply of labour, but probably paid less for it, and had less need to substitute costly machinery for scarce workers. Canneries depending entirely on gill-netting for their fish supply could, generally, operate at a slower, steadier pace, because the number of fish delivered to the cannery at any one time rarely exceeded the capacity of the line. Conversely, purse-seiners delivered much greater volumes of fish, demanding faster, more mechanized lines. The Bella Coola Cannery, which employed local labour and outfitted only gill-netters, had two still largely manual lines in 1923: the machinery used was limited to two fish knives, two clinchers, two exhaust boxes, two double seamers, a lacquer machine, and four retorts. The cannery operated from May through September, canned all species of salmon, yet over the preceding five years had packed an average of only 26,800 cases per season. In contrast the Watun Cannery, located on Masset Inlet on the Queen Charlotte Islands, outfitted purse-seiners, canned only pinks, and operated only during July and August--yet it put up over 50,000 cases each season. It also had two lines, but they were fully mechanized, using two Iron Chinks, a sliming machine, four filling machines, two clinchers, two exhaust boxes, two double seamers, two lacquer machines, and seven retorts.[55] By 1923 most canneries in the province had at least two lines, a few had more, but as

the above examples show, there was still great diversity in levels of mechanization.

Together, the innovations introduced on the fishing grounds and inside the canneries, and the construction of new salmon canneries after 1911, led to spectacular increases in the production of canned salmon. Beginning in 1911 the size of the provincial pack reached a level previously attained only in the big years on the Fraser River; production increased again in 1912, exceeded one million cases in 1913, and remained above that figure in all succeeding years except 1916 and 1921. The provincial pack reached 1.6 million cases in 1918, declined slightly through 1919 and 1920, dropped precipitously in 1921, but rose above 1.7 million cases by 1924, and stayed at that level through 1925. Northern salmon canneries, putting up greater numbers of the lesser species, accounted for all the industry's growth during this period (Table 3-7 and Table 3-8).

Allowing for annual fluctuations in the size of pack, each of the northern districts contributed to this increased production, but by far the greatest increases came from canneries located outside the established canning areas, in the Outlying Districts, the Vancouver Island district, and the Queen Charlotte Island district. Because these regions lacked major sockeye producing streams, they had been left undeveloped during the early years of the industry; however, with the shift towards packing the lesser species, thirty-three of the forty-six canneries built from 1911 through 1925 were located in these areas. Each of these plants was constructed to take advantage

TABLE 3-8

PROVINCIAL PRODUCTION OF CANNED SALMON, BY CANNING DISTRICT (48 LB. CASES)

Year	Fraser	Skeena	Nass	Rivers	Outlying Districts	Total
1903	237,125	98,669	18,094	75,530	44,256	473,674
1904	128,903	154,869	29,587	101,972	50,563	465,894
1905	846,998	114,085	32,725	83,122	90,530	1,167,460
1906	226,774	162,420	32,534	122,878	84,854	629,460
1907	163,116	159,255	31,832	94,064	99,192	547,459
1908	89,184	209,177	46,908	75,090	122,330	542,689
1909	567,203	140,739	40,990	91,014	127,974	967,920
1910	223,148	222,035	39,720	129,398	147,900	762,201
1911	301,344	254,410	65,684	101,066	226,461	948,965
1912	173,921	254,258	71,162	137,697	359,538	996,576
1913	732,059	164,055	53,423	68,096	336,268	1,353,901
1914	328,390	237,634	94,890	109,052	341,073	1,111,039
1915	289,199	279,161	104,289	146,838	313,894	1,133,381
1916	106,440	223,158	126,686	85,383	453,398	995,065
1917	377,988	292,219	119,495	95,302	672,481	1,557,485
1918	206,003	374,216	143,908	103,155	788,875	1,616,157
1919	158,718	398,877	97,512	80,367	657,682	1,393,156
1920	132,862	332,583	81,144	157,316	483,700	1,187,605
1921	103,919	234,765	51765	59,272	153,827	603,548
1922	137,482	482,305	124,071	79,712	466,756	1,290,326
1923	224,637	338,863	99,580	132,274	546,323	1,341,677
1924	212,059	390,858	142,939	117,445	882,012	1,745,313
1925	272,993	348,859	89,008	217,900	790,522	1,719,282
1926	272,860	407,524	92,749	117,022	1,175,035	2,065,190
1927	280,041	187,716	39,828	99,139	753,910	1,360,634

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1904-1927).

NOTE: The figures for Rivers Inlet includes production from Smith Inlet. The figures for Outlying Districts combines production from the Outlying Districts, Vancouver Island, and the Queen Charlotte Islands.

of isolated runs of pink and chum salmon. Practically all of them depended on purse-seines to catch the fish. The construction of these canneries transformed the geography of salmon canning in the province. They took salmon canning out of the older clusters, which remained important sockeye districts, and spread it outward along the intervenient coastline and over to the major offshore islands.

The changing geography was reflected in the changing production patterns of the industry. The combined pack from canneries located outside the main canning districts more than doubled from 1907 to 1911, a consequence of canners placing greater emphasis on their operations there, jumped from 1911 to 1912 with the construction of new canneries, declined slightly from from 1913 through 1915, then took off in 1916. After 1916 canneries in the Outlying Districts and the offshore districts of Vancouver Island and the Queen Charlotte Islands regularly packed well over half a million cases of salmon (Table 3-9). Together these districts accounted for over 40 percent of the total provincial pack, and over 75 percent of their fish were either pinks or chums (Table 3-10 and Table 3-11). Throughout this period the number of sockeye packed in these districts remained fairly constant. Canneries built prior to 1908, when sockeye was still the primary species, put up most of these fish; most canneries built outside of the established districts after 1911 did not pack sockeye, and if they did the numbers were incidental. The Lummi Bay, or Nitinat Cannery, built on the west coast of Vancouver Island in 1917 to exploit the large

TABLE 3-9

PRODUCTION OF CANNED SALMON FROM THE QUEEN CHARLOTTE ISLANDS, VANCOUVER ISLAND, AND THE OUTLYING DISTRICTS (48 LB. CASES)

Year	Queen Charlotte Islands	Vancouver Island	Outlying District	Total
1902		16,410	34,086	50,496
1903		12,360	31,896	44,256
1904		16,938	33,625	50,563
1905		39,917	50,613	90,530
1906		40,511	44,343	84,854
1907			99,192	99,192
1908			122,330	122,330
1909			127,974	127,974
1910			147,900	147,900
1911			226,461	226,461
1912			359,538	359,538
1913			336,268	336,268
1914			341,073	341,073
1915			313,894	313,894
1916		145,763	307,635	453,398
1917		377,884	294,597	672,481
1918		392,663	396,212	788,875
1919		276,519	381,163	657,682
1920		87,971	395,729	483,700
1921		73,259	80,568	153,827
1922		188,612	278,144	466,756

TABLE 3-9--Continued

Year	Queen Charlotte Islands	Vancouver Island	Outlying District	Total
1923		193,484	352,839	546,323
1924	195,811	277,267	408,934	882,012
1925	81,134	267,766	441,622	790,522
1926	373,815	349,813	451,407	1,175,035
1927	109,889	377,800	266,221	753,910

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1904-1927).

NOTE: From 1907 through 1915 provincial pack statistics listed production from Vancouver Island, the Queen Charlotte Islands, and the Outlying District under the heading of Outlying Districts. The provincial Department of Fisheries began listing Vancouver Island production separately in 1916, and Queen Charlotte Island production separately in 1924.

Vancouver Island production includes salmon packed in Victoria area canneries, but listed under Fraser River totals in the provincial pack statistics.

run of chum salmon to the Nitinat River, is an excellent example of one of these plants. In that year the Lummi Bay Packing Company, using just two purse-seines, caught enough fish to pack over 51,000 cases, and in addition sent over 1,000,000 pounds of raw salmon to its canneries in Washington State. In 1918, using two purse-seines and a trap driven at the mouth of the Nitinat River, the company put up nearly 85,000 cases of salmon, the largest pack from any one cannery in the province, and still exported over 5,000,000 pounds of raw, uncanned salmon to the United States.[56]

TABLE 3-10

PERCENTAGE OF TOTAL PROVINCIAL PRODUCTION PUT UP IN EACH CANNING DISTRICT, 1903-1927

Year	F.R.	S.R.	R.I.	S.I.	N.R.	Q.C.I.	V.I.	O.D.
1903	50	21	15	1	4		3	7
1904	28	33	20	2	6		4	7
1905	73	10	7		3		3	4
1906	36	26	20		5		6	7
1907	30	29	17		6			18
1908	16	38	14		9			22
1909	59	14	9		4			13
1910	29	29	17		5			19
1911	32	27	11		7			24
1912	18	26	14		7			36
1913	54	12	5		4			25
1914	30	21	10		8			31
1915	26	25	13		9			28
1916	11	22	9		13		15	31
1917	24	19	6		8		24	19
1918	13	23	6		9		24	24
1919	11	29	6		7		20	27
1920	11	28	13		7		7	33
1921	17	39	10		9		12	13
1922	11	37	6		10		15	22
1923	17	25	10		7		14	26
1924	12	22	7		8	11	16	23
1925	16	20	13		5	5	16	26
1926	13	20	5	1	4	18	17	22
1927	21	14	5	2	3	8	28	20

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1904-1927).

NOTE: From 1907 through 1915 the provincial pack statistics listed production from Vancouver Island, the Queen Charlotte Islands, and the Outlying District under the heading of Outlying Districts. Vancouver Island production began to be listed separately in 1916, Queen Charlotte Island production in 1924. From 1905 through 1925 the Smith Inlet (S.I) pack was included in that from Rivers Inlet.

Vancouver Island production includes sockeye packed in Victoria area canneries, but listed under Fraser River totals in the provincial pack statistics.

TABLE 3-11

PRODUCTION FROM VANCOUVER ISLAND, QUEEN CHARLOTTE ISLANDS, AND THE OUTLYING DISTRICTS (COMBINED) BY SPECIES (48 LB. CASES)

Year	Sockeye	Spring	Steelhead & Blueback	Coho	Pink	Chum
1907	40,159 (41)*	9,977 (10)	2	25,754 (26)	23,300 (24)	
1908	59,815 (49)	9,160 (8)	36	29,781 (24)	23,538 (19)	
1909	93,019 (73)	2,196 (2)		19,911 (16)	12,848 (10)	
1910	87,893 (59)	7,439 (5)		26,636 (18)	20,098 (14)	5,834 (4)
1911	67,866 (30)	12,659 (6)		42,457 (19)	64,312 (28)	39,167 (17)
1912	94,559 (26)	25,491 (7)		73,422 (20)	128,296 (36)	37,770 (11)
1913	149,336 (44)	7,246 (2)		32,695 (10)	94,233 (28)	52,758 (16)
1914	99,830 (29)	10,152 (3)		48,119 (14)	112,145 (33)	70,827 (21)
1915	100,750 (32)	19,188 (6)	985	58,366 (19)	93,376 (30)	41,229 (13)
1916	50,125 (11)	20,213 (4)	712	77,181 (17)	143,615 (32)	161,552 (36)
1917	67,091 (10)	25,565 (4)	3,781 (1)	61,934 (9)	161,365 (24)	352,745 (52)
1918	61,071 (8)	38,907 (5)	5,222 (1)	83,063 (11)	258,882 (33)	341,730 (43)
1919	70,355 (11)	50,779 (8)	9,412 (1)	79,920 (12)	153,486 (23)	293,730 (45)
1920	75,261 (16)	44,844 (9)	4,156 (1)	54,362 (11)	261,540 (54)	43,537 (9)

TABLE 3-11--Continued

Year	Sockeye	Spring	Steelhead & Blueback	Coho	Pink	Chum
1921	29,017 (19)	8,225 (5)	5,941 (4)	29,323 (19)	25,478 (17)	55,843 (36)
1922	65,342 (14)	5,874 (1)	5,904 (1)	49,906 (11)	150,767 (32)	188,963 (40)
1923	38,822 (7)	2,849 (1)	7,829 (1)	50,484 (9)	177,092 (32)	269,247 (49)
1924	56,632 (6)	4,528 (1)	3,007	58,892 (7)	356,656 (40)	402,297 (46)
1925	68,581 (9)	10,666 (1)	6,352 (1)	100,016 (13)	172,131 (22)	432,776 (55)
1926	71,623 (6)	8,872 (1)	6,385 (1)	98,734 (8)	466,356 (40)	523,065 (45)
1927	67,023 (9)	14,246 (2)	11,159 (1)	103,277 (14)	88,310 (12)	469,895 (62)

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1908-1927).

NOTE: Includes salmon packed in Victoria area canneries but credited to the Fraser River totals in the provincial pack statistics.

*Percentage of the total production of the three canning districts for that year.

Although most canneries built after 1911 targeted the lesser species almost exclusively, plants in all of the province's canning districts put up more of these fish. Promotion of canned salmon as a valuable food had expanded existing markets and opened new ones, and the growing demand for canned salmon far outstripped the ability of canners to meet it with sockeye.[57] In one year, 1910 to 1911, the number of pinks

packed in British Columbia salmon canneries jumped from 34,613 to 305,247 cases, and rose to over half a million cases by 1918. The size of the chum pack increased almost as rapidly. When added together, the pack of the lesser species exceeded the sockeye pack for the first time in 1911, and, except in 1913, the last of the Fraser's big years, did so in each successive year. After 1915 sockeye rarely accounted for a quarter of the total pack (Table 3-7 and Table 3-12). Sockeye did, however, retain its position as the most valuable fish. Although consumers, at least those in the "less discriminating markets," were beginning to accept the lighter coloured and less oily pink and chum salmon, they continued to consider them as "cheap fish." Market prices for sockeye were always higher than those of any of the other species, and in some years the total value of the annual pack declined in spite of increased size because cheaper fish made up a greater percentage of the fish canned.[58]

The proliferation of new canneries after 1911 and the increase in the total provincial production of canned salmon heightened concern over the economic health and efficiency of the salmon canning industry, and the danger of over harvesting. Much of this concern surfaced in criticism aimed at the Dominion government for its decision in 1912 to relax fishery regulations prohibiting the construction of new salmon canneries. The established canning companies, through the British Columbia Salmon Canners Association, repeatedly petitioned both the Dominion and Provincial governments to stop issuing new cannery licences. Existing canneries, they argued, were already capable

TABLE 3-12

PERCENTAGE OF PROVINCIAL PRODUCTION MADE UP BY EACH SPECIES, 1903-1927

Year	Sockeye	Spring	Blueback	Coho	Pink	Chum
1903	78	5		11	6	
1904	69	8		15	8	
1905	93	2		4	1	
1906	73	5		11	11	
1907	57	5		16	22	
1908	65	5		15	14	
1909	87	2		6	5	
1910	74	4		10	5	8
1911	40	5		13	32	10
1912	45	8		17	25	6
1913	72	3		5	14	6
1914	48	4		11	20	17
1915	42	5		13	32	7
1916	22	7	1	19	28	24
1917	22	5	1	10	32	31
1918	17	7	1	12	33	31
1919	27	7	2	13	25	27
1920	30	10	1	9	44	7
1921	27	9	1	19	32	12
1922	23	3	1	8	45	20
1923	25	2	1	8	33	31
1924	21	2		7	38	33
1925	23	4	1	11	26	35
1926	16	3	1	8	37	34
1927	23	4	2	12	18	41

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1908-1927).

of handling more fish than could be caught, and more canneries only worsened the situation by increasing competition for fish, increasing production costs, and increasing pressure on the fish stocks.[59] Yet the Dominion government defended its policy by claiming that all the new plants being built were in remote areas of the province, and that their presence would encourage permanent settlement in those areas by providing seasonal employment to settlers.[60] Furthermore, the construction of canneries in remote locations to harvest the widely scattered salmon runs of smaller coastal streams did not increase competition for fish within the established canning districts. As pressure on the Dominion government for new cannery licences intensified, primarily from cannery managers wishing to open up their own plants or from canning companies wanting to improve their strategic position by opening plants in areas where their competitors were successful,[61] the Department of Fisheries not only began issuing licences more freely, but permitted new plants to be constructed within developed canning districts. This drew condemnation from the Special Fisheries Commission of 1917. The Commission's report accused the government of acting irresponsibly, and in opposition to the public's best interests. It identified these interests as being both environmental and economic, listing as pre-eminent concerns

> 1) The conservation of the supply of salmon at the economic maximum. . . .
>
> 4) The avoidance of waste, or of unprofitable employment of labour and of capital in the fishing industry; since the general public interest is concerned with the efficient use of labour and of capital, just as with the

> conservation of material resources such as the salmon supply.

Instead of managing the fishery judiciously, the Dominion government had allowed overcapitalization and overcapacity to develop. The commissioners estimated that in 1916, canneries in the Skeena, Nass, and Rivers Inlet districts could have put up the total pack of the sixty-two day season in just nine days of twelve hours each, or thirteen days of ten hours each, if they had been operated at rated capacity. Although admitting these estimates were based on the canneries operating at maximum capacity, and that such a condition was unrealistic because the characteristics of salmon canning required that canneries be designed to handle peak periods of the run, the commissioners still concluded that overcapacity did not arise from designing canneries to meet the exceptional conditions, but from too many canneries operating. Based on this finding the Commission's report recommended that the Dominion government introduce stricter fishery regulations to eliminate the inefficient use of capital and labour in the salmon canning industry.[62]

Disregarding the recommendations of its own Commission the Dominion government withdrew all restrictions on the construction of new canneries in 1918. This action incensed William Sloan, British Columbia's Fisheries Commissioner. In his Annual Report for 1919, Sloan wrote a scathing indictment of the salmon canners and the Dominion Department of Fisheries, charging the canners with building too many canneries and employing too many fishermen to supply them, and criticizing the

Dominion government for allowing them to do so. Both parties were irresponsible, acting with complete disregard for the economic well-being of the industry and the conservation of salmon stocks. He called for "a complete and radical change" in Dominion fisheries regulation "to seriously protect the fish, eliminate all useless competition, overequipment, and waste," and suggested a government takeover of the provincial fisheries as the most effective way to achieve this.[63] Conveniently, Sloan neglected to mention that the province's "Cannery Revenue Act" gave the provincial fisheries minister the right to block the construction of new salmon canneries, but this right had never been exercised, nor had any of the licences issued by the Dominion government after 1911 ever been challenged.[64]

By the end of the 1920 season, the worst fears of canners and industry observers were realized: excessive wartime and post-war production, wartime and post-war inflation, a sharp reduction in demand, and declining prices combined to throw the canning industry into crisis. During the war canners had spared no effort to put up the largest possible packs. The packs of pinks and chums alone exceeded 970,000 cases in 1917 and over one million cases in 1918. Post-war production of these species remained high, the average combined pack of pinks and chums in 1919 and 1920 was roughly 2.5 times the 1913 pack of these species (Table 3-7). Continental Europe was the traditional market for these fish, but the European market collapsed under the weight of poor foreign exchange rates coupled with a decision by the United States government to dump food (including

canned salmon) in various European countries following the war. Even much lower opening prices for pinks and chums in 1919 and 1920 failed to stimulate markets.[65] Henry Bell-Irving thought there was a consumers' strike:

> Consumers appear to be on strike; there is a rebellion of the consuming public against high prices; it means nothing to the consumer what the goods have cost the producer, he simply won't buy; . . .

As of December 15, 1920, an estimated 4,000,000 cases of canned salmon remained unsold, three million of which were pinks and chums.[66] To help clear this carry-over the British Columbia Salmon Canners Association recommended that the packing of these species in 1921 should be curtailed as much as possible, and that canners take united action to reduce production costs by eliminating competition between companies for fish and by driving down labour costs. The membership accepted each of the proposed recommendations, yet despite a common desire to limit competition and reduce costs, canners refused to post a bond to ensure compliance with the operating agreement.[67] Enforcement of the agreement, therefore, was impossible. Although the industry successfully cut back production in 1921, slow sales and dropping prices continued through 1923. Many of the smaller firms, unable to weather a prolonged period of large carry-overs and low prices, went bankrupt, their assets taken over by larger, or more financially solvent companies. The Canadian Fishing Company (Canfisco) was active during this period, establishing itself as a major concern in the province's salmon canning industry. With only one cannery in 1921, the Home Plant

located on Vancouver's waterfront, Canfisco rapidly expanded its holdings and in 1926 operated eleven canneries along the coast.[68] A few canneries were closed as a result of company take-overs, but none permanently, and when the canning industry returned to good times in 1924 the number of plants operating again grew.[69] Believing their troubles had passed, fishermen and canners redoubled their efforts to put up the largest packs possible; little attention was paid to cost or consequences. In both 1924 and 1925 the combined pack of pink and chum salmon alone was well over 1,000,000 cases, and total production for these years exceeded the record packs put up in the last years of World War I.

* * * * *

B.C. Packers remained indifferent to much of what happened during the years 1907 to 1925. Although the company quickly adopted modern machinery for use in some of its canneries, it was cautious about becoming involved in the new purse-seine fishery, deciding to let "others demonstrate [its] practicability first."[70] And when purse-seining became established and profitable, and many of the canning companies in the province began packing large quantities of pinks and chums, B.C. Packers was reluctant to do likewise. Under W.H. Barker's management B.C. Packers stayed away from the lesser species: the company did not construct any new canneries to take advantage of the fishing grounds opened up by purse-seining operations--a Chinese contractor noted that most of the pink and chum salmon

delivered to the company's Bella Coola Cannery were refused by the manager.[71] When approached in 1919 about the take-over of Wallace Fisheries Ltd., Barker realized the acquisition of the Kildonan, Strathcona, and Claxton canneries would strengthen the position of the company, and would have purchased these plants if they could be bought separately, but wanted nothing to do with Wallace's Quatsino or Naden Harbour plants because they were built exclusively to pack pink and chum salmon.[72] Later, after succeeding Barker as President of B.C. Packers, Aemilius Jarvis commented "that Mr. Barker never could see the money in the cheaper grades of fish, which they [Wallace Fisheries] so largely packed . . .."[73] Henry Doyle, who through these years continued to argue that he had been unjustly dismissed as the general manager of B.C. Packers, termed Barker's management as "ultra conservative" and attributed the company's reduced share of the total provincial pack to Barker's reluctance to pack pinks and chums.[74]

Nor did B.C. Packers follow an aggressive acquisitions policy. During the period 1906 through 1925 the company acquired six salmon canneries, three on the Skeena, one on the Nass, and two on Rivers Inlet. These acquisitions only strengthened the company's position in the established fishing districts. No plants were acquired on the Queen Charlotte Islands, on Vancouver Island, or in the Outlying Districts, where almost all the industry's growth was taking place. On the Skeena River, the take-over of the Dominion Cannery in 1909 finally gave B.C. Packers a location from which it could

participate fully in the river's outside fishery. Built on the north shore of Smith Island facing Inverness Passage, the cannery's fishing fleet worked either in the Passage or out into Chatham Sound, off the south-west shore of Smith Island. The Alexandra, acquired one year later, was most likely purchased for its boat-rating, and was closed after the Dominion government eliminated its boat-rating regulations.[75] The company further strengthened it position in the outside fishery by taking over the B.C. Canning Company's Oceanic plant in 1924 (Map 2).

The other canneries taken over were in the Nass River and Rivers Inlet districts. Acquiring the Nass Harbour Cannery in 1912 finally gave B.C. Packers an operating plant on the Nass. Although old, the cannery was in good condition and located in a large, well protected bay off of the main river channel (Map 2); its fishermen used shallow nets to fish the many bars scattered around the river mouth just outside the bay.[76] Until 1916 the Nass was primarily a sockeye river; only small numbers of pinks, chums, and cohos were canned. From 1917 on, however, the size of the sockeye pack declined, and was exceeded in most years by one or more of the lesser species. Under B.C. Packers' ownership Nass Harbour never matched the sockeye pack of some other canneries in the district, and always lagged far behind in putting up the lesser species: in 1920 the cannery packed 1,556 cases of pinks compared with 10,300 cases put up by the Anglo-British Columbia plant, 12,341 cases by Northern B.C. Fisheries, and 15,171 cases packed by the M. DesBrisay & Co.

Wales Island Cannery. The two remaining B.C. Canning Co. properties, the Rivers Inlet and Victoria canneries, rounded out B.C. Packers' acquisitions during this period. Both were located at the head of River's Inlet, although the Victoria plant had been closed since 1902. The company continued operating the Rivers Inlet Cannery, giving it three plants on the inlet (Map 1).

Between 1906 and 1925 B.C. Packers did not consolidate or centralize any of its productive capacity; rather through its acquisitions the company expanded the number of canneries it operated in each of the older canning districts. The only northern plant closed during the period was the Alexandra, a small plant located a kilometre north of the company's much larger (now seven lines) and more modern Balmoral Cannery. On the Fraser River, all of the company's secondary canneries, those operated only during the big years, were phased out of operation: Cleeve Cannery closed after 1909; Anglo-American, Atlas, Colonial, and Dinsmore Island closed following 1913; and Acme, Albion Island, Canadian Pacific, Celtic, and Pacific Coast closed permanently after the expected big year of 1917 did not materialize. Fire destroyed the Currie-McWilliams Cannery in 1920 and the cannery was not rebuilt. Despite closing these plants, B.C. Packers continued to benefit from their locational advantages, converting many of the sites to fish camps for the Imperial Cannery.

If B.C. Packers remained relatively detached from the activity surrounding the canning industry's expansion during

this period, the detachment would not continue. Since 1911, cannery construction had proceeded without any checks, and by 1925 the industry was again overbuilt. In many districts too many canneries competed for a limited number of fish. Some canners recognized this as a symptom of impending troubles, but the salmon runs were good, markets for canned salmon strong, and canners responded by building even more plants. When crisis eventually hit the industry, B.C. Packers would again play a key role in the events that followed.

CHAPTER 4

THE CLOSURE OF CANNERIES, 1926-1931

By 1926 the British Columbian salmon canning industry had recovered from its post World War I recession. In preparing for the upcoming season canners completely abandoned their concerns about economy and spent freely to build, buy, or reopen canneries, and enlarge their fishing fleets. B.C. Packers' acquisition of Wallace Fisheries Limited in the spring of 1926 was part of this expansion. Earlier consolidations (1921-1924) represented attempts by the industry to pull through times of hardship. Such was not the case in the B.C. Packers-Wallace Fisheries merger. The purchase of Wallace gave B.C. Packers seven more canneries, bringing to twenty-three the number of plants operated by the company. Some of the new canneries were located along the west coast of Vancouver Island and in the northern Queen Charlottes. Others were located adjacent to existing company plants in the older canning districts. None were closed.

The industry's preparations, coupled with good salmon runs, produced a record pack in 1926. Markets for canned salmon

were strong and canners expected 1927 to bring continued prosperity. They prepared accordingly, but as happened so often before, their expectations were not met, their prosperity short-lived. When the expected large runs did not materialize most were left with heavy debts. The close of the 1927 season saw many salmon canning companies once again facing financial trouble. Canners realized that although the poor runs were a factor, "excessive capital investment and wasteful competition" were the cause of the industry's problems. As during the financial crisis following 1901, B.C. Packers played a crucial role in bringing the industry out of its economic difficulties. Before the 1928 season opened the company merged with two other major cannery operators, Gosse Packing Company Limited and Millerd Packing Company Limited, in an effort to reduce operating costs and curb competition. These consolidations brought forty-one canneries under B.C. Packers' control; by 1931 twenty-five of these plants had been permanently closed, while two more had been either leased or sold to other canning companies. This chapter relates the events of 1926 through 1931, describes and analyzes the closure of canneries after the 1928 consolidations, and then assesses the impact of these closures on the geography of salmon canning in British Columbia, and on the industry generally. The concluding section provides a summary of the changing geography of the salmon canning industry between 1870 and 1931, and the role played by the British Columbia Packers Limited.

* * * * *

The preparations made by all British Columbia salmon canning companies for the 1926 season signalled a complete recovery from the economic recession that had plagued the industry during the first half of the 1920's. The number of canneries licenced to operate had increased steadily since 1921, and as markets for canned salmon strengthened and prices rose, production grew accordingly. From a low of 600,000 cases in 1921 the provincial pack more than doubled by 1922, reaching almost 1.3 million cases, increased slightly in 1923, and rose to 1.7 million cases in 1924 and 1925. These production increases were expected to continue through 1926 for eight new salmon canneries were built over the winter of 1925-26: four on the Queen Charlotte Islands, two on Vancouver Island, one just south of the Skeena, and one in the vicinity of Rivers Inlet. Companies that had closed some of their plants temporarily during the recession readied them for reopening. The number of salmon canneries receiving Dominion canning licences jumped from sixty-six in 1925 to seventy-nine in 1926,[1] and the number of fishing boats outfitted by canners and independent fishermen increased in proportion. From 1925 to 1926 the number of gill-net licences issued rose by almost 600, from 4,226 to 4,850; the number of purse-seine licences increased from 329 to 445.[2] Increased expenditure on canneries and fishing equipment pushed total capital investment in the British Columbia fishery from $21,674,584 in 1925 to $31,862,753 in 1926--an increase of over $10 million in one year.[3] As part of this expansion B.C. Packers took over Wallace Fisheries Limited.[4] This gave B.C.

Packers its first canneries on the Queen Charlotte Islands, the west coast of Vancouver Island, and on Smith Inlet; however, the other canneries acquired were located near other company plants in the older canning districts. B.C. Packers closed none of its plants. The company even built a new cannery, the South Bay plant, on the Queen Charlotte Islands. When the season opened, the competition between canners for fish was fierce. Prices paid to fishermen for their catch rose well above those set prior to the season by the canners association.[5] The season's production was the largest pack up to that time, slightly over 2 million cases, made up mostly of pinks and chums.

Preparations for 1927 resembled the frenzied activity of the previous year. Although the total number of canneries licenced declined by four, the Dominion Department of Fisheries recorded seven new canneries under construction.[6] As in 1926, more fishing gear was put into use--the number of gill-net licences increased by almost 800; the number of purse-seines by 107.[7] All canners prepared to put up large packs. Many, particularly the larger companies that had more money invested in fishing and canning equipment, stretched their credit limits to do so.[8] The 1927 season proved disastrous for these firms. The large runs of pink salmon expected in southern waters did not appear,[9] and drastic conservation measures introduced to ensure that enough salmon reached the spawning grounds compounded the problem. The small numbers of fish returning to the rivers, and the large number of boats waiting for them when they arrived, forced Dominion fisheries officers to extend the

weekly closed periods in all fishing areas, and, as a further precaution, to completely close each fishery for at least seven consecutive days during the height of the run. These extended closures kept the large, expensive, already under utilized fishing fleets tied up idle alongside the cannery wharves.[10] Except for 1921, when canners purposely cut back their packing of pink salmon, British Columbia canneries put up fewer pinks in 1927 than in any year since the beginning of World War I. The sockeye runs were also disappointing, the lowest pack for that species since 1922. Total production in 1927 fell to 1.36 million cases. The industry's losses for the season were estimated to be in the neighbourhood of $2,000,000.[11]

Although the poor run of 1927 contributed to the industry's difficulties, everyone involved agreed that too many canneries, too many fishing boats, and wasteful competition were the root causes. Taken together they drove up production costs, eliminated profits, and threatened to deplete the salmon stocks.[12] The short pack had accentuated the problem. In response to this situation a delegation of salmon canners, fishermen, and fisheries officials travelled to Ottawa in October of 1927 to urge the Minister of Marine and Fisheries to introduce more restrictive fishery regulations for 1928. Specifically, the canners' representatives asked the Minister to divide provincial waters into fishing areas, regulate the number of boats, gill-nets, and purse-seines that could be used in each area, and, with certain exceptions (troll caught salmon, or fish destined for export, the fresh market, or cold storage) require

that all salmon be canned in the area in which they were caught. No action was taken on these requests. Instead, the Minister told canners they had "within their own hands" the means to regulate the amount of fishing gear used, and should do so through operating agreements.[13] The 1928 fishery regulations did, however, divide the west coast into twenty-seven areas to allow more localized application of regulations, and assigned guidelines for the number of fishing licences to be issued for each area based on a 48 hour weekly closed period. If the number of licences issued for any area exceeded this figure, the local fisheries officer would lengthen the close period accordingly.[14]

Perhaps anticipating this type of response, canners struck their own committee to investigate ways the industry could limit the amount of fishing equipment used.[15] The resulting agreement, intended to be in force for five years (1928-1932 inclusive), divided coastal waters into seventeen fishing areas, determined the total number of nets to be fished in each area (gear covered in the agreement included gill-nets, beach seines, and purse-seines), and allocated to each company operating a cannery within each area a share of that total. Only companies having a cannery within an area would be allowed to fish there. The agreement also committed canners not to issue any bonuses to fishermen, and to charge a "fair and adequate sum" for any services or equipment provided to fishermen.[16]

The agreement addressed three of the major concerns facing the industry. First, limiting fishing gear and allocating the

maximum amount of gear each company could use arrested the continually increasing amount of gear being put out, and slowed the escalating costs of production. Second, the agreement provided a means to lessen competition between canneries for a share of particular salmon runs, which in turn lessened pressure on the salmon stocks. This point gained increased importance when the Department of Fisheries introduced graduated closed periods, the length of closures for each area dependent on the amount of gear used.[17] Third, by specifying a fishing area for each cannery the larger canning companies hoped to curtail the practice of catching salmon in one district and then transferring it to another for canning. This practice not only placed greater pressure on particular salmon runs, which in many cases could only support one profitable cannery, but required tendering the fish longer distances, with increased risk of spoilage or deterioration en route. Carried fish, as this salmon was called, often produced a pack with a greater percentage of "stale and tainted cans of soft fish, and none of it equal in condition and flavour to salmon packed right on the fish grounds where salmon are caught."[18] Carried fish tarnished British Columbia's reputation for good quality salmon, weakening its position in the export markets where the industry faced strong competition from Japanese and Siberian canners.[19]

Canners also responded to the crisis of 1927 by reducing the number of operating canneries through company consolidations and plant closures. The problem of too many canneries, excessive competition, and duplication of effort had apparently

plagued canners in Washington and Alaska for a number of large mergers were rumoured to be under consideration about the beginning of 1928.[20] In British Columbia the companies most likely to consolidate operations were the province's largest, B.C. Packers and Gosse Packing (B.C. Packers owned 23 salmon canneries, Gosse owned 12). Although all British Columbia's salmon canning companies were financially hurt by the 1927 season, B.C. Packers and Gosse Packing were particularly affected. Each had entered 1927 with a heavy debt load carried over from a costly expansion program begun in 1926. In addition to acquiring Wallace Fisheries, B.C. Packers had built two new salmon canneries, the South Bay Cannery in 1926, and the large Walker Lake Cannery, located in the northern outlying districts, in 1927. Gosse Packing had also been active in 1926, building a six line cannery at Shannon Bay on the Queen Charlotte Islands, the smaller Boswell Cannery on Smith Inlet (immediately south of Rivers Inlet), and adding a single canning line to its fish reduction plant at Hecate, on the west coast of Vancouver Island. The company had also purchased the recently constructed Captain Cove Cannery, located south of the Skeena River estuary, just before the 1926 season began.[21] The costly preparations for 1927, necessary if both companies hoped to maintain their share of the catch, further compounded their debt problems; the small pack left both companies with losses much larger than other provincial canners. Gosse reportedly lost $170,237 on 1927 operations, B.C. Packers $285,750.72.[22] But Aemilius Jarvis confided to Henry Doyle that his company's losses for the

year were much higher. Jarvis placed operating losses, including those involving Wallace Fisheries, at slightly over $300,000. When the writing off of inventories was included, the year's losses jumped to $466,000, or $1.14 for each case of salmon the company packed.[23] A consolidation was attractive to both companies. Both recognized that duplication of effort in fishing and canning operations had only contributed to their poor showing in 1927, and hindered any chances of recovery. An amalgamation would eliminate duplication, reduce operating costs, and lower overhead expenses.[24] After negotiating during the off season, the two companies officially merged under the name of British Columbia Packers Limited on May 18, 1928. By month's end the new company had acquired the assets of the Millerd Packing Company Limited.[25]

The consolidation of the three companies gave B.C. Packers forty-one operating salmon canneries: five on the Fraser River, two on the Nass, seven on both the Skeena River and Rivers Inlet, five on the Queen Charlotte Islands, seven on Vancouver Island, and eight scattered about the outlying districts (Table 4-1). The company immediately closed seven of these plants to streamline its operations for 1928; all were located near to other plants kept operating. Beginning in the north, B.C. Packers closed its Nass Harbour Cannery, located on the opposite shore of the Nass River from the Mill Bay plant. On the Skeena the Dominion Cannery, across Inverness Passage from the more productive Sunnyside Cannery, was closed, as was the small, recently built Captain Cove Cannery. B.C. Packers closed the

TABLE 4-1

SALMON CANNERIES OPERATED BY B.C. PACKERS
FOLLOWING THE 1928 CONSOLIDATIONS

District	Cannery Name	Built	Closed	From
FR	Terra Nova	1892	1928	B.C. Packers
FR	Brunswick #2	1897	1931	B.C. Packers
FR	Ewen (Lion Is.)	1876	1931	B.C. Packers
FR	Vancouver	1896	1931	Gosse Packing
FR	Imperial	1893		B.C. Packers
NR	Nass Harbour	1881	1928	B.C. Packers
NR	Mill Bay	1878	1937	B.C. Packers
OD	Barnard Cove	1925	sold	Millerd Packing
OD	Kimsquit	1901	1928	Gosse Packing
OD	Walker Lake	1927	1930	B.C. Packers
OD	Bella Bella	1912	1931	Gosse Packing
OD	Laurel Whalen	1924	1931	Millerd Packing
OD	Lowe Inlet	1890	1934	B.C. Packers
OD	Bella Coola	1900	1935	B.C. Packers
OD	Namu	1893	1971	Gosse Packing
QC	Jedway	1926	1929	Millerd Packing
QC	Ferguson Bay	1926	1929	Millerd Packing
QC	South Bay	1926	1931	B.C. Packers
QC	Watun	1920	1931	B.C. Packers
QC	Shannon Bay	1926	1941	Gosse Packing

TABLE 4-1--Continued

District	Cannery Name	Built	Closed	From
RI	Strathcona	1906	1928	B.C. Packers
RI	Brunswick	1897	1931	B.C. Packers
RI	Smith's Inlet	1902	1931	B.C. Packers
RI	McTavish	1917	sold	Gosse Packing
RI	Rivers Inlet	1882	1934	B.C. Packers
RI	Boswell	1926	1936	Gosse Packing
RI	Wadham's	1897	1942	B.C. Packers
SR	Dominion	1906	1928	B.C. Packers
SR	Captain Cove	1926	1928	Gosse Packing
SR	Oceanic	1903	1929	B.C. Packers
SR	Seal Cove	1924	1929	Millerd Packing
SR	Balmoral	1883	1934	B.C. Packers
SR	Claxton	1892	1944	B.C. Packers
SR	Sunnyside	1916	1969	Gosse Packing
VI	San Mateo	1919	1928	Gosse Packing
VI	Sointula	1926	1929	Millerd Packing
VI	Hecate	1926	1931	Gosse Packing
VI	Lummi Bay	1916	1931	Gosse Packing
VI	Quatsino	1911	1931	B.C. Packers
VI	Alert Bay	1881	1941	B.C. Packers
VI	Kildonan	1903	1960	B.C. Packers

Strathcona Cannery on Rivers Inlet, a "first class plant, modern and well equipped,"[26] but located on the main body of the inlet between the company's Brunswick and Wadhams plants. On the west coast of Vancouver Island the San Mateo Cannery, in the vicinity of the large, modern, well-equipped Kildonan plant, was closed. And in the northern outlying district the Kimsquit Cannery, at the head of the Dean Channel, was closed; salmon taken from the channel could be delivered just as easily to the Walker Lake, Bella Bella, or Bella Coola canneries as to Kimsquit. On the Middle Arm of the Fraser River B.C. Packers closed its Terra Nova plant. Terra Nova was located immediately across the channel from the newly acquired Vancouver Cannery, into which Gosse Packing had earlier consolidated the operations of its Star, Burrard, Fraser, and Vancouver canneries. According to Henry Doyle the Vancouver Cannery was a very good operation, and in 1926 had packed nearly twice as many cases of salmon as had all the B.C. Packers' Fraser River canneries combined, despite having less investment in it than B.C. Packers' Imperial Cannery.[27] After closing Terra Nova the company still operated four plants on the Fraser, which accounted for almost half the canneries putting up salmon on the river. In addition to the closures B.C. Packers sold its Barnard Cove Cannery, located in the outlying districts between the Skeena River and Rivers Inlet, to the Canadian Fishing Company; and leased its Boswell Cannery on Smith Inlet to the Anglo-British Columbia Packing Company.

In 1929 B.C. Packers closed five more canneries. As in the previous year, all the plants closed were located close to other canneries. Two of the plants closed were on the Queen Charlotte Islands, both had been recently built by Francis Millerd of the Millerd Packing Company. The Ferguson Bay Cannery was located on the south shore of Masset Inlet, a short distance east of the larger, six-line Shannon Bay Cannery. Since both these canneries were built to harvest the large runs of pink salmon that returned to the inlet every second year, the smaller cannery was redundant and was shut down. Little is known about the Jedway plant, the other cannery closed. Millerd built the cannery at the south end of Morsby Island, the only cannery ever built so far south, but B.C. Packers own South Bay Cannery, on the south side of Skidegate Inlet, was centrally located and easily able to receive salmon caught on the fishing grounds surrounding Jedway. Two canneries were also closed on the Skeena: the Oceanic, facing south onto Marcus Passage just west of the company's much larger and more modern Claxton Cannery, a plant Doyle continued to describe as the best cannery location on the Skeena River;[28] and the Seal Cove plant, another Millerd cannery, located north of Prince Rupert harbour, well removed from the main river channel. The fourth Millerd Cannery closed in 1929, also recently built, was the Sointula Cannery on Malcolm Island, just north of B.C. Packers' Alert Bay plant.

B.C. Packers did not close any of its canneries in 1930, although in December, 1929, fire destroyed the company's four-line Walker Lake Cannery built only two years before. The

company did not rebuild the cannery, and did not need to. B.C. Packers owned each of the other two salmon canneries located within the same fishing area as Walker Lake (as delineated in the 1928 agreement), enabling the company to maintain its presence in the district. The company, however, did install a modern ice making plant on the old cannery site, which remained operational until cold storage facilities were installed in the Namu plant about 1940. Now able to supply both fishermen and tenderboats with crushed ice, the former Walker Lake site was probably used as a fish collection station, with the salmon being tendered either to Bella Bella or Namu for packing.

By 1931 B.C. Packers began feeling the effects of the world-wide depression. The previous season, 1930, had produced a record pack of over 2.2 million cases, mostly pinks but almost half a million cases of sockeye, easily the largest pack of that species since 1915. B.C. Packers alone put up over 1 million cases, roughly 47 percent of the provincial total. But economic conditions had drastically reduced the selling price of canned salmon and the company lost $1,266,038.38 on the season's operations.[29] For the upcoming 1931 season B.C. Packers, along with most Pacific coast salmon canners, decided to curtail production to reduce costs.[30] As a consequence the company permanently closed twelve canneries; six others were closed temporarily. On the Fraser River the Vancouver (middle arm), Brunswick #2 (Canoe Pass), and Ewen (up river) canneries were closed, leaving Imperial (Steveston) as the only company plant on the river. In the Rivers Inlet area the Brunswick Cannery on

the main channel of Rivers Inlet was shut down, as was the Smith Inlet Cannery to the south. Other closures in the north were the Bella Bella Cannery in the outlying districts, South Bay and Watun on the Queen Charlotte Islands, and three canneries along the west coast of Vancouver Island, Quatsino in the north, Hecate in the central area, and Lummi Bay in the south. The Laurel Whalen, a floating cannery, was also dismantled. Closed for the season were the Mill Bay (Nass), Balmoral (Skeena), Lowe Inlet (northern outlying district), Shannon Bay (Queen Charlotte Islands), Alert Bay (Vancouver Island), and Rivers Inlet canneries.[31]

With the closures of 1931 B.C. Packers' program to rationalize production was completed. In four years the company had either closed or sold twenty-seven of its forty-one salmon canneries, concentrating its operations in the remaining fourteen. These closures were not random. The fact that raw salmon still could not be carried long distances before processing without a high degree of spoilage en route precluded any inter-district centralization of production.[32] The restrictions set out in the 1928 Agreement show that responsible salmon canners recognized that their best interests were served by confining their fishing fleets to the waters in the vicinity of their canneries. To this end B.C. Packers continued to operate one cannery, often more, in each of the province's canning districts, using its plants to maintain maximum coverage of the fishing areas. The company kept open the old Mill Bay Cannery on the Nass River; the Balmoral (up river, across from

Port Essington), Claxton (outside of the river mouth), and Sunnyside (located on Inverness Passage, now the core area of salmon canneries on the river because of the ready access to the Canadian National Railway line) on the Skeena; the Rivers Inlet and Wadhams canneries on Rivers Inlet, the former at the head of the inlet the latter near the mouth; the Boswell Cannery on Smith Inlet; the Shannon Bay plant on the Queen Charlotte Islands; and the Kildonan Cannery on the west coast of Vancouver Island. In 1933, 1940, and 1941 the Alert Bay Cannery also packed. In the outlying districts B.C. Packers kept three plants operating: Lowe Inlet, on Grenville Channel roughly seventy kilometres south of the Skeena River estuary; Bella Coola, at the head of North Bentinck Arm; and Namu, north of the entrance to Rivers Inlet. On the Fraser River, only the Imperial Cannery at Steveston remained open (Maps 1 and 2). Most of the canneries closed were converted to fishing camps, where fishermen not only delivered their catch, but were able to take on fuel, ice, food, and other supplies. Together, the camps and canneries gave B.C. Packers the most extensive coverage of the main fishing areas of any canning company operating in the province.

By closing twenty-five of its forty-one canneries B.C. Packers did much to reduce the excessive investment and competition that had crippled the British Columbian salmon canning industry in 1927. These closures, especially those in 1931, probably account for most of the dramatic drop in capital invested in the British Columbian fishery--from $37,661,577 in

1930 to $20,750,316 in 1931.[33] Coupled with the agreement between canners to limit gear they reduced the amount of fishing nets put out, particularly the number of purse-seines.[34] However helpful to the industry generally, the closures were not enough to reverse B.C. Packers' own deteriorating economic position, or to deflect the adverse impacts of the depression. In spite of good sockeye packs in 1930 and 1932, worsening economic conditions world-wide and sizable packs in other canning areas continued to drive down export prices for canned salmon. Opening prices for sockeye dropped roughly $5 a case from 1929 through 1932, with less dramatic price reductions for the other species.[35] B.C. Packers depended solely on its salmon canning operations for revenue, and by 1933 the company verged on bankruptcy. Only through creditor cooperation, internal reorganization, and a capital restructuring plan that wiped out a $4,000,000 deficit, was the company able to avoid insolvency.[36]

* * * * *

By the mid 1920's the geography of salmon canning in British Columbia had evolved through two stages, each reflecting the technologies available to the industry, and the markets for canned salmon. From 1870 to 1901 sockeye salmon was the only species targeted. These fish were easily caught using either relatively inexpensive skiffs and gill-nets, or beach seines. Small, single line, predominantly manual canneries were able to pack all the salmon caught and delivered to the cannery wharf

each day. This kept entry costs low. Easy financing, and the inability to transport raw salmon any appreciable distance before processing resulted in large numbers of these plants clustering in the estuaries of rivers that supported sizable sockeye runs: by 1900 five canneries had been built on the Nass River, eleven on the Skeena, seven on or near Rivers Inlet, and at least fifty-six on the Fraser River. Where the runs were much smaller only one cannery operated, and a handful of such canneries were scattered about the coast outside of the main districts.

Declining sockeye runs to the Fraser River initiated changes to this pattern. Canners on the river began packing greater numbers of the other species of salmon--cohos, pinks, and chums--they also began shifting their attention to the northern districts. A few canners built new plants there, most were within the established areas, and most northern canneries continued targeting sockeye. As markets for canned salmon expanded, canners met the demand for their product by targeting the other species in all districts. When demand continued to out pace supply, they sought rivers and streams outside of the established districts that supported runs of these fish. The introduction of gasoline engines on fishing boats made purse-seining a practical, inexpensive method of catching large volumes of pink and chum salmon, and opened up these fishing grounds; inside the canneries the introduction of automatic butchering machines, sanitary cans, and other mechanized processes greatly increased the speed of the canning lines, and

enabled canners to pack large numbers of the less valuable fish quickly, and at a lower cost. Canners, still unable to tender raw fish long distances, built new plants to harvest these grounds. Between 1911 and 1925 thirty-three of the forty-six salmon canneries built were located outside of the older, previously established sockeye districts. By 1926 the industry had reached its most dispersed state. In that year seventy-nine canneries were licenced to operate, and they were spread along the entire provincial coastline.

Each period of expansion ended abruptly. The lack of any barriers to entering the industry led to over-investment, excess canning capacity, and unrestrained competition; over-production, a drop in the market price for canned salmon, or failure of the salmon runs inevitably toppled the industry into economic crisis.[37] Salmon canners were aware of these hazards and their consequences, and tried to prevent them, or at least lessen their impact, by signing operating agreements prior to each canning season. Such agreements, designed to restrict competition, reduce production costs, and to a limited extent fix prices, were a common business practice in Canada during the late nineteenth and early twentieth centuries, especially when a growing number of participants or excessive capacity in an industry threatened, or was perceived to threaten, profitability.[38] Although agreements of this kind might violate Canadian anti-combine legislation, the Dominion government appeared content with monitoring the agreements rather than prosecuting the participants. But operating agreements were

inherently unstable. The number of participants involved made them difficult to arrive at, almost impossible to enforce, and once signed, offered the possibility of a competitive advantage to anyone adopting the banned practices, even when doing so was sure to disrupt the industry. Seldom did they achieve their objectives. In the salmon canning industry their success was marginal at best, and such agreements were unable to avert or solve the problems facing the industry at the end of 1901 and 1927.

The British Columbia Packers Limited represented another solution. Producers often turned to more formal arrangements --consolidations--after operating agreements failed. Most of these were horizontal mergers, organized to reduce competition, eliminate excessive productive capacity, and, hopefully, gain greater control of marketing. Washington State and Alaskan salmon canners had used such consolidations to resolve problems of overexpansion in their industries, and the formation of B.C. Packers in 1902 followed their example. In 1902 the new company consolidated the operations of thirty-three small salmon canning companies, and by 1906 had closed twenty-eight of the forty canneries taken over (this included the secondary plants on the Fraser River, which operated only in the years of the big run). Between 1926 and 1928 B.C. Packers merged its operations with those of three other large canning companies, owned forty-one plants in 1928, and had closed, sold, or leased twenty-seven of them by 1931. Each of these consolidations helped pull the provincial canning industry out of its difficulties by

eliminating excess packing capacity and reducing competition for fish.

Neither consolidation proved successful for B.C. Packers. The price paid by the company to eliminate capacity following the 1902 merger was high: the costs of renovating and expanding the canneries kept open was much greater than originally estimated, and, as a consequence of closing so many plants the company's percentage of the provincial pack fell steadily, from 44 percent in 1902 to 25 percent by 1906. As new companies entered the industry, and others expanded their holdings, B.C. Packers' percentage continued to drop. By 1918, when wartime production peaked, the company accounted for only 16 percent of the pack. This increased slightly during the post war recession, when many smaller companies were forced to close their plants, but by 1926 the industry had recovered and B.C. Packers' share had again fallen to 16 percent (Table 4-2). Following the 1928 consolidation the company fared even poorer. The cost of executing the consolidation was high, and B.C. Packers took on a heavy debt to complete it. With the onset of the depression in 1929, this debt became intolerable. A sharp drop in the wholesale price of canned salmon in the early 1930's sharpened the company's financial problems, and by 1933 B.C. Packers faced bankruptcy.

Despite the large number of canneries closed following the consolidations of 1902 and 1928, neither consolidation fundamentally altered the geography of salmon canning along the coast. B.C. Packers did concentrate its canning operations into

TABLE 4-2

B.C. PACKERS' PERCENTAGE OF PROVINCIAL CANNED SALMON PRODUCTION

Year	B.C. Packers' Production	Provincial Production	B.C. Packers' Percentage
1902	273,783	625,982	44
1903	192,056	473,674	41
1904	164,696	465,894	35
1905	435,501	1,167,460	37
1906	159,546	629,460	25
1907	139,805	547,459	26
1908	139,935	542,689	26
1909	292,578	967,920	30
1910	204,272	762,201	27
1911	237,413	948,965	25
1912	243,492	996,576	24
1913	399,467	1,353,901	30
1914	280,476	1,111,039	25
1915	286,104	1,133,381	25
1916	193,946	995,065	20
1917	281,900	1,557,485	18
1918	262,403	1,616,157	16
1919	233,234	1,393,156	17
1920	238,469	1,187,616	20
1921	166,294	603,548	28
1922	201,826	1,290,336	16
1923	230,597	1,341,677	17

TABLE 4-2--Continued

Year	B.C. Packers' Production	Provincial Production	B.C. Packers' Percentage
1924			
1925	288,292	1,719,282	17
1926	337,326	2,065,190	16
1927	407,774	1,360,364	30
1928	964,618	2,035,629	47
1929	667,238	1,398,770	48
1930	1,039,056	2,221,819	47
1934	447,323	1,583,836	28

SOURCE: British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries (1902-1934).

NOTE: Individual company totals were not published in 1924.

fewer, advantageously located plants, but the inability to tender fish long distances prevented any inter-district centralization of salmon canneries. Centralization of salmon canneries eventually occurred, but years later. During the period covered in this study, technological limitations--slow tenderboats and inadequate refrigeration techniques--demanded that canners continue to operate plants in all areas of the coast if they were to take full advantage of the province's salmon resources.

NOTES

PREFACE

1. The company's name changed a number of times between 1902 and 1928. The original name (1902) was the British Columbia Packers Association of New Jersey. This was shortened to the British Columbia Packers Association in 1910, when the company was re-incorporated under a provincial charter. Concern over whether a provincially chartered company had the right to do business outside of provincial boundaries led to the incorporation of the British Columbia Fishing & Packing Company Limited under a Dominion charter in 1914. The new company acted as a holding company; the operating company remained British Columbia Packers Association. Late in 1920 the two companies were merged (the holding company buying out the operating company) under the name British Columbia Fishing & Packing Company Limited, which remained the name until the consolidation with Gosse Packing Company in May, 1928, when the company was re-incorporated under its present name, the British Columbia Packers Limited. This thesis uses the name B.C. Packers throughout. "History of the British Columbia Packers, Ltd.," Western Fisheries 12 (June 1936): 12-13; and Cicely Lyons, Salmon, Our Heritage: The Story of a Province and an Industry (Vancouver: Mitchell Press Ltd., 1969), pp. 232-33, pp. 238-41, p. 348, and pp. 373-74.

Chapter 1: FOCUSED EXPANSION, 1870-1901

1. Robert A.J. McDonald, "Victoria, Vancouver, and the Economic Development of British Columbia, 1886-1914," in British Columbia: Historical Readings, ed. W. Peter Ward and Robert A.J. McDonald (Vancouver: Douglas & McIntyre Ltd., 1981), p. 371; see also Research Department, Economic Council of British Columbia, "Statistics of Industry in British Columbia, 1871-1934" (Victoria: 1935).

(Typescript.) Tables T3-T8 (hereafter cited as "Statistics of Industry in British Columbia").

2. For a discussion of the Hapgood and Hume canning operation see Henry Doyle, "Rise & Decline of the Pacific Salmon Fisheries," University of British Columbia Library, Special Collections Division, Vancouver, British Columbia (hereafter cited as UBC Special Collections), pp. 30-43. The amount of salmon packed varies between sources. Other figures mention 400 cases. Robert J. Browning, Fisheries of the North Pacific: History, Species, Gear and Processes (Anchorage: N.W. Publishing Co.), p. 52.

3. Harry Keith Ralston, "The 1900 Strike of Fraser River Sockeye Fishermen" (M.A. Thesis, University of British Columbia, 1965), p. 16; William M. Ross, "Salmon Cannery Distribution on the Nass and Skeena Rivers of British Columbia, 1877-1926" (Graduating Essay, University of British Columbia, 1967), p. 31.

4. Ross, p. 31.

5. Lyons, pp. 149-50; Hugh W. McKervill, The Salmon People: The Story of Canada's West Coast Salmon Fishing Industry (Sidney, B.C.: Gray's Publishing Ltd., 1967), pp. 128-32.

6. Although based on the most current information, the figures for the Fraser River are tentative. Changes in ownership, leasing of plants, and succeeding operations were more complex on the Fraser than in the other canning districts, and requires further study. The figures given here are conservative estimates. Arthur Roberts, Diane Newell, and Edward Higginbottom, "SFU/UBC Inventory of Historic Salmon Cannery Sites," 8 Vols. (Department of Geography, Simon Fraser University). (Typescript.)

7. Keith Ralston, "Patterns of Trade and Investment on the Pacific Coast, 1867-1892: The Case of the British Columbia Salmon Canning Industry," in British Columbia: Historical Readings, ed. W. Peter Ward and Robert A.J. McDonald (Vancouver: Douglas & McIntyre Ltd., 1981), pp. 300-2.

8. Canada, Parliament, Sessional Papers Vol. 15, 1882, No. 5, Supplement No. 2, "Report of the Commissioner of Fisheries for the Year Ended 31 December, 1881," p. 223 (hereafter cited as "Annual Report"); Ralston, "Patterns of Trade," pp. 300-1.

9. The five species of Pacific salmon common to British Columbian waters are Sockeye, Spring (sometimes called Chinook or King salmon), Coho, Pink, and Chum. For short descriptions of their physical characteristics and habits see Lyons, Appendix 3, pp. 638-42; or Otis W. Freeman,

"Salmon Industry of the Pacific Coast," Economic Geography 11 (April 1925): 109-12.

10. Ralston, "Patterns of Trade," p. 298; Homer E. Gregory and Kathleen Barnes, North Pacific Fisheries, Studies of the Pacific, no. 3 (New York: American Council, Institute of Pacific Relations, 1939), pp. 7-9.

11. Ross, pp. 13-30; and John N. Cobb, Canning of Fisheries Products (Seattle: Miller Freeman, 1919), pp. 1-6. Cobb's book was written as a guide for cannery operators. His connections with the fishing industry up to 1919 included operating a cannery, serving as editor of the Pacific Fisherman, and acting as a Field Agent for the United States Bureau of Fisheries.

12. "B.C. Packers Cannery Report, November 1902," Henry Doyle Papers, Box 11, File 12, UBC Special Collections (hereafter cited as "Cannery Report").

13. "Cannery Report."

14. Ross, p. 20; "Cannery Report."

15. Joan Skogan, Skeena: A River Remembered (Cloverdale, B.C.: D.W. Friesen & Sons Ltd., 1983), p. 36.

16. Joseph E. Forester and Anne D. Forester, Fishing: British Columbia's Commercial Fishing History (Saanichton, B.C.: Hancock House Publishers Ltd., 1975), p. 118.

17. Dominion fisheries regulations prohibited canners from using fish traps as early as the 1880's. L. Anders Sandberg argues that canners supported this prohibition because traps were expensive to construct and finance capital was difficult to raise. In the United States, where capital was more readily available, traps became the canner's preferred method of obtaining fish. Evidence does not support this argument. By 1877 one canner operating on the Fraser River had constructed a salmon trap about four miles downstream from New Westminster, and the Dominion Inspector of Fisheries for British Columbia claimed that it was "built by a man of small means, who probably could not afford the purchase of nets." Other canners protested the construction of this trap, only because they thought the practice unlawful; if traps were legal, they would build them. The use of traps to capture salmon was quickly banned. Later, during the late 1890's, British Columbian canners repeatedly asked the Department of Marine and Fisheries to allow the use of traps, claiming that trap caught fish were cheaper than those caught using gill-nets (labour costs would be less), and that the catches were larger and more reliable. These requests were rejected.

Only after American traps began taking a greater share of sockeye destined for the Fraser River did the Department change its policy. In a retaliatory action against the Americans, the Dominion government passed an order-in-council in May of 1904 permitting the construction of salmon traps along the south-west coast of Vancouver Island, south of Discovery Island. The government justified its decision by claiming that most of the fish taken in these traps would only end up in the American traps on Puget Sound, with no benefit coming to British Columbian interests. See Lars Anders Sandberg, "Study in Canadian Political Economy: A Critical Review and the Case of the B.C. Salmon Canning Industry, 1870-1914" (M.A. Thesis, University of Victoria, 1979), pp. 169-74; Canada, Sessional Papers Volume 11, 1878, "Annual Report, 1877," pp. 293-301; British Columbia, Department of Fisheries, Report of the Commissioner of Fisheries, 1902 (Victoria), pp. G7-G9, (hereafter cited as Report); Canada, Dominion-British Columbia Fisheries Commission 1905-1907, Report and Recommendations (Ottawa: Government Printing Bureau, 1908), p. 33; and Lyons, p. 248.

18. The Vancouver Public Library, Historical Photographs Section, Slide Kit 36, "Salmon Cannery Workers of Steveston, 1913," shows a Indian woman working as a puller. Skogan (p. 19) mentions that sometimes the wives or daughters of Indian fishermen worked as boat pullers.

19. John N. Cobb, Pacific Salmon Fisheries, 4th ed., Fisheries Document no. 1092 (Washington: United States Department of Commerce, Bureau of Fisheries, 1930), pp. 477-78; Duncan Stacey, Gulf of Georgia Cannery, Steveston, British Columbia, 1894-1930 (Parks Canada publication made available by the author), pp. 14-16. A slightly less detailed version of the study is available as Sockeye and Tinplate: Technological Change in the Fraser River Canning Industry, 1871-1912 (Victoria: British Columbia Provincial Museum, 1982).

20. British Columbia, Report, 1902, p. G7; Stacey, Gulf of Georgia, p. 19.

21. Stacey, Gulf of Georgia, pp. 24-26.

22. British Columbia, Report, 1902, pp. G28-G32.

23. For a more detailed discussion of the different methods see Cobb, Pacific Salmon Fisheries, pp. 478-79.

24. Lyons, pp. 174-78; "Cannery Report;" Canada, Dominion-British Columbia Boat-Rating Commission, 1910. Report and Recommendations (Ottawa: n.p, n.d).

25. Canada, Sessional Papers Volume 39, 1905, No. 22, "Annual Report, 1904," p. 302.

26. Patrick William O'Bannon, "Technological Change in the Pacific Coast Canned Salmon Industry, 1864-1924" (Ph.D. dissertation, University of California, San Diego, 1983), pp. 79-83.

27. O'Bannon, "Technological Change, 1864-1924," pp. 47-48; Patrick William O'Bannon, "Technological Change in the Pacific Coast Canned Salmon Industry, 1900-1925: A Case Study," Agricultural History 56 (1982): 152.

28. This discussion on the adoption of technologies to 1900 is from Stacey, Gulf of Georgia, pp. 1-12.

29. Stacey, Gulf of Georgia, p. 9; E.E. Prince, "The Pacific Salmon Fisheries of Canada," in Canada, Sessional Papers Vol. 41, 1906-1907, No. 22, "Annual Report, 1906," p. lxii. In 1902 northern canneries were valued about 23 percent lower than canneries on the Fraser because of a "shortage of modern equipment." D.J. Munn & A.P. Larsen (valuators) to Aemilius Jarvis, May 8, 1902, Henry Doyle Papers, Box 11, File 12.

30. Based on pack statistics for 1900 and 1901 in Canada, Sessional Papers Vol. 36, 1902, No. 22, "Annual Report, 1901," p. 175; and Canada, Sessional Papers Vol 37, 1903, No. 22, "Annual Report, 1902," p. 106.

31. Canada, 1905 Commission. Report and Recommendations. The table on p. 22 shows the forty-nine canneries on the Fraser had a total of fifty-two canning lines; therefore, multiple line plants do not account for the high variation in pack sizes.

32. Duncan Stacey, "North Pacific Cannery, Port Edward, British Columbia," unpublished paper prepared for the Historic Sites and Monuments Board of Canada, n.d., p. 12.

33. British Columbia Fire Underwriters Association, Plans of Salmon Canneries in British Columbia Together With Inspection Reports on Each, Insurers Advisory Organization, UBC Special Collections (hereafter cited as "Plans of Salmon Canneries").

34. Gregory and Barnes, p. 32; G. Gordon Strong, "The Salmon Canning Industry in British Columbia" (Graduating Essay, University of British Columbia, 1934), pp. 101-2.

35. Doyle, "Rise and Decline," pp. 54-55, and p. 200.

36. Ross, p. 37; Stacey, Gulf of Georgia, p. 6.

37. O'Bannon, "Technological Change: A Case Study," pp. 152-53; Stacey, Gulf of Georgia, p. 1. In 1877, a crew of about 150 workers could put up 230-500 cases a day; by about 1900 a crew of 84 put up an average of 1,200 cases per day. Stacey, Gulf of Georgia, Table 1, pp. 11-12.

38. O'Bannon, "Technological Change: A Case Study," p. 152.

39. Ross, pp. 47-49.

40. Gregory and Barnes, p. 113.

41. Doyle, "Rise and Decline," pp. 200-202. See Stacey, Gulf of Georgia, Table 2, p. 27 for the capital invested per cannery on the Fraser River in 1881, 1890, and 1905.

42. Ralston, "1900 Strike," pp. 67-68 and pp.170-71; Lyons, p. 226.

43. Doyle, "Rise and Decline," p. 211.

44. Ralston, "1900 Strike," p. 171.

45. Doyle, "Rise and Decline," pp. 211-12. A similar situation would occur in Washington State following the salmon war of 1903, which led to the bankruptcy of the Pacific Packing and Navigation Company. This company, formed through a merger of canning interests in 1901, had purchased the successful Ainsworth & Dunn cannery at Blaine for $325,000. Two years later, after a short but intense price cutting battle with the larger and financially stronger Alaska Packers Association, the new company was bankrupt. At the receiver's sale in 1904, Ainsworth & Dunn were able to repurchase their old cannery for only $75,000. Doyle, "Rise and Decline," p. 240; Browning, p. 53; Gregory and Barnes, pp.94-95.

46. David Reid, The Development of the Fraser River Salmon Canning Industry, 1885-1913, Economics and Sociology Unit, Northern Operations Branch, Fisheries and Marine Services, Pacific Region, Canada, Department of the Environment, NOB/ECON 4-73, July, 1973, p. 31; Ross, pp. 62-66.

47. Henry Doyle, "Report on British Columbia Salmon Industry, December, 5, 1901," Henry Doyle Papers, Box 5, File 7, pp. 1-2; Gregory and Barnes, pp. 92-96; O'Bannon, "Technological Change, 1864-1924," pp. 126-32.

48. Doyle, "Report on B.C. Salmon Industry." Doyle elaborated on each of these points throughout the report, as well as in other correspondence. See Henry Doyle to A.G. Kittson & Co., February, 11, 1902, Henry Doyle Papers, Box 2, File 1.

49. Henry Doyle, "Prospectus: To the Salmon Canners of British Columbia--Private and Confidential," Henry Doyle Papers, Box 11, File 13.

50. Doyle "Report on B.C. Salmon Industry," p. 4; Henry Doyle to A.G. Kittson & Co.

51. Reid, p. 21. Doyle and Jarvis were supposed to have met while travelling on a coastal steamer. Having put in at a number of canneries on the journey, Jarvis expressed a curiosity about the industry that Doyle satisfied. The idea of forming B.C. Packers may have come out of this initial meeting. Lyons pp. 230-231.

52. Following the 1901 season the indebtedness of the province's canners was divided as follows: Bank of Montreal 50%, Bank of Commerce 40%, and Molson's Bank 10%. Lyons pp. 232-233.

Chapter 2: BRITISH COLUMBIA PACKERS AND THE CLOSURE OF SALMON CANNERIES, 1902-1906

1. Ralston, "1900 Strike," pp. 27-31.

2. Stacey, Gulf of Georgia, pp. 16-23.

3. Canada, 1905 Commission. Report and Recommendations, p. 95.

4. Canada, 1905 Commission. Report and Recommendations, p. 75.

5. The number of canneries is taken from the pack statistics given in Canada, Sessional Papers Vol. 37, 1903, No. 22, "Annual Report, 1902," p. 106.

6. Lyons, p. 237.

7. Correspondence, Henry Doyle to various District Managers, Henry Doyle Papers, Box 2, File 2.

8. Rough Notes, Henry Doyle Papers, Box 11, File 12.

9. Correspondence, Henry Doyle to various District Managers, Henry Doyle Papers, Box 2, File 2.

10. Descriptions of the Rivers Inlet fishing grounds are taken from, British Columbia, Report, 1902, pp. G28-G32; throughout Canada, Dominion-British Columbia Fisheries Commission 1905-1907. Evidence (Ottawa: Government Printing Bureau, 1908); and Canada, 1910 Boat-Rating Commission.

11. Canada, 1910 Boat-Rating Commission.

12. "Cannery Report."

13. A.J. Munn & A.P. Larsen (valuators) to Aemilius Jarvis; see also the pack statistics for Rivers Inlet from 1897 through 1901 given in Canada, Sessional Papers (Vols. 33-37), "Annual Report, (1898-1903).

14. "Cannery Report;" Henry Doyle to Aemilius Jarvis, March 7, 1928, Henry Doyle Papers, Box 2, File 14.

15. These are the present day names. During the early years they were called the Slough, Blind Passage, and Middle Passage. See British Columbia, Report, 1902, pp. G32-G34; and "Cannery Report."

16. Ross, pp. 40-43, and pp. 56-59; Canada, 1910 Boat-Rating Commission. Many canneries concentrated their fishing effort in areas adjacent to their canneries. These locations are described in Ross, pp. 27-29.

17. Each site assessment is from the "Cannery Report."

18. Anonymous Letter, Henry Doyle Papers, Box 2, File 2; Rough Notes; Summary of Expenditures Made for Additions & Improvements, 1903, Henry Doyle Papers, Box 11, File 12.

19. Anonymous Letter; Summary of Expenditures Made for Additions and Improvements to Canneries, 1903. The general discussion is based on the "Cannery Report."

20. The organizational structure of the fishermen's union reflected these separate fisheries, as did the fishermen's actions.

> "The districts most affected by the strike were the North and Centre Arms of the river up as far as Eburne, the main channel and Canoe Pass, as far up as Woodward's Slough. Reaches of the river above these points were less affected as far as Westminster Bridge. Above the bridge men did not strike. . . ." British Columbia, Report, 1913, p. R18.

21. Doyle noted that the Columbia River Packers Association Nusagak plant, located in Alaska on the Bering Sea, was unprofitable ". . . due to their being somewhat off the fishing grounds and the excessive cost of bringing fish to the cannery." Henry Doyle Papers, Box 4, Book 22, p. 137. Although not giving the distance of the plant from the fishing grounds, the statement implies that a cannery not located adjacent to the fishing grounds suffered cost disadvantages.

22. Copies of various operating agreements for each canning district survive, and can be found in the minute books of the Fraser River Canners Association, or successor associations, e.g., Fraser River Canners Association, Minute Book 2, Meeting of Skeena River Canners, March 14, 1904, International Pacific Salmon Fisheries Commission, UBC Special Collections ((hereafter cited as FRCA; IPSFC). See also "Canners Selling Agreement, 1906" FRCA, Minute Book 2, pp. 142-45; British Columbia Canners Association, Minute Book 4, p. 101, IPSFC, UBC Special Collections (hereafter cited as BCCA); and Directors Meeting April 12, 1904, Henry Doyle Papers, Box 4, Book 21. Quality of the canned salmon was judged by the oil content of the fish, the firmness and colour of the canned flesh, and the species of salmon. Fraser River sockeye was recognized as being superior to sockeye from the Skeena, in turn recognized as being better than Rivers Inlet sockeye; all sockeye was valued higher than the "lesser species" of pinks, chums, and cohos. Brand identification was important, but during the early years of the industry well known trade-marks such as "Clover Leaf" were, for the most part, owned by marketing agents, not the canning companies, and salmon from many different companies was often sold under the same label.

23. If labour was scarce, higher wages were offered to attract workers; if the salmon run was poor, cannery managers tried to increase their supply of fish by having their tendermen offer fishermen of other companies higher prices for their catch. Occasionally, a canner might engage in price undercutting as a way to clear his carry-over or gain a larger market share. This was a risky practice because it cut into what were already slim profit margins, and threatened the orderly marketing of the pack. Those who attempted it were looked on as an anathema to the industry.

24. Canada, Sessional Papers Vol. 41, 1906-1907, No. 22, "Annual Report," p. 33.

25. See the comments of H.O. Bell-Irving, Meeting of the Fraser River Canners Association, September 14, 1905, FRCA, Minute Book 2, p. 90.

26. E.E. Evans to Directors of B.C. Packers Association, May 5, 1904, p. 6, Henry Doyle Papers, Box 11, File 12.

27. Prince, p. lxi.

28. Cobb, Canning of Fisheries Products, p. 66.

29. Freeman, p. 117.

30. Meeting of the Association, May 7, 1903, FRCA, Minute Book 1, after p. 254.

31. "B.C. Canners Association, Statistics and Reports, 1903," Henry Doyle Papers, Box 11, File 4; Henry Doyle Papers, Box 4, Book 22, entry for November 5, 1905, p. 75.

32. Henry Doyle to the Honourable R. Prefontaine, March 24, 1903, Henry Doyle Papers, Box 2, File 2.

33. Henry Doyle to the Honourable R. Prefontaine, March 24, 1903, Henry Doyle Papers, Box 2, File 2.

34. O'Bannon, "Technological Change, 1864-1924," pp. 153-54.

35. Prince, p. lxi; Canada, 1905 Commission. Report and Recommendations, pp. 17-18; Stacey, Gulf of Georgia, pp. 31-33.

36. O'Bannon, "Technological Change: A Case Study," pp. 154-55; Stacey, Gulf of Georgia, pp. 32-35.

37. "B.C. Canners Association Statistics and Reports, 1903-1905," Henry Doyle Papers, Box 11, File 4.

38. "Report of Inspection of Canneries," (1911 & 1912), Department of Fisheries General Files, Public Archives of Canada, University of British Columbia, the Library, Microform Division, AW1 R5474: 70 (file 3510) (hereafter cited as "Report of Inspection of Canneries").

39. Henry Doyle Papers, Box 4 Book 23, entry for August 20, 1906.

40. Canada, 1905 Commission. Evidence, Testimony of G.I. Wilson, p. 390.

41. Munn & Larsen to Jarvis; see also Henry Doyle Papers, Box 11, File 12, Rough Notes.

42. Meeting of Canners and Managers of Canneries on the Skeena River, January 6, 1903, FRCA, Minute Book 1, between pp. 232 & 234.

43. Testimony of Robert Bell-Irving, Canada, 1905 Commission. Evidence, p. 122.

44. Canada, 1910 Boat-Rating Commission, pp. 1-3.

45. British Columbia, Report, 1902, p. G29.

46. Meeting, June 24, 1914, BCCA, Minute Book 3, p. 14.

47. British Columbia, Report, 1902, p. G29.

48. Canada, 1910 Boat-Rating Commission.

49. "Working Agreement for Rivers Inlet Canneries for Season 1903," FRCA, Minute Book 1, Between pp. 232 & 234; Minutes of Canners and Managers of Canneries on the Skeena River, January 6, 1903, FRCA, Minute Book 1, between pp. 232 & 234.

50. "Fishing Contract," Minutes of Canners and Managers of Canneries on the Skeena River, January 6, 1903, FRCA, Minute Book 1, between pp. 232 & 234.

51. Minutes of Canners and Managers of Canneries on the Skeena River, January 6, 1903, FRCA, Minute Book 1, between pp. 232 & 234; Meeting of Northern Canners, January 15, 1908, FRCA, Minute Book 2.

52. Henry Doyle Papers, Box 2, File 2.

53. Meeting of Northern Canners, December 17, 1907, FRCA, Minute Book 2, pp. 158-60.

54. Testimony of G.I. Wilson, Canada, 1905 Commission. Evidence, p. 390.

55. Gregory and Barnes, pp. 114-18.

56. Henry Doyle Papers, Box 4, Book 22, entry for August 11, 1905, pp. 26-27.

57. Henry Doyle to Aemilius Jarvis; Henry Doyle Papers, Box 11, File 12, Rough Notes.

58. Summary of Expenditures Made for Additions & Improvements, 1903.

59. Preparations for Pack, 1902 and 1904, Henry Doyle Papers, Box 11, File 12.

60. Results of Operations Since Formation, Henry Doyle Papers, Box 11, File 12.

61. Henry Doyle to Aemilius Jarvis.

62. Henry Doyle to B.C. Packers Association, Henry Doyle Papers, Box 2, File 2.

63. See provincial pack statistics in British Columbia, Report, for years 1905, 1907, and 1908.

Chapter 3: THE MOVE TO NORTHERN WATERS, 1906-1925

1. Western Fisheries, 12 (June 1936): 12.

2. British Columbia, Report, 1904, p. F5.

3. British Columbia, Report, 1904, pp. F3-F5.

4. Conference between delegates from the Fraser River Canners Association and the Puget Sound Canners Association, December 21, 1904, FRCA, Minute Book 2, p. 49.

5. Canada, Sessional Papers Vol. 37, 1903, No. 22, "Annual Report, 1902," p. 103.

6. Meeting of Fraser River Canners Association, September 14, 1905, FRCA, Minute Book 2, p. 90.

7. Canada, Department of Fisheries, Economics Service, The Commercial Salmon Fisheries of British Columbia, Statistical Basebook Series, no. 3 (n.p. n.d), Table 51, p. 109 (hereafter cited as Commercial Salmon Fisheries).

8. Meeting of Fraser River Canners Association, September 14, 1905, FRCA, Minute Book 2, p. 90; and Meeting of Fraser River Canners Association, September 16, 1905, FRCA, Minute Book 2, p. 91.

9. For example see R.E. Lanning to Cannery Managers, District No. 2, May 26, 1925, "Prices to be paid for gill net fish in District No. 2," Canned Salmon Section of the Canadian Manufacturers Association, Minute Book 4, before p. 245 (hereafter cited as CSS); and Meeting of Fraser River canners, July 8, 1925, CSS, Minute Book 4, p. 249.

10. Lyons, p. 242; Cobb, Pacific Salmon Fisheries, p. 414.

11. Testimony of W.H. Barker of B.C. Packers, Canada, 1905 Commission. Evidence, p. 117.

12. Testimony of John T. Williams, fishery inspector for the northern district, Canada, 1905 Commission. Evidence, p. 442.

13. Construction dates are from Canada, 1910 Boat-Rating Commission, Tables 3, 4, and 5.

14. Canada, 1905 Commission. Report and Recommendations, pp. 78-82. John Pease Babcock, Fisheries Commissioner for British Columbia, echoed this call for strict regulation of the salmon fishery in his Annual Report for 1907. See British Columbia, Report, 1907, p. I13.

15. Testimony of Robert Bell-Irving, Canada, 1905 Commission. Evidence, p. 122.

16. Lyons, p. 252, and pp. 360-61.

17. Canada, 1910 Commission.

18. Lyons, pp. 270-71.

19. When the canners failed to agree on boat-ratings in 1908, they sent the matter to an independent board and agreed to accept its findings. Meeting of Northern Canners, January 15, 1908, FRCA, Minute Book 2, pp. 163-64. The ratings awarded by the board are given on p. 167.

20. Canada, Report of Special Fishery Commission, 1917 (Ottawa: n.p., n.d.).

21. Canada, 1910 Boat-Rating Commission. The issue of which level of government had jurisdiction over fishing was settled in 1913, when the Privy Council ruled that the Dominion government had complete control of fishing in provincial waters. Lyons, p. 298.

22. The number of lines in each northern cannery was determined from Tables 1, 2, 4, 5, and 6 in Canada, 1910 Boat-Rating Commission; and inspectors reports in "Report of Inspection of Canneries."

23. For example see the pack statistics for the Cassiar Cannery on the Skeena River in Ross, Appendix A.

24. Canada, 1910 Boat-Rating Commission.

25. "Report of Inspection of Canneries." These reports give the total number of employees working in each cannery. Stacey, Gulf of Georgia, Table 1, pp. 11-12, gives the average size of a cannery crew in the Fraser River canneries between 1898 and 1905 as 84. Practically all canneries in the north employed much larger crews than this, suggesting that the northern canning lines remained largely manual during this period. This was true of both one and two line plants.

26. All references to the number of salmon cannery licences issued are based on a Dominion Department of Fisheries list of salmon cannery licence fees paid from April 1, 1911 to December 31, 1929. This list gives the cannery name, the operating company, and the district (one, two, or three) in which the cannery was located. This list provides a close, but not completely accurate record of the number of canneries that operated each year. Comparing the list against the provincial pack statistics reveals that not all

plants operated every year they were licenced. Some canneries were licenced two or three years before they recorded a pack. In a few instances, canneries that received licences were never built. The low cost of the annual licence probably explains each of these situations: the annual fee was $50.00 from 1911 to 1918, $500.00 from 1919 to 1923, and only $20.00 from 1924 to 1929. During the late 1920's, when the question of which level of government had jurisdiction over the licencing of salmon canneries was being raised, the list is not as accurate as it is in earlier years. Where inaccuracies exist, they have been checked against other sources and corrections made. Despite these drawbacks, this list provides the only reliable source of which canneries operated each year throughout this period, and provides a clear picture of where in the province new canneries were being built. Canada, D.F.O., "Salmon Cannery Licence Fees Paid: April 1st, 1911 to December 31st, 1929," copy supplied by Duncan Stacey (hereafter cited as "Licences Fees Paid").

27. "Commercial Salmon Fisheries," Table 51, p. 109; Strong, p. 113; O'Bannon, "Technological Change, 1864-1924," p. 273.

28. Not all of these plants were built. Eight of the nine licenced in 1916 were built, seven of the eight licenced in 1917 were built, and six of the seven licenced in 1918 were built.

29. Two of the canneries licenced in 1922 did not record packs until 1925.

30. Fifty-one new licences were issued, but six plants were never built.

31. Canneries in this last category are the Wales Island, Kumeon, and Somerville plants, which the provincial pack statistics list as being in the Nass River district, but were built well outside of the river estuary and were not constructed to specifically target the river's sockeye runs; likewise the Prince Rupert Tuck's Inlet, Seal Cove, Captain Cove, and Humpback Bay canneries built outside the Skeena River estuary; and the Margaret Bay, Goose Bay, and Boswell canneries in the Rivers Inlet district, which were built to the south of the Inlet's entrance. The six canneries built within areas already being harvested by other plants were the Haysport, Sunnyside, and Port Edward on the Skeena, the Provincial and McTavish on Rivers Inlet, and the Tallheo Cannery, built opposite the B.C. Packers Bella Coola Cannery at the head of North Bentinck Arm. These canneries competed with the other canneries for their supply of fish.

32. Most of the information on early purse seining is taken from Stacey, Gulf of Georgia, pp. 43-46. O'Bannon, "Technological Change, 1864-1924," provides a less detailed account, pp. 110-11 cover the early Puget Sound fishery, pp. 212-17 cover fishing innovations introduced just after the turn of the century.

33. O'Bannon, "Technological Change, 1864-1924," p. 215; British Columbia, Report, 1902, pp. G7-G9; Henry Doyle to the Honourable R. Prefontaine, March 24, 1903, Henry Doyle Papers, Box 2, File 2, pp. 5-6. As general manager of B.C. Packers, Doyle requested the Dominion Fisheries Minister to allow the use of purse-seines in the waters off of Vancouver Island "to help put our industry on a more even basis with Puget Sound . . .." In February of 1904 the Fraser River Canners Association met to discuss proposed recommendations to fisheries regulations that would allow purse-seining. Meeting, February 24, 1904, FRCA, Minute Book 1, pp. 296a-296c.

34. British Columbia, Report, 1912, pp. I8-I9.

35. Charles H. Gilbert, "Salmon of the Swiftsure Bank," Appendix, p. I17, British Columbia, Report, 1912.

36. The type of fishing equipment used by each cannery is inferred from a document drawn up by British Columbia canners in 1928. This document, an agreement to limit the amount of fishing gear put out by the canning companies, divides the coast into seventeen areas and sets a maximum limit on the number of gill-nets, purse seines, and beach seines that each company can use in each district. The boundaries of these districts were traced on a map with the locations of the canneries to determine what types of fishing gear each cannery used to outfit their fishing fleet. Canadian Manufacturers Association, Canned Salmon Section, "1928 Agreement," copy supplied by Frank Millerd (hereafter cited as "1928 Agreement").

37. Stacey, Gulf of Georgia, pp. 41-43, and p. 47.

38. Meeting of the British Columbia Canners Association, February 7, 1911, BCCA, Minute Book 2, p. 238; Meeting of the British Columbia Canners Association, February 21, 1911, BCCA, Minute Book 2, p. 239. Throughout the years canners continued to oppose the introduction of gas engines in northern waters. After the canneries became more mechanized, diminishing the importance of the labour question, they based their opposition on a number of other concerns: the high cost of purchasing and maintaining the engines, costs that canners would have to cover themselves because fishermen would be unable to earn enough money to pay for them due to longer weekly close periods, a

consequence of the increased catching efficiency of gas boats; the displacement of Indian fishermen from the fishery, since they would be the least able to afford the engines; the increasing economic inefficiency of the canning industry generally, since canneries already received enough fish using oar and sail powered boats--gas boats would only increase costs, increase pressure on the fish stocks, and increase the length of the close periods, leaving canning lines idle for longer periods of time. See Meeting of the Executive Committee, June 27, 1917, BCCA, Minute Book 3, p. 116; British Columbia Canners Association to the Honourable Chas. Stewart, July 24, 1922, BCCA, Minute Book 4, p. 123; Canada, 1917 Commission; Canada, British Columbia Fisheries Commission, 1922. Report and Recommendations (Ottawa: F.A. Acland, 1923), pp. 9-10.

39. J.A. Motherwell to J.P. Babcock, February 14, 1930, GR 435, Box 45, File 413, Provincial Archives of British Columbia, Victoria, British Columbia (hereafter cited as PABC).

40. Canada, 1922 Commission, p. 9.

41. O'Bannon, "Technological Change: A Case Study," p. 162.

42. O'Bannon, "Technological Change: A Case Study," p. 153.

43. Stacey, Gulf of Georgia, pp. 31-33; O'Bannon, "Technological Change: A Case Study," p. 153.

44. O'Bannon, "Technological Change: A Case Study," pp. 156-57; later models would completely eliminate the need for slimers, see p. 164.

45. One canner claimed that with twelve butchers and twelve slimers his cannery packed 1,200 to 1,500 cases per day. Using an Iron Chink he put up the same pack with only four men to operate it and six slimers, a saving of fourteen men, of which twelve were high priced butchers. O'Bannon, "Technological Change: A Case Study," pp. 157-59. E.B. Deming installed two Iron Chinks in his Bellingham Cannery in preparation for the big year of 1905, and in doing so proved the efficiency of the machine. Seven canning lines supplied by the two Iron Chinks put up 10,600 cases of salmon in one day; in 1901, nine canning lines supplied by large butchering crews working night and day put up only 8,600 cases on their best day. O'Bannon, "Technological Change, 1864-1924," p. 208. Both of these examples were provided by Washington State canners, who, using salmon traps, had more secure access to large volumes of fish, and were able to run their lines closer to full capacity far more often than British Columbia canners. This is one reason why American canners adopted butchering machines before their Canadian counterparts.

46. Stacey, Gulf of Georgia, pp. 35-36; O'Bannon, "Technological Change, 1864-1924," pp. 196-97.

47. "Iron Chink Machine," Henry Doyle Papers, Box 5, File 5-7, Speeches and Writings.

48. Stacey, Gulf of Georgia, p. 39; O'Bannon, "Technological Change, 1864-1924," p. 212.

49. Henry Doyle Papers, Box 4, Book 25, entry for July 13, 1914.

50. Stacey, Gulf of Georgia, pp. 37-38; O'Bannon, "Technological Change, 1864-1924," pp. 253-57.

51. Henry Doyle to F.E. Burke, September 5, 1914, Henry Doyle Papers, Box 2, File 7; see also Henry Doyle Papers, Box 4, Book 25, entry for July 13, 1914.

52. BCCA, Minute Book 3, p. 22, and p. 26.

53. Henry Doyle Papers, Box 4, Book 27, entry for October 19, 1916.

54. Henry Doyle Papers, Box 4, Book 25, entry for August 8, 1911.

55. Plans of Salmon Canneries.

56. British Columbia, Report, 1918, pp. X9-X10.

57. British Columbia, Report, 1907, p. I7.

58. Pacific Fisherman, 26 (December 1928): 20; Commercial Salmon Fisheries, Table 51, p. 109; British Columbia, Report, 1913, p. R7; Report, 1915, p. S8; Report, 1922, p. T6.

59. Meeting with W.J. Bowser, March 24, 1914, BCCA, Minute Book 3, p. 2; Minute Book 3, p. 54 (1915); Special Meeting of Association, November 25, 1919, Minute Book 3, p. 254.

60. Canada, !917 Commission; Lyons, p. 286; Ross, p. 92.

61. Canada, 1917 Commission.

62. Canada, 1917 Commission.

63. British Columbia, Report, 1919, pp. U69-U70.

64. Canada, 1917 Commission.

65. Memo for Canners Meeting dated today January 18, 1921, BCCA, Minute Book 4, p. 8; O'Bannon, "Technological Change, 1864-1924," pp. 292-94; Lyons, pp. 347-49.

66. Memo for Canners Meeting, dated today January 18, 1921, BCCA, Minute Book 4, pp. 7-10. Four million cases of salmon was the amount on hand in the United States, Alaska, and British Columbia. The carry-over from British Columbia was 750,000 cases, of these roughly 455,000 cases were pinks, 170,000 cases were chums, and the remainder split between sockeye, springs, and cohos.

67. "Recommendations of the Committee to be presented with the suggested Boat Ratings for the Skeena, Naas [sic] & Rivers Inlet on February 3RD, 1921," BCCA, Minute Book 4, pp. 14-16.

68. "Licences Fees Paid." Henry Doyle was also busy during this period, trying to interest the California Packing Company (C.P.C.) in amalgamation. In a 1925 letter he wrote that

> . . . [between 1922 and 1924] it would have been an easy matter to have effected an amalgamation of practically all the then existing interests. . . . With the return of prosperity as a result of 1924 operations none of the leading companies would consider amalgamating with their competitors. All of them increased their holdings by absorbing weak or timid operators, thus reducing the number of competitors, thereby strengthening themselves and obtaining some of the benefits an amalgamation would have given them.

See Henry Doyle to A.M. Lester, October 1, 1925, Henry Doyle Papers, Box 2, File 13. This file contains other correspondence regarding a proposed amalgamation, as does Box 6, File 10. O'Bannon, in "Technological Change, 1864-1924" (pp. 310-11), says that the C.P.C. had gained control of the Alaska Packers Association in 1916, but the company apparently expressed little interest in Doyle's proposal. Nevertheless, much of what Doyle proposed would occur before the decade closed.

69. "Licence Fees Paid."

70. Henry Doyle Papers, Box 4, Book 21, entry for May 4 (1903?).

71. Henry Doyle Papers, Box 4, File 27, entry for March 20, 1917.

72. Lyons, p. 340.

73. Aemilius Jarvis to Henry Doyle, April 28, 1927, Henry Doyle Papers, Box 1, File 4.

74. Henry Doyle to Chas. Wurtele, April 5, 1917, Henry Doyle Papers, Box 2, File 8. See also Henry Doyle to Aemilius Jarvis, March 9, 1926, Henry Doyle Papers, Box 2, File 14.

75. Ross, p. 29., and pp. 93-97.

76. Ross, p. 29.

Chapter 4: THE CLOSURE OF CANNERIES, 1926-1931

1. "Licence Fees Paid."

2. W.A. Carrothers, The British Columbia Fisheries, with a Forward by H.A. Innis (Toronto: The University of Toronto Press, 1941), Table 17, p. 41.

3. "Statistics of Industry in British Columbia," Table FG 3.

4. Lyons, p. 240, p. 350, and pp. 360-66. B.C. Packers completed its purchase of Wallace Fisheries on March 4, 1926. W.H. Barker, who had consistently opposed purchasing Wallace Fisheries resigned from his position as President of B.C. Packers on March 24. Campbell Sweeny, a long time member of the company's board of directors, also resigned at the same time.

5. R.C. Gosse to J.P. Babcock, February 22, 1927, GR 435, Box 141, File 1927, PABC.

6. Probably not all of these canneries were built. Only three of them recorded packs in 1927, two recorded their first packs in 1929, and two never recorded packs at all. This was determined by checking company names in "Licenced Fees Paid" against company names listed in the annual pack statistics given in, British Columbia, Report.

7. Carrothers, Table 17, p. 41. By this time some gill-net boats were owned and outfitted by independent fishermen, although the canning companies still maintained sizable fleets. Purse-seiners were almost all owned and outfitted by canners.

8. Lyons, pp. 372-73.

9. Pink salmon run in two year cycles, and run in large numbers to the Fraser River and other southern waters in odd numbered years (e.g., 1925, 1927), and to northern waters, especially the Queen Charlotte Islands and the Skeena River, in even numbered years. M.P. Shepard and

J.C. Stevenson, "Abundance, Distribution, and Commercial Exploitation of the Fisheries Resources of Canada's West Coast," in Transactions of the Ninth British Columbia Natural Resources Conference (February 1956), pp. 143-44.

10. Pacific Fisherman Statistical Number 26 (January 1928): 70, and 120; Lyons, p. 370.

11. "Memorandum for the Honourable S.L. Howe With Respect to the Salmon Industry of the Province of British Columbia," British Columbia Commercial Fisheries Branch, GR 1378, PABC, p. 6 (hereafter cited as Memorandum).

12. Pacific Fisherman Statistical Number 26 (January 1928): 70; "1928 Agreement."

13. "1928 Agreement;" Lyons, pp. 371-72.

14. The waters affected by this system of graduated closures were the Skeena and Nass Rivers, Gardner Canal, Fitzhugh Sound, Fisher Channel, Dean Channel, Burke Channel, Rivers Inlet, Smith Inlet, Masset Inlet, and Skidegate Inlet. GR 435, Box 45, File 414; Pacific Fisherman 26 (January 1928): 22; Pacific Fisherman 26 (February 1928): 19; Lyons, p. 384.

15. Meeting of October 10, 1927, CSS, Minute Book 4, pp. 280-81.

16. "1928 Agreement."

17. Canners discussed the prospect of longer closed periods in their association meetings, acknowledging that it gave them greater incentive to limit their fishing gear. See Minutes of Special Meeting, March 20, 1928, CSS, Minute Book 4, p. 289.

18. H. Miskin to Richard J. Gosse, June 21, 1928, GR 435, Box 153, File 1928.

19. A.S. Arkley (Evans, Colman & Evans) to British Columbia Packers Ltd., June 21, 1928, GR 435, Box 153 File 1928; "Memorandum," pp. 10-12. GR 435, Box 153, File 1928, contains numerous letters between R.J. Gosse (now a director of B.C. Packers) and various representatives of brokerage firms responsible for selling British Columbia canned salmon on international markets. The majority of this correspondence details the deteriorating quality of B.C. canned salmon over the preceding years, a problem unanimously attributed to carrying the fish long distances to the cannery before processing. Gosse advises the representatives that provincial canners have just entered into a five year agreement designed to curtail the amount

of fishing gear used, and to improve the quality of the pack. Following the 1928 season the Pacific Fisherman noted that the quality of the British Columbian pack was improving, and attributed the improvement to the elimination of long hauls between the fishing grounds and the canneries. Pacific Fisherman, 26 (November 1928): 33.

20. Pacific Fisherman 26 (January 1928): 9-10.

21. Lyons, pp. 372-73.

22. Pacific Fisherman 26 (May 1928): 28.

23. Jarvis to Doyle, April 23, 1928, Henry Doyle Papers, Box 1, File 4.

24. Lyons, p. 373. Jarvis told the annual meeting of B.C. Packers' shareholders that a merger between the two companies would save an estimated $750,000 in operating costs per year. Pacific Fisherman 26 (May 1928): 28.

25. Capitalization of the consolidation was approximately eight million dollars. Pacific Fisherman 26 (April 1928): 9-10. B.C. Packers Ltd. took over Millerd Packing Company Limited on May 31, 1928. For a more detailed overview of the mergers and the names of all the major and subsidiary companies involved see "History of the British Columbia Packers, Ltd.," Western Fisheries 12 (June 1936): 13. Lyons discusses the consolidation and the companies involved several times, see pp. 239-41, p. 348, and pp. 373-374.

26. "Wallace Fisheries Ltd.," Henry Doyle Papers, Box 6, File 10.

27. Doyle to Jarvis, May 5, 1927, Henry Doyle Papers, Box 2 File 14. The pack totals for the Vancouver Cannery were 99,634 cases, against 59,379 cases for the four B.C. Packers' plants. The difference is accounted for by the large numbers of pinks and chums put up by Gosse, 11,262 cases and 47,730 respectively; B.C. Packers canned only 559 cases of pinks and 5,629 cases of chums, further evidence of the company's reluctance to pack the cheaper species. See pack statistics in British Columbia, Report, 1926.

28. "Wallace Fisheries Ltd.," Henry Doyle Papers, Box 6, File 10.

29. Lyons, p. 399.

30. Pacific Fisherman Statistical Number 30 (January 1932): 54, 56, and 61.

31. The Shannon Bay Cannery remained closed until 1936; the Alert Bay Cannery was only operated intermittently, packing salmon in 1933, 1940, and 1941, after which it was permanently closed. The four other canneries reopened in 1932.

32. Methods of transporting fish were improving, but they were expensive, and did not ensure an acceptable product on arrival at the cannery. Packing raw salmon in crushed ice on the fish scows had lengthened the distances fish could be safely carried, and the Dominion government issued an order-in-council in 1928 requiring that all pink salmon caught around the Queen Charlotte Islands be gutted and iced prior to shipment to the mainland for canning. The estimated cost of complying with this requirement was 21 cents per case. But the factors that could adversely affect the quality of the salmon en route, in addition to the distance travelled, were numerous, and applied to all tendering, not just the journey across from the Charlottes. The poor weather and rough sea conditions common to the coast often delayed cannery tenders. Frequently salmon were improperly packed in ice causing them to spoil before reaching the cannery. And many of the fish scows used to transport the salmon were inadequately equipped to accommodate the fish for longer distances--the movement of fish within the hold usually crushed those on the bottom, while those on top were often left exposed to the sun. Any attempts to transport fish between districts usually resulted in the quality problems discussed above (see note 19). For a discussion of the increasing use of refrigeration techniques in fishing generally see Pacific Fisherman Refrigeration Number 26 (August 1928): 9-57 passim. For references to the Dominion order-in-council see Telegram, J.O. Morris to W.A. Found, June 19, 1928, GR 435, Box 153, File 1928; note attached to letter, J.A. Motherwell to J.P. Babcock, June 27, 1928, GR 435, Box 153, File 1928; Pacific Fisherman 26 (July 1928): 27. The estimated cost of complying with this regulation, and the problems associated with tendering fish these distances, was taken from R.C. Gosse to Hugh Dalton, June 6, 1928, GR 435, Box 153, File 1928. For a more detailed discussion on the problems of carrying salmon see "Comments on 'A Canner's Opinion of the Workings of the Inspection Board for (B.C.) Canned Salmon,' by Mr. S. Humphreys of the Colonial Packers Ltd.," GR 1378, Box 7, File 5.

33. "Statistics of Industry in British Columbia," Table FG 3.

34. Carrothers, Table 17, p. 41.

35. For world production of canned salmon see Gregory and Barnes, Figure 1, p. 8; for opening prices see Commercial Salmon Fisheries, Table 51, p. 109.

36. Western Fisheries 10 (October 1935): 19. B.C. Packers had been involved in the fresh, frozen, smoked, and mild-cure fish trade, but had divested itself of these operations in 1931. After weathering the financial storms of the mid 1930's the company moved back into these areas, purchasing Edmunds and Walker Limited in 1939. See Lyons, p. 428. Regarding B.C. Packers' near bankruptcy see Western Fisheries 10 (October 1935): 15; and the Vancouver Sun, January 17, 1942. Gregory and Barnes (p. 102) state that B.C. Packers did declare bankruptcy in the early 1930's, and was taken over by banks and can manufacturers who extended "considerable amounts of credit" to keep the company operating.

37. Frank Millerd provides a detailed discussion of the lack of entry barriers in "Expansion and Consolidation in the British Columbia Salmon Canning Industry, 1903-1928," Department of Economics, Research Paper Series No. 8014, (Wilfrid Laurier University, n.d.), copy supplied by Frank Millerd.

38. Michael Bliss, Northern Enterprise: Five Centuries of Canadian Business (Toronto: McClelland and Stewart Ltd., 1987), p. 359. For an expanded discussion of the attitudes of Canadian producers towards operating agreements and consolidations, and the use of agreements and consolidations as self-regulative mechanisms, see Michael Bliss, A Living Profit: Studies in the Social History of Canadian Business, 1883-1911 (Toronto: McClelland and Stewart Ltd., 1974), especially Chapter 2, "The Flight From Competition," pp. 33-54. See also Tom Traves, "Security Without Regulation," in The Consolidation of Capitalism: 1896-1929, ed. Michael S. Cross and Gregory S. Kealey (Toronto: McClelland and Stewart Ltd., 1983), pp. 19-44.

SELECTED BIBLIOGRAPHY

Manuscript Collections

Canada. Public Archives of Canada. Department of Fisheries General Files. "Report of Inspection of Canneries." University of British Columbia. The Library, Microform Division. AW1 R5474:70, file 3510.

Vancouver, British Columbia. University of British Columbia. The Library, Special Collections Division. Henry Doyle. "Rise and Decline of the Pacific Salmon Fisheries."

Vancouver, British Columbia. University of British Columbia. The Library, Special Collections Division. Henry Doyle Papers.

Vancouver, British Columbia. University of British Columbia. The Library, Special Collections Division. International Pacific Salmon Fisheries Commission. Minute Books of the Fraser River Canners Association, British Columbia Canners Association, and the Canned Salmon Section of the Canadian Manufacturers Association.

Vancouver, British Columbia. University of British Columbia. The Library, Special Collections Division. Insurer's Advisory Organization. British Columbia Fire Underwriters Association. Plans of Salmon Canneries in British Columbia Together With Inspection Reports on Each (August, 1924).

Victoria. Provincial Archives of British Columbia. British Columbia Department of Fisheries Records. GR 435.

Victoria. Provincial Archives of British Columbia. British Columbia Commercial Fisheries Branch. GR 1378.

Unpublished Materials

Roberts, A., Newell, D., and Higginbottom, E. "SFU/UBC Inventory of Historic Salmon Cannery Sites." 8 Vols.

Simon Fraser University: Department of Geography. (Typescript.)

Trade Journals

Pacific Fisherman. Vol. 26. (1928).

Pacific Fisherman Statistical Number. Vols. 26 & 30. (1928 & 1932).

Western Fisheries. Vols. 10-12. (1935-1936).

Government Reports

British Columbia. Department of Fisheries. Report of the Commissioner of Fisheries. (1902-1930).

Canada. Parliament. Sessional Papers. "Annual Report of the Department of Marine and Fisheries" [department name varies]. (1876-1907).

_____. Dominion-British Columbia Fisheries Commission, 1905-1907. Report and Recommendations. Ottawa: Government Printing Bureau, 1908.

_____. Dominion-British Columbia Fisheries Commission, 1905-1907. Evidence. Ottawa: Government Printing Bureau, 1908.

_____. Dominion-British Columbia Boat-Rating Commission, 1910. Report and Recommendations. Ottawa.

_____. Report of Special Fishery Commission, 1917. Ottawa.

_____. British Columbia Fisheries Commission, 1922. Ottawa: F.A. Acland, 1923.

Canada. D.F.O. "Salmon Cannery Licence Fees Paid: April 1, 1911 to December 31, 1929." Photocopy of list supplied by Duncan Stacey.

Canada. Department of Fisheries. Economics Service. The Commercial Salmon Fisheries of British Columbia. Statistical Basebook Series, no. 3. N.p. N.d.

Newspapers

Daily Province, October 27, 1937, p. 7.

Vancouver Sun, January 17, 1942, p. 26.

Articles and Books

Bliss, Michael. A Living Profit: Studies in the Social History of Canadian Business, 1883-1911. Toronto: McClelland and Stewart Ltd., 1974.

_____. Northern Enterprise: Five Centuries of Canadian Business. Toronto: McClelland and Stewart Ltd., 1987.

Browning, Robert J. Fisheries of the North Pacific: History, Species, Gear and Processes. Anchorage: N.W. Publishing Co., 1974.

Carrothers, W.A. The British Columbia Fisheries. Forward by Harold A. Innis. Toronto: University of Toronto Press, 1941.

Cobb, John N. Canning of Fisheries Products. Seattle: Miller Freeman, 1919.

_____. Pacific Salmon Fisheries. 4th ed. Washington: U.S. Department of Commerce, Bureau of Fisheries, Fisheries Document no. 1092, 1930.

Economic Council of British Columbia. Research Department. Statistics of Industry in British Columbia, 1871-1934. Typescript. Victoria: 1935.

Forester, Joseph E, and Forester, Anne D. Fishing: British Columbia's Commercial Fishing History. Saanichton, B.C.: Hancock House Publishers Ltd., 1975.

Freeman, Otis W. "Salmon Industry of the Pacific Coast." Economic Geography 11 (April 1935): 109-129.

Gregory, Homer E., and Barnes, Kathleen. North Pacific Fisheries. Studies of the Pacific, no. 3. New York: American Council, Institute of Pacific Relations, 1939.

Lyons, Cicely. Salmon Our Heritage: The Story of a Province and an Industry. Vancouver: Mitchell Press Ltd., 1969.

McDonald, Robert A.J. "Victoria, Vancouver, and the Economic Development of British Columbia, 1886-1914." In British Columbia: Historical Readings, pp. 369-395. Edited by W. Peter Ward and Robert A.J. McDonald. Vancouver: Douglas and McIntyre Ltd., 1981.

McKervill, Hugh W. The Salmon People: The Story of Canada's West Coast Salmon Fishing Industry. Sidney, B.C.: Gray's Publishing Ltd., 1967.

Millerd, Frank. "Expansion and Consolidation in the British Columbia Salmon Canning Industry, 1903-1928." Department of Economics, Research Paper Series No. 8014. N.d. Wilfrid Laurier University. Copy supplied by Frank Millerd.

O'Bannon, Patrick W. "Technological Change in the Pacific Coast Canned Salmon Industry, 1900-1925: A Case Study." Agricultural History 56 (1982): 151-166.

Ralston, Keith. "Patterns of Trade and Investment on the Pacific Coast, 1867-1892: The Case of the British Columbia Salmon Canning Industry." In British Columbia: Historical Readings, pp. 296-305. Edited by W. Peter Ward and Robert A.J. McDonald. Vancouver: Douglas and McIntyre Ltd., 1981.

Reid, David J. The Development of the Fraser River Salmon Canning Industry, 1885-1913. Economics and Sociology Unit, Northern Operations Branch, Fisheries and Marine Services, Pacific Region, Canada, Department of the Environment, NOB/ECON 4-73, July 1973.

Shepard, M.P., and Stevenson, J.C. "Abundance, Distribution, and Commercial Exploitation of the Fisheries Resources of Canada's West Coast." In Transactions of the Ninth British Columbia Natural Resources Conference, pp. 131-190. (February 1956).

Skogan, Joan. Skeena: A River Remembered. Cloverdale, B.C.: D.W. Friesen & Sons Ltd., 1983.

Stacey, Duncan. Gulf of Georgia Cannery, Steveston, British Columbia, 1894-1930. Parks Canada publication, n.d. Copy supplied by Duncan Stacey.

_____. "North Pacific Cannery, Port Edward, British Columbia." Research Paper prepared for the Historic Sites and Monuments Board of Canada. Copy supplied by Duncan Stacey.

Traves, Tom. "Security Without Regulation." In The Consolidation of Capitalism: 1896-1929, pp. 19-44. Edited by Michael S. Cross and Gregory S. Kealey. Toronto: McClelland and Stewart Limited, 1983.

Essays, Theses, and Dissertations

Lee, Helen. "Corporate Strategy in the British Columbian Fish-Processing Sector." M.A. thesis, Simon Fraser University, 1983.

O'Bannon, Patrick William. "Technological Change in the Pacific Coast Canned Salmon Industry, 1864-1924." Ph.D. dissertation, University of California, San Diego, 1983.

Ralston, Harry Keith. "The 1900 Strike of Fraser River Sockeye Salmon Fishermen." M.A. thesis, University of British Columbia, 1965.

Ross, William M. "Salmon Cannery Distribution on the Nass and Skeena Rivers of British Columbia, 1877-1926." Graduating Essay, University of British Columbia, 1967.

Sandberg, Lars Anders. "Study in Canadian Political Economy: A Critical Review and the Case of the B.C. Salmon Canning Industry, 1870-1914." M.A. thesis, University of Victoria, 1979.

Strong, G. Gordon. "The Salmon Canning Industry in British Columbia." Graduating Essay, University of British Columbia, 1934.

APPENDIX A

CANNERY NAMES AND YEAR OF CONSTRUCTION

Number	Cannery	Built
MAP 1		
Fraser River		
FR 1.	Annieville	1871
FR 2.	Stamps/Cunningham & Holbrook/ Laidlaw #1/King & Co.	1871
FR 3.	Finlayson & Son/Finlayson & Lane/Loggie & Co.	1871
FR 4.	Brownsville (precise location unknown)	1872
FR 5.	Deas Island/Brodie's	1873
FR 6.	Ewen's (Lion Island)	1876
FR 7.	Ewen & Wise	1877
FR 8.	Delta	1878
FR 9.	Laidlaw #2	1878
FR 10.	Bon Accord/Haigh's/Coquitlam	1879
FR 11.	Wellington	1880
FR 12.	British American	1882
FR 13.	Harlock (1887)/British Union (1882)	1882
FR 15.	Richmond	1882
FR 16.	Wadham's	1883
FR 17.	Boutillier	1886
FR 18.	Canoe Pass	1889
FR 19.	Beaver/New Richmond	1889
FR 20.	Sea Island/Munn's	1889
FR 21.	Burrard/Hobson & Co./ Garry Point	1889
FR 22.	Britannia	1890
FR 23.	Terra Nova	1892

Number	Cannery	Built
FR 24.	Federation/Steveston/ Lighthouse/Empire	1893
FR 25.	Brunswick #1 (Steveston)	1893
FR 26.	Imperial	1893
FR 27.	Pacific Coast	1893
FR 28.	Canadian Pacific/Red	1893
FR 29.	Fisherman's/Hinchcliff	1894
FR 30.	Gulf of Georgia	1894
FR 31.	Dinsmore Island/Good Murphy	1894
FR 32.	Atlas	1895
FR 33.	Star	1895
FR 34.	London	1895
FR 35.	Anglo-American	1896
FR 36.	Westham Island	1896
FR 37.	Hume's	1896
FR 38.	Fraser River Canning/ Canadian Canning	1896
FR 39.	Vancouver	1896
FR 40.	Alliance	1896
FR 41.	Provincial	1896
FR 42.	Fraser River Industrial/ Glenrose/Birrells	1896
FR 43.	Westminster/Lam Tung	1896
FR 44.	Brunswick #2 (Canoe Pass)	1897
FR 45.	Currie, McWilliams & Co.	1897
FR 46.	Colonial	1897
FR 47.	Welsh's/Celtic	1897
FR 48.	Ontario Packing/Premier	1897
FR 49.	Cleeve Canning and Cold Storage	1897
FR 50.	Western Fishing	1897
FR 51.	Sinclair/Mayflower	1897
FR 52.	Albion Island	1899
FR 53.	Scottish Canadian	1899
FR 54.	Acme	1899
FR 55.	Greenwood	1899
FR 56.	St. Mungo #2	1899

Number	Cannery	Built
FR 57.	National	1901
FR 58.	Kildala/Harlock Island	1905
FR 59.	Great West	1906
<u>Vancouver Harbour</u>		
VA 1.	Coal Harbour Fishery (Spratt's Ark)	1883
VA 2.	English Bay	1898
VA 3.	Great Northern	1900
VA 4.	Eagle Harbour	1901
VA 5.	Vancouver Fish Co.	1905
VA 6.	Home Plant	1918
VA 7.	Bidwell Street Cannery	1928
<u>Vancouver Island</u>		
VI 1.	Alert Bay	1881
VI 2.	Clayquot	1885
VI 3.	Kildonan	1903
VI 4.	Quathiaski Cove	1904
VI 5.	Empire	1905
VI 6.	Pender Harbour	1906
VI 7.	Quatsino	1911
VI 8.	Capital City Packing and Canning	1913
VI 9.	Nanaimo	1914
VI 10.	Shushartie Bay	1914
VI 11.	Blind Channel	1916
VI 12.	Lasqueti	1916
VI 13.	Nitinat	1917
VI 14.	Nootka	1917
VI 15.	Redonda Bay	1917
VI 16.	Saanich	1917
VI 17.	Port Renfrew	1918
VI 18.	Deep Bay	1918
VI 19.	San Mateo	1919
VI 20.	Sooke	1919
VI 21.	Hecate	1926

Number	Cannery	Built
VI 22.	Sointula	1926
VI 23.	Bones Bay	1928
VI 24.	Caledonia	1928
VI 25.	Alberni	1929
VI 26.	Koprino	1929
VI 27.	Green Bay (location unknown)	1917
VI 28.	Grappler Creek (location unknown)	1919
Rivers Inlet		
RI 1.	Rivers Inlet	1882
RI 2.	Quashella	1883
RI 3.	Victoria/Wannock	1884
RI 4.	Victoria	1892
RI 5.	Good Hope	1895
RI 6.	Brunswick	1896
RI 7.	Wadhams	1897
RI 8.	Vancouver/Green's	1897
RI 9.	Smiths Inlet	1902
RI 10.	Beaver	1906
RI 11.	Kildala	1906
RI 12.	Strathcona	1906
RI 13.	Provincial	1917
RI 14.	McTavish	1918
RI 15.	Margaret Bay	1919
RI 16.	Goose Bay	1923
RI 17.	Boswell	1926
RI 18.	Le Roy Bay	1929
Outlying Districts		
OD 1.	Namu	1893
OD 2.	Knight Inlet #1	1907
OD 3.	Knight Inlet #2 (Glendale Cove)	1910
OD 4.	Seymour Inlet	1911
OD 5.	Jervis Inlet	1912
OD 6.	Kingcome Inlet (Charles Creek)	1914

Number	Cannery	Built
MAP 2		
Outlying Districts		
OD 7.	Lowe Inlet	1890
OD 8.	Bella Coola	1900
OD 9.	Kimsquit	1901
OD 10.	Manitou	1907
OD 11.	Butedale	1911
OD 12.	East Bella Bella	1912
OD 13.	Crab River	1917
OD 14.	Tallheo	1917
OD 15.	Barnard Cove	1925
OD 16.	Klemtu*	1927
OD 17.	Walker Lake	1927
	Price's (location unknown)	1890
Skeena River		
SR 1.	Inverness	1876
SR 2.	Windsor	1878
SR 3.	Metlakatla	1882
SR 4.	Cunningham	1883
SR 5.	Balmoral	1883
SR 6.	British American	1883
SR 7.	North Pacific	1889
SR 8.	Standard	1890
SR 9.	Claxton/Royal Canadian	1892
SR 10.	Carlisle	1895
SR 11.	Skeena River Commercial	1899
SR 12.	Ladysmith/Turnbull's/ Village Island	1901
SR 13.	Cassiar	1903
SR 14.	Oceanic	1903
SR 15.	Alexandra	1904
SR 16.	Dominion	1906
SR 17.	Tuck's Inlet	1913

*This was also the location of the China Hat Cannery, built in 1900.

Number	Cannery	Built
SR 18.	Sunnyside	1916
SR 19.	Port Edward	1918
SR 20.	Haysport	1920
SR 21.	Seal Cove	1924
SR 22.	Captain Cove	1926
SR 23.	Humpback Bay/Porcher Is.	1929
Nass River		
NR 1.	Croasdaile's	1881
NR 2.	Nass Harbour	1881
NR 3.	Douglas	1882
NR 4.	Mill Bay/British Columbia	1888
NR 5.	Cascade	1889
NR 6.	Arrandale	1905
NR 7.	Port Nelson	1905
NR 8.	Wales Island	1911
NR 9.	Kumeon/Portland	1918
NR 10.	Somerville	1918
Queen Charlotte Islands		
QC 1.	Alliford Bay	1912
QC 2.	Wallace Fisheries (Naden Harbour)	1912
QC 3.	Lagoon Bay/Cumshewa	1918
QC 4.	Lockeport	1918
QC 5.	Henslung Bay	1918
QC 6.	Wa-tun	1920
QC 7.	Langara (Masset)	1924
QC 8.	Langara (Naden Harbour)	1925
QC 9.	Jedway	1926
QC 10.	Shannon Bay	1926
QC 11.	South Bay	1926
QC 12.	Ferguson Bay	1927
QC 13.	Masset (Masset Canners)	1927
Floating Canneries		
Laurel Whalen	(various locations)	1924