A GEOGRAPHICAL STUDY OF
THE PORT OF VANCOUVER
IN RELATION TO
ITS COASTAL HINTERLAND

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The Port of Vancouver, situated on Burrard Inlet in southwestern British Columbia, is of major importance both as a world deep-sea port and as a coastal port. This importance in a dual function results from: first, the wealth of forestry and fishery resources of coastal British Columbia; secondly, the ability of the port to forward to world markets the produce resulting from these resources; and finally, the fact that Vancouver is a major bulk grain exporting port.

The port occupies all of Burrard Inlet which was first seen by Europeans in 1791. It was not until 1859, however, when an unsuccessful attempt was made to mine coal, that any use was made of the area. The years of early growth from 1862 to 1886 were marked first by the start of lumbering on Burrard Inlet followed in 1886 by the incorporation of the City of Vancouver and the completion of the Canadian Pacific Railway to Port Moody. By 1919 bulk shipments of wheat from Vancouver via the Panama Canal had been proved as successful. Thus, with wheat shipments established and the lumber industry extending beyond the limits of Burrard Inlet, the Port of Vancouver had become established as a world export centre of wheat and wood products.

As Vancouver increased in importance as an exporting port, so there followed an increase in industrialization with the resultant increase in population, industrial power, supply and rail facilities. However, available industrial locations
on the harbour waterfront had become scarce with the result that some new, large industries -- most notably pulp and paper -- were located in small coastal settlements nearer the sources of raw material. From these small centres there started direct shipments to world markets rather than exclusively through Vancouver. As small out-ports operating alone, it is doubtful if such an arrangement would have been possible; with the attraction of manufactured goods and wheat available in Vancouver, however, it was possible to draw ships to British Columbia and so to the small ports with their special commodities for world markets. At the same time Vancouver profitted because of its own deep-sea shipments, plus the fact that the out-ports are dependent on Vancouver for virtually all requirements of labour, food supply and mechanical equipment.

This dependence by the coastal area on Vancouver is the basis of very extensive coastal movement of various specialized types of vessels which operate almost exclusively from Vancouver. Thus the Port of Vancouver, competing economically, but cooperating functionally with the out-ports, is a coastal port of major significance while at the same time its world shipments place it in a position of importance as a deep-sea port.
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A geographical study of a port may be made in two ways. The first approach is the classical, systematic method, which begins with location and passes on through all the aspects of physical, human and economic geography. A study following this procedure can no doubt produce the desired result of well correlated factual information, firm conclusions and, if necessary, a degree of prediction. This approach, however, does not emphasize sufficiently the most significant relationship.

The relationship to be stressed is the one that exists between the land, in terms of hinterlands, and the sea, in terms of shipping routes, ships, commodities and markets.

To overcome possible weaknesses and to depict clearly the prime relationship, a second method can be used. An explanation of the second method of treatment can be covered with the brief headings: why does a port exist in a certain place; how has that port grown; what are its relationships to the land in terms of hinterlands; what are its relationships to the sea in terms of its local importance and its world importance?

Three Basic Concepts

For further clarification of what is, to all intents and purposes, a relatively new field of geographic research and writing in Canada the awareness of certain basic concepts is
necessary. The first, and most elemental factor is that a port is a zone of transition between methods of transportation. The very life, success, and value of a port hinges on its ability to fulfill the primary function of transit between the methods of land transport and the methods of marine transport.

The second major concept concerns hinterlands. The traditional idea of a hinterland, as that portion of space that is served by a port or whose people and industry use a port for entry or exit, can, in general be applied only to a young country with incomplete internal communications and new, underdeveloped ports. In a country such as Canada where settlement, transportation, agriculture and industrial development are well beyond the pioneer stage, numbers of hinterlands appear; indeed, there may be a hinterland for each commodity. Again, each of these hinterlands may well be represented within the port area by a variety of forms of shipping, different commodities requiring, or being adaptable to, different forms of transportation.

A third concept concerns shipping and its place in a geographical study. It is a fact that a ship, as such, is not geographic. However, where a type of ship or method of marine transportation has been developed in response to certain environmental conditions, then that specialized form of shipping becomes of geographic significance. Several specialized methods of shipping have been developed in British Columbia for specific uses. As there is a close relationship between certain natural resources of the province and these special methods, a des-
cription of them and of their uses has been included. Some of the more standardized types of shipping have also been included in order to make the section complete.

A final concept, and one applying to Canada in particular, is that the major ocean ports of the country are Canadian rather than regional or provincial ports. The implication presented with this idea is that Halifax and Montreal, for example, are almost as important to the fruit farmer of British Columbia and the trapper of the Northwest Territories as they are to the people of Nova Scotia, the Montreal region or Eastern Canada; in exactly the same way, Vancouver is almost as important to the Eastern Canadian as to the British Columbian. Although each port has considerable local or regional importance through its own coastal shipping, nevertheless, the fact that Canadian ports have great national importance, rather than purely local importance, must be considered. The reason is simple. Commodities exported are relatively few but in large quantities. These commodities are moved to sea-ports by long railway lines that cut across many of the regions of Canada and tap most of the various hinterlands. Therefore, Canadian produce destined for world markets can move to either eastern or western ports.

An awareness of the basic concepts, combined with the method of treatment to be followed, will result in an understanding of the Port of Vancouver as it fits into the inter-relationship between land and sea. Not only will the motivations of the port’s functions be seen, but there will also appear certain factors of both the natural and cultural land-
scapes which any reader may subtract from the completed work to apply to his own particular field of interest. This latter phase will be supported wherever possible by maps, photographs, diagrams and statistical tables.

Unfortunately there are weaknesses in the statistical treatment. In part this can be attributed to a change in port administration in 1936. A further difficulty results from the lack of the figures on commodity tonnages moved by coastal shipping between ports in British Columbia. A final weakness, and possibly the most serious, is a continual lack of agreement between shipping figures published by the Dominion Bureau of Statistics in the annual "Shipping Report" and those shown for the Port of Vancouver in annual reports published by the National Harbours Board. In part, this discrepancy is due to human error, but at the most only 1-2%. The greatest portion of the error stems from the fact that the Dominion Bureau of Statistics does not record any vessel of less than 10 tons. In recording the movement of fishing vessels there is also disagreement. The National Harbours Board lists each vessel, every time it enters port, while the Dominion Bureau of Statistics records each vessel only once during a fishing season.

Despite these weaknesses, an attempt has been made to give as clear an explanation as possible of why Vancouver, with the geographical location that was chosen many years ago, operates as a major sea-port to-day.
Field Work

In order to discover why the Port of Vancouver has become so important, its historical origin, physical setting, growth and present operation, had to be investigated. This was accomplished in two parts: first, observation and investigation in the field; second, the study of reports and articles resulting from surveys by others.

The major portion of the field work was done in July, 1950, preceded by periodic investigations in October and November, 1949. This work consisted partly of a study of the physical features of the port, the dock installations, locations of industry, lines of communications, types of shipping, the divisions of the harbour, and the interrelationships of each of these. A second, and equally important part of the work consisted of interviews and correspondence with Federal, Provincial and Municipal Government authorities, industrial representatives and members of shipping firms.

The purpose of the interviews was to supplement the information gained by personal observation and study. This activity covered a wide range of subjects such as sources of natural resources; types of vessels, their origin and uses; growth of industry, rail services and power supply; and most important, definite statistical information on the shipping activity of Vancouver. With the exception of one major item, a great deal of cooperation was received. The exception was in connection with unpublished statistical information and here the best that could be expected was a rough guess or an
estimate as to quantities or volumes moved through the port. Very often statistical data were refused.

Previous Work by Others

Because of the failure to secure unpublished statistics, it was necessary to rely entirely on information published by the Dominion Bureau of Statistics and the National Harbours Board. The fact has already been stressed, that these reports are not the most desirable for this type of study.

Other published information, however, was of considerable value. For the historical background, "Early Shipping in Burrard Inlet" by Judge F. Howay, "The Port of Vancouver" by Tom McInnes, and "Rise of the Port of Vancouver, British Columbia" by Leah Stevens proved very helpful. For geological history and structure the two principal sources consulted were "The geology of Vancouver and vicinity" by E.M.J. Burwash and "Geology of the Fraser River map area" by W.A. Johnson. While this is not an urban study, certain aspects of urban geography were consulted. The main sources of information were "Railway and harbour report, Vancouver, B.C." by H. Bartholomew and Associates, a Town Planning consulting firm and "Vancouver: A Study in Urban Geography", a Master's thesis by Donald P. Kerr. Finally, a Master's thesis by G.M. Schuthe, "Canadian Shipping in the British Columbia Coastal Trade", and a report by Sir Alexander Gibb, "National ports survey, 1931-32", were frequently consulted.

All these reports deal with some special aspect of the
port and its activity, or include the port as part of a wider study. In no report or article is there a synthesis of the historical, physical and economic information on the port to show how, through the interrelationships of each, plus the favourable factors of location, it has grown to its present position.

The correlation of the results of work in other disciplines, plus careful field observation, and a final presentation substantiated by maps, is the method of the geographer. In this work the method is applied to a survey of the Port of Vancouver, which, it is hoped, will prove of interest both to geographers, as well as to those connected with the port. It is hoped that those of this latter group who read this, will have a greater understanding of the port and its activity.

For geographers, it is hoped that they will be able to profit from the difficulties encountered, and, at least in connection with statistical data, be warned of existing weaknesses. Perhaps in this way geographers in other countries who are stressing the importance of port studies might realize that in Canada the approach to the subject and the method of treatment is different from that, say of Europe. In several European countries, published statistics and available unpublished material are so extensive that an entirely different treatment of a port study is possible.

**Definitions**

As an aid to the understanding of certain shipping terms
used, the following definitions are supplied.

**Barge** - a schooner or other sailing vessel converted for use as a bulk cargo carrier. Decks, masts and rigging are removed to gain all possible hold space. This type of vessel, classed as unrigged, is towed by a tug. A barge as defined here is used almost exclusively in British Columbia and must not be confused with the specially designed barges so common on European rivers and the canals of England.

**Scow** - a rectangular, wooden, shallow draft bulk cargo carrier of the unrigged type. Scows vary in size from 30 feet by 90 feet, with a capacity of 375 tons, up to 36 feet by 100 feet with a capacity of 600 tons. For cargoes such as coal, sand, gravel, etc., open scows are used; for perishable cargoes such as cement or newsprint, a covered type is used.

**Tugs** - towing vessels which vary from small harbour tugs which average 30 feet in length and 165 H.P. to 135 feet with up to approximately 1400 H.P. The most common type is 60 feet long and between 300 and 500 H.P. The main basis for efficiency rating is the tug's ability to move economically 35 sections of logs or two scows.

**Gross Tonnage** is the internal cubic capacity of a vessel measured in units of 100 cubic feet of all the enclosed spaces in the ship, including both space below and above decks.

**Net Tonnage** is the residual tonnage after the various allowances for propelling power, crew space and navigation space, have been deducted from the gross tonnage.

**Harbour** is the natural feature such as a bay, inlet or
river mouth, which affords shelter from the open sea for shipping.

Port is the natural feature of the harbour, with, in addition, the necessary mechanical equipment and docking space for handling all types of shipping.
CHAPTER TWO

HISTORICAL AND PHYSICAL BACKGROUND

The Port of Vancouver is both a coastal and a world port of major importance. The growth of the port to a position of such significance results, in part, from the factors of location, suitable physical formation, available natural resources and quite rapid growth.

Location

Vancouver is situated on the south side of Burrard Inlet in southwestern British Columbia. This inlet, which extends eastward for almost 15 miles from English Bay, is the southern boundary of the Coast Mountains of British Columbia. To the east of Burrard Inlet low land allows easy access to the valley of the Fraser River, and so to the interior of the province. With the single exception of the railway from Squamish at the head of Howe Sound, there is no other practical route from the coast to the interior of the province between Vancouver and Prince Rupert 450 miles to the north. Even though the coastline is deeply indented by long fiords reaching, in places, many miles inland, access to the interior from the sea is barred by the Coast Mountains. This mountain mass with elevations of from 8,000 to 10,000 feet, backs the entire coastline from Burrard Inlet to the Alaska Panhandle (Map 1) and constitutes an effective barrier to any east-west movement.
Discovery of Burrard Inlet

Tradition, supported by the custom of the City of Vancouver, has it that Burrard Inlet was discovered by Captain George Vancouver in June, 1792, while searching for the Northwest Passage. In all probability, however, the inlet was first seen by a Spaniard, Jose Maria Narvaez in August, 1791.\(^1\) The discoverer of the harbour is unimportant, since no use was made of the area by Europeans until 1859.

Suitable Physical Features for a Major Port

This inlet, discovered by Narvaez or Vancouver, had all the natural requirements of a great port, plus the resources to attract settlement.

By far the largest part of the harbour is English Bay (Map 3) with an area of approximately 20 square miles. The south shore of the bay is lined with wide sandy beaches made

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\(^1\) McInnes, Tom. "The Port of Vancouver"; Canadian Geographical Journal, Vol. 2, No. 4, April, 1931, p. 239.
up largely from material carried along the shore by tides from the high clay banks which extend eastward almost 3 miles from Point Grey. The shallowness of the water over this area of beaches precludes any shipping activity. The north shore, in contrast, is rugged and rocky with many small bays where the water is deep enough that they are often used for shelter by fishing boats and tugs. At the eastern end of English Bay the low promontory of Stanley Park divides the bay: to the north the water-way is restricted to form the narrow entrance to the inlet beyond; to the south, the bay tapers gradually to a small, shallow, stream mouth called False Creek.

Beyond the narrow entrance lies the almost landlocked main harbour of Burrard Inlet. The excellence of this inlet as a harbour can be attributed to the fact that it is an ancient outlet of the Fraser River that was slightly over-deepened by glaciation.\(^2\) The over-deepening was not sufficient

to create the excessive depths found in fiords which make dock construction difficult, but it was great enough to leave sufficient depth of water for use as a port after post glacial emergence.

At the present time depths in the main harbour are ample for the largest ships afloat with the main controlling factor being the depth at the First Narrows (Lion's Gate) entrance. Here the maximum depth at low tide is 31 feet but tidal rises varying from 11 to 13 feet greatly increase the limits. By dredging, an average depth of 31 feet at low tide has been achieved at the principal piers.

With two major exceptions, depths considerably greater than 31 feet (slightly more than 5 fathoms) prevail over much of the harbour. The first exception is Coal Harbour at the western end of the harbour where the water is extremely shallow (Map 3). This shallow area extends northeastward towards Brockton Point. Between Brockton Point and the First Narrows, there is a second, but slightly less shallow area, that, with the tidal flats on the northern shore, tends to restrict the harbour entrance. The narrowness of this entrance has an advantage in that there is considerable scouring of the channel by fairly fast moving, tidal currents.

Tidal currents in the main harbour, while they do not constitute a great danger, at times cause difficulty to ships approaching or leaving piers. The flood, or rising tide flows

from First Narrows to the vicinity of Ballantyne Pier (Map 3). From Ballantyne Pier the main stream continues on through Second Narrows to the eastern portion of Burrard Inlet, while a back eddy flows from Ballantyne Pier to Coal Harbour. With the ebb or falling tide, the flow is reversed, the current moving from Coal Harbour towards Ballantyne Pier where it is joined by the current from Second Narrows which is moving directly out to sea. The greatest difficulty to shipping is caused by the back eddy with its actions around the various docks which are almost unpredictable from day to day, and their effect on moving vessels. The direct current through Second Narrows, while slightly more powerful, has not the unpredictable characteristic of the back eddy in the main harbour. Nevertheless, its effect must be taken into consideration for any movement, particularly of small shipping, through the Narrows at either the flood or the ebb tide.

Considerable care must also be used by small vessels such as pleasure boats and fishing boats, at the time of the ebb tide at First Narrows. In this narrow channel, when a west wind blows, waves can reach a height of six feet, which, combined with the strong current moving at between 4 and 5 M.P.H., can prove dangerous.

The southern boundary of the inlet is Burrard Peninsula, which consists of two long ridges. The northern ridge with a maximum elevation of 1135 feet, extends from Stanley Park eastward for 18 miles to the junction of the Fraser and Pitt rivers (Map 2). The southern ridge, with a maximum elevation of 400
feet, extends for 17\(\frac{1}{2}\) miles from Point Grey to Brunette Creek on the east.\(^4\) Between the two ridges lies an important lowland area which is divided between two minor drainage systems: to the west, False Creek which leads into English Bay; to the east, Still Creek, which flows to Burnaby Lake, and in turn Brunette Creek and the Fraser River. (Map 2)

This lowland area has been described by Burwash as another of the old outlets of the Fraser River,\(^5\) abandoned at the time of uplift of the land to the north of Burrard Inlet. The presence of the height of land at Grandview, cut through by the Great Northern-Canadian National rail line, might indicate rather that the two small streams are the remnants of somewhat larger, post glacial streams flowing in opposite directions from the watershed at Grandview ridge.

Both the ridges of Burrard Peninsula are deeply covered with glacial drift which has afforded an excellent foundation for the building of a city. The northern ridge slopes gently to the waterfront of Burrard Inlet.

On the north side of the inlet the steep slopes of the Coast Mountains are covered with glacial drift from approximately the 1,000 foot level -- and even higher in some of the mountain river valleys -- down to the shore line which consists largely of tidal mud-flats. These flats result from deposition by Capilano, Lynn and Seymour Creeks, three streams.


\(^5\) Burwash, *The geology of Vancouver and vicinity.* p.11.
that flow down the steep mountain side through the layer of glacial drift, and thus carry a considerable load of material to be deposited in the waters of the inlet.

Photo. 3. Glacial deposits, north side of Burrard Inlet.

These mud-flats are relatively undisturbed by tidal action. With both the rising and the falling tide, the current which runs close to the south shore tends to scour clean this portion of the harbour while the more gently sloping northern shore accumulates large mud-flats.

Photo. 4. Tidal mud-flats, north shore of Burrard Inlet.
First Attempts to Develop Natural Resources

When Burrard Inlet was discovered in the 18th Century, the peninsula on the south and the lower mountain slopes on the north, were completely covered by stands of some of the finest timber in the world. Yet, in spite of such forest resources so easily accessible, the first attempt at resources development was coal mining at Coal Harbour, in the southwest part of Burrard Inlet. This was attempted in 1859, a few years after the successful opening of the first coal mines in Nanaimo. The venture failed because of the thinness of the seam.

Three other ports were in existence by 1859; Victoria, the Hudson's Bay Company centre on Vancouver Island; New Westminster, the port of entry for prospectors heading for the gold fields of British Columbia; and Nanaimo, the coal mining centre on Vancouver Island. Thus it would seem that there were sufficient ports for the young, unsettled territory. Such was indeed the case, but sufficient attractions existed in and around Burrard Inlet to make it the site of a fourth coastal settlement in southwestern British Columbia. Coal had been a failure in itself, but it attracted, in 1862, a search for pottery clay by an Englishman, John Morton, who was accustomed in England to finding coal and good pottery clay together. This too failed, but finally the forests were recognized as the major local natural resource. In 1862,

6 McInnes, "The port of Vancouver". p. 304.
T.W. Graham secured a lease of 420 acres of forest land on the north shore of Burrard Inlet, and in 1863 the Pioneer mill began operation⁷ at Moodyville, now a part of North Vancouver.

Though some success in resources development had finally been achieved, a full exploitation without rail connection was impossible for the early lumbermen of Burrard Inlet. Thus it must have been, that the excellent qualities of the inlet as a natural harbour with a location for a settlement on its south shore, and with such a large source of lumber so readily available, bulked large in their imagination and planning. To the north there were many other inlets -- long, steep-sided fiords with deep water -- where forest resources were equally as good. These areas were only developed later as the forests of Burrard Inlet were exhausted and more advanced methods of logging and transportation were devised to deal with the different type of terrain and the distances involved.

Settlement and Growth

The three factors, the natural harbour, the forest resources and the settlement site, were the primary attractions to Burrard Inlet in the early days of its settlement and growth. These attractions alone, it is true, were not sufficient to place the new settlement on a par with the major competitors, Victoria, Nanaimo and New Westminster. The ability to compete and the eventual supremacy came after many years of growth and

the construction of the railway. New development concentrated nevertheless on the basic elements of forest resources, excellent harbour and good building site.

In addition to the advantages of resources, harbour and site, much of the success of Vancouver as a young settlement and a considerable amount of its rapid growth depended on the proximity of the agricultural lowlands of the Fraser Valley. Both Vancouver and New Westminster relied on this area of fertile agricultural land for a large part of their food supply. To-day it represents one-quarter of the developed agricultural land of the province and, though only 58% of its half million acres is suitable for agriculture, it nevertheless still supplies an important part of the local needs of dairy produce, vegetables and fruit. One significant result is that Vancouver is not entirely dependent on a distant source of supply for all the food that is required. Where complete reliance on a distant source of supply for fresh foods does exist, as in the case of Prince Rupert for example, rapid growth and development are difficult, if not impossible.

The growth of the port resulted from lumbering, the building of the railway to Vancouver and finally the opening of the Panama Canal. The opening of the first mill in 1863 was followed in 1865 by the establishment of a second mill at Hastings, and in 1869 the beginning of the settlement at Granville.\footnote{Sage, W.N. "Vancouver 1856-1946". Journal of Commerce Year Book, 1946. p. 108.} This was the start. Not only was there industry
established on the inlet, using local resources, and also the beginnings of a settlement, but the inlet, as a sheltered harbour, was being used for the sailing ships that took lumber to the Orient, to South America, and to Europe. It was the building of the railway however, that proved to be the major stimulus to the growth of the city and its port.

Building the Railway

The primary factor governing the construction of the Canadian Pacific Railway to British Columbia was political; but the factors dictating the choice of Burrard Inlet for the Pacific Terminus were primarily physical and economic.

One result of the negotiations culminating with British Columbia entering Confederation in 1871, was the promise that the province would be linked with the rest of Canada by rail within ten years. Though this time limit was not met, the line being finished and ready for use to Port Moody in 1886, the political incentive was nevertheless of importance.

With the political agreements decided and financial problems solved, the major difficulty remaining as far as the British Columbia section of the line was concerned, was the choice of a route through the mountains. Of the three, passes through the Rocky Mountains that are suitable for a railroad—Yellowhead, Kicking Horse and Crowsnest -- the Kicking Horse was chosen. The principal reason for this choice was that the Kicking Horse Pass led not only through the Rocky Mountains, but also to Rogers Pass in the Selkirk Mountains -- a pass
unknown until discovered by the railway surveyors — and so to the somewhat lower elevations of the Shuswap Lakes on the edge of the Interior Plateau. From the Shuswap Lakes the line followed the Thompson and Fraser Rivers to the sea. (Map 1)

The route chosen led to the natural Pacific coast terminal region of the Lower Fraser Valley. This region, extending from the sea to Hope on the Fraser River, is the largest area of level land on the coast of British Columbia. Two settlements, Granville -- later Vancouver -- and New Westminster were already in existence in the area; agricultural land to compliment a growing population was available; the lumbering industry, while small, was established; and finally, this lowland at the end of the Fraser Valley provided the only readily accessible approach to the Pacific Ocean. This then, was the natural outlet for the new transcontinental railway.

Suggestions for a possible terminus city in southwestern British Columbia varied from New Westminster, to Port Moody and even Victoria on Vancouver Island. The final choice in 1886, was Port Moody at the head of Burrard Inlet.

This proved to be a very unsatisfactory location. One of the major purpose of the railway, that of linking with ocean shipping, was defeated by the shallow water at Port Moody. While the water of the eastern part of Burrard Inlet is, on the whole, deep enough for shipping (Map 3) the waterfront at Port Moody is made up almost entirely of a wide tidal mud-flat. A further disadvantage was the limited area for the building of a large settlement in comparison with the excellent
site at the western end of Burrard Peninsula. In addition, the western part of Burrard Inlet was already being used to some extent by shipping and lumber mills and there was an already existing settlement at Granville.

The settlement of Granville had grown sufficiently that by April 6, 1886, it had been incorporated as the City of Vancouver. This was followed by the extension of the railway from Port Moody in 1887 following negotiations in 1886 between the Canadian Pacific Railway Company and the Provincial Government. As a result of the negotiations, the government made considerable land grants to the railway company. These grants included: the right of way along the south shore of the inlet; 39 lots in Granville townsite of the City of Vancouver; lot number 541 of 480 acres, extending from the north side of False Creek to Burrard Inlet; the whole of lot number 526 consisting of 5,795 acres in what is now one of Vancouver's finest residential areas.

With the exception of the right of way along Burrard Inlet, this land was deeded to the company for re-sale to cover the cost of the extension from Port Moody, and the building of workshops, a terminus on Burrard Inlet and railway yards within the city. The only large extent of land still held by the company is situated on the north side of False Creek (Map 3) where the company now has a large assembly yard and repair shop.

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While this location of the yards has eliminated much of the area from possible industrial use in conjunction with the rest of False Creek, considerable advantage is gained in having an assembly area for both passenger and freight cars so close to the terminus on Burrard Inlet.

The possession of the 39 lots in Granville town site and the 5,795 acres of lot number 526 meant that the railway company could regain at least a part, if not all of the financial outlay involved in the extension from Port Moody and the necessary construction. This proved to be sufficient incentive for the Canadian Pacific to develop its holdings in Vancouver to the status of a major railway terminal with the resultant growth of both the city and the port.

The Panama Canal and Western Wheat

One final step was still to be taken, however, before the Port of Vancouver could hope to achieve functional maturity. Up to this stage of its development the port was, to all intents and purposes, a Pacific port. Potential European markets, reached by way of Cape Horn or the Suez Canal, were too remote for Vancouver to create severe competition to the ports of Eastern Canada and the United States Atlantic sea-board. The Panama Canal changed this unfavourable relationship. True, there was little noticeable difference immediately following the opening of the canal in 1914 because of the wartime lack of shipping, but the new potentialities nevertheless existed to Vancouver's advantage. Vancouver was visualized as an all-
year outlet for Western wheat, destined not only to Pacific markets, but to British and European markets as well, because of a decrease of 5,600 miles to Liverpool via Panama rather than via Cape Horn.\(^{11}\) Despite the attractions of all-year navigation there were major obstacles to overcome, one of the greatest being the misconception that wheat could not be shipped in bulk through the tropics. As the greatest part of Canadian wheat was shipped in bulk, this could have remained as a major obstacle were it not for tests conducted by chemists of the Grain Research Laboratory. In 1918 and 1919 five ships, loaded with a total of 800,000 bushels of wheat, sailed from Vancouver. Each ship carried a chemist who made daily tests of the condition of the grain.\(^{12}\) The great success of this experiment partly eliminated old objections to the new route. Other prejudices, most notably those of established grain exporters, shipping and handling agencies, and the railroads, had yet to be overcome in favour of the Western route. It was a long struggle ending in 1927 with an eleven cent per bushel reduction in freight rates from Calgary to Vancouver.\(^{13}\)

The success of the campaign to develop wheat shipments from Vancouver is reflected to-day in the storage facilities available in the port. From a small beginning of one elevator


\(^{12}\) Stevens. "Rise of the port of Vancouver, British Columbia". p. 64.

\(^{13}\) Loc. cit.
with a capacity of 1,250,000 bushels in 1923, capacity increased
during one eighteen month period of 1923 and 1924 alone, to
6,500,000 bushels. By 1933, when the last one was built, there
were seven elevators with a total capacity of 18,716,500
bushels.\textsuperscript{14}

\textbf{Location Factors for Lumber and Wheat}

While the fight was being waged to gain the wheat ship­
ments, lumber had continued its growth from the early start at
Moodyville and Hastings, and as the industry grew, more of the
waterfront of the port was occupied. In general the areas
chosen were those where there was no great depth of water, the
reason being that the booms of logs and the vessels that moved
them to Vancouver, were of a shallow draft. In addition, the
areas of shallow water in the port were generally those with a
gently sloping shore line. Two such areas are the north side
of Burrard Inlet, lined by tidal mud-flats, and False Creek,
where, at low tide, the water is almost everywhere less than
20 feet deep.

Other attractions of False Creek to the lumber industry
were Granville Island and the False Creek flats to the east.
Granville Island was reclaimed by the Vancouver Harbour Com­
mission in 1916, the False Creek Flats jointly by the
Canadian National Railway Company and the Great Northern Rail­
way Company in 1917.

\textsuperscript{14} Stevens, "Rise of the port of Vancouver, British
Columbia". p. 65.
The factors controlling the location of grain elevators were proximity to a railway line and the waterfront and sufficient depth of navigable water for deep-sea freighters. The only location combining all these requirements was the shore of Burrard Inlet in the area that is now the main port waterfront to the west of the Second Narrows. With one exception the elevators are all situated on the south shore close to the railway line that follows the waterfront, and are all easily accessible to ships lying at loading berths. In some cases the elevators are on piers and supply grain direct to ships. In other cases, where the elevator stands a short distance from the dockside, overhead conveyors move the grain to the ships without interfering with traffic moving along the waterfront. The one exception is the large elevator on the north shore which stands on its own pier and thus has direct supply to ships. This area is served by a railway line operated by the port management.

The construction of grain elevators and new docks pr-
cluded the expansion of the lumber industry in the immediate port area, at least on the south side of the inlet. This necessitated the increased development of the industry in the False Creek area, with the resulting division into Burrard Inlet for grain and deep-sea ships, False Creek for lumber. Thus it was that the original industry that first attracted world shipping, continued almost in partnership with the new world trade in wheat. Lumbering of course increasingly attracted allied industries with the final result that ships coming to Vancouver for either grain or lumber, or both, found added diversity of goods with which to make up full cargoes.

The Harbour Commission

Prior to the First World War, with lumber as the lone major industrial incentive, development of port facilities was slow, the little that was accomplished being done by a few individuals or the Canadian Pacific Railway. The need for a central authority not only to administer and legislate, but also to build, was met by the formation of the Vancouver Harbour Commission in 1913. This commission, operating under the Federal Department of Marine and Fisheries (now the Department of Transport) administered the port through the period of growth and construction, and deserves much of the credit for the importance of the port to-day. Under the Commission's leadership, new docks, a terminal railway, and grain elevators were built, at the same time that ships began using the port in increasing

15 Harbour and Shipping, February, 1944. p. 50.
numbers. The duties, responsibilities and property of the Commission were taken over in 1935 by the Vancouver section of the National Harbours Board, which is now the governing authority within the port.
CHAPTER THREE
THE PORT TO-DAY

There are certain commercial requirements that are essential if a port is to achieve greatness among shipping centres of the world. These requirements are: large numbers of ships arriving and departing; quantities and varieties of commodities moving through the port; adequate facilities for handling and storing; rail connections to move goods and passengers both to and from the port. These commercial activities are more efficient in their operation if, as in the case of the Port of Vancouver, different subdivisions of the port area, with slightly different physical features, are easily adaptable to the varied commercial activities.

Divisions of the Port and their Main Uses

There are four main subdivisions of the port area:
(Map 3) English Bay; the main harbour between Lions' Gate Bridge and Second Narrows Bridge; the eastern harbour, consisting of Burrard Inlet from Second Narrows to Port Moody plus Indian Arm to the north; and False Creek.

English Bay

English Bay lies between the western boundary of the port area and First Narrows (or Lions' Gate). It serves as an anchorage ground for ships when necessary and near the south shore there are fixed mooring buoys for log booms and scows. Almost the entire southern shoreline with its sandy beaches,
suitable for swimming, is used for recreational purposes. In addition there are two yacht clubs, the Royal Vancouver and the Kitsilano, plus excellent swimming pools at Kitsilano and at Second Beach in Stanley Park.

The north shore of the bay, which is in the Municipality of West Vancouver, is used extensively for residential purposes. The many bays and coves in addition to affording shelter for small vessels, are also as popular for bathing as the south side of the bay. Unfortunately the entire area of English Bay is subject to a considerable amount of pollution resulting from the dumping of sewage and some industrial waste directly into the harbour, principally from the industrial areas in the port.

The strong tidal currents through the First Narrows carry this refuse into English Bay where, with less disturbance from the currents, it tends to accumulate. Large amounts of refuse, particularly driftwood, is washed up on the beaches as a result of incoming tides and waves. Some attempt is made each summer by the city to remove the driftwood and thus improve the condition of the beaches for recreational use, but it accumulates each year as a result of winter storms and generally higher winter tides.

**The Main Harbour**

The second subdivision is the main harbour between First Narrows Bridge on the west and Second Narrows Bridge on the east. Within this area (8 square miles) are the multitude of installations and facilities necessary for the operation of a
The majority are on the south side of the harbour, due in part to the fact that the original settlement was made on the south shore where there is considerably more level land than is found in North Vancouver. Even more significant however, is the topography of the southern side which makes the area highly suitable as a port waterfront. The shoaling nature of the mud-flats built up by the three rivers of the north shore, preclude deep-sea shipping for much of the area, unless expensive dredging is carried out. In contrast, the water close to shore on the opposite side is deep due to the glacial over-deepening, the absence of depositing streams, and the scouring effect of strong tidal currents that parallel the shore with both the ebb and the flood tide, thus preventing any great degree of deposition.

At the eastern end of the main harbour is Coal Harbour. Because of the protection afforded by Brockton Point and Deadman Island (Map 3) and the shallow water of the bay, small boat activity has become concentrated here. Originally Coal
Harbour extended almost to English Bay, but a causeway was built cutting off the western portion, which became known as Lost Lagoon. In addition to the Royal Vancouver Yacht Club and the Vancouver Rowing Club, there are several small shipyards, boat repair docks, storage docks and tug and fishing boat berths occupying almost all the shoreline of Coal Harbour. As a further attraction to small boats four petroleum companies have floating service stations anchored to the east of Deadman Island.

Photo. 7. Floating gas stations.

The main shipping and industrial area of Vancouver Harbour is concentrated on the south shore of the inlet from Coal Harbour to Second Narrows. The Canadian Pacific Railway Company's deep-sea and coastal shipping docks are the first major installation to the east of Coal Harbour. Because of the necessity of passing around Brockton Point to reach them, these wharves (Pier A and Pier B.C) were built at an angle pointing slightly away from the harbour entrance. With sufficient depth of water and manoeuvring space farther east, such
construction is not necessary and with two exceptions the docks have been built pointing straight out into the harbour to give any possible advantage of greater depth. The two exceptions are the Terminal Dock and the Alberta Pool Elevator Dock. These lie at the narrow eastern end of the harbour and were built almost parallel to the shore to prevent blocking of the Second Narrows. This position also facilitates docking and clearing in this area of rapid tidal currents.

The main installations on the north shore lie between the two large areas of tidal flats (Map 3). Here the greatest part of the waterfront equipment is devoted to shipbuilding and ship repair. During the First World War, when shipbuilding reached very large proportions in Vancouver, the most favourable locations for such an industry on the south shore of the harbour were occupied by other port facilities. The need for deep water within the harbour limits led, therefore, to the establishment of the industry in its present location. This is the only area of deep water on the north shore, and it is occupied almost entirely by shipways, floating dry docks and marine railways which are used, in peace time, almost exclusively for ship repair rather than shipbuilding.

The mud-flat areas are used extensively as booming and storage grounds by the lumber mills of the north shore. At high tide the water over the flats is deep enough that booms or rafts of logs can be brought in and moored to rows of dolphins or wooden piles. It is here that the rafts are broken up to be sorted by ownership and by species if necessary. When
the tide ebbs the logs are exposed to the air thus killing teredo worms which do extensive damage to logs that have been a considerable time in water.

Photo. 8. Logs on tidal mud-flats.

The Eastern Harbour and Indian Arm

The third subdivision includes all the area east of the Second Narrows, consisting of Burrard Inlet to Port Moody and Indian Arm, with a total area of almost 20 square miles.

This portion of the harbour, and in particular the northern extension, has very much the appearance of a fiord. The sides of the inlet are more precipitous than the main harbour area and there is considerable evidence of glacial erosion. In the northern arm the most typical fiord-like characteristics are the depth of the water, which varies from 300 to almost 700 feet, and the steep rocky sides with elevations of from 2,000 to 5,000 feet. With the exception of the extreme eastern end of the inlet beyond the six fathom line (Map 3B) and the tidal flats to the east of Second Narrows, the entire area has sufficient depth of water for use by deep-sea shipping. A major handicap to greater use of the area by shipping is the narrow
entrance at Second Narrows where tidal currents both with the flood and the ebb tide reach a speed of between 6 and 7 miles per hour. This rapid current prevails for only a quarter of a mile on each side of Second Narrows, the rest of the eastern harbours and Indian Arm being little affected by tidal flow.

In this section of the harbour petroleum refineries and storage tanks are the main industrial establishments. Six companies (Map 3B), Imperial, Union, British American, McColl Frontenac, Shell and Standard are located in this area. Lower taxes on large areas of land necessary for this type of operation, and the desirability of relatively unsettled areas outside the main port, for safety reasons, are two considerations that attracted the industry to this particular area. Other considerations were the need for sufficient depth of water to accommodate deep-sea oil tankers, and sufficient slope for gravity feed from storage tanks to barges and coastal tankers.

Sawmilling is the only other activity of any importance in this part of Burrard Inlet. There are four lumber mills and two shingle mills, all located east of the entrance to Indian Arm. This area is the nearest one possible on the waterfront to the source of supply of lumber on Indian Arm and to the east of Port Moody. In addition the Canadian Pacific Railway line follows the shore of the inlet so closely that waterfrontage is available only in this eastern part of the inlet.

With the exception of two rock quarries (Map 3C) which are the main source of supply of rock for the jetties at the
mouth of the Fraser River, and a subsidiary hydro-electric
station, Indian Arm is almost exclusively used for resort pur-
poses. The main resort area is Deep Cove, but there are many
small summer homes along the steep shoreline of the inlet.

False Creek

False Creek is the final subdivision of the port area.
This narrow, dirty, overcrowded waterway, is the main indus-
trial area of the port. With the growth of the grain trade in
the years following the first shipments in 1920 and 1921, in-
dustry moved to this waterway from the waterfront area of the
main harbour. At that time, when the city of Vancouver was
considerably smaller than it is to-day, and when slower trans-
portation necessitated the location of industry near residen-
tial and commercial areas, no great difficulty existed. To-day
it is the "problem area" of the city. Almost surrounding a
square mile of water are crowded sawmills, processing plants,
warehouses, wharves and railway yards. Because of the shallow-
ess of the water in False Creek -- 20 feet and less at low
tide -- only small boats and tugs with scows or log rafts can
use the waterway. Even for many of these, the low level
vehicular bridges that cross the inlet at Granville Street and
at Cambie Street, must be opened. This is a serious hindrance
to the rapid movement of streetcars, buses and automobiles
that must cross the inlet in travelling between the commercial
area of the city and the main residential areas. The high-
level Burrard Street Bridge eliminates some of the traffic
delay, and still further improvement will result from the proposed high-level Granville Street Bridge. Until this latter thoroughfare is completed, however, the existing low bridges will continue to cause lengthy delays to both traffic and shipping.

Growth of the Port

The future of the port of Vancouver was indicated, all unknowingly to the men responsible, by the first successful use of a natural resource on the inlet. From the small beginning in 1863 and 1865, the first two sawmills had grown sufficiently that by 1876, fifty ships left the inlet with approximately 30,000,000 board feet of lumber and 1,000,000 feet of spars.¹⁶ Thus lumber exporting, as one phase of future development, was established.

The second major advance in the value of the port appeared with the arrival in September, 1886, of the first trans-

Pacific cargo from the Orient for shipment overland by rail.\textsuperscript{17} It is true that trans-Pacific shipping with cargoes for eastern Canada would be attracted to almost any port on the British Columbia coast that possessed a rail link with the east. Nevertheless the trend was indicated, and was even further strengthened with the granting of a trans-Pacific mail contract to the Canadian Pacific Railway by the British Government in 1889.\textsuperscript{18}

It was the increase of the wheat export that started the growth of the port towards a position of world importance. The faith of a few men in the possibility of Vancouver as a wheat shipping centre, in the face of strong opposition from many sides, finally resulted in the port achieving its present position. This final result came about because lumber retained its former importance and even increased in quantity of both imports and exports as more ships, attracted by wheat, came to the port for cargoes of both grain and lumber. Even in depression years when shipping and lumber export both declined, wheat shipments remained important, and in fact even reached a maximum in 1932, as is indicated by Table 1.\textsuperscript{19}

\textsuperscript{17} Annual Report of the Harbour Commissioners of Vancouver, 1920, p. 5.
\textsuperscript{18} Sage, "Vancouver", p. 110.
\textsuperscript{19} Figure 1 and following statistical presentations in Chapter 3, cover the period 1921-1935. This represents both the period of greatest growth before the Second World War -- the period in which the Port of Vancouver became established -- and the period of administration under the Vancouver Harbour Commission. From 1936 the port has been under the administration of the National Harbours Board. During these latter years a combination of world economic and political situations plus a different form of statistical presentation, make comparisons difficult. To add to the difficulty of any statistical presentation, in many cases there is no information for the year 1930.
Once a start had been made with wheat and lumber, there followed a steady growth of the port. The meagre grain storage capacity available in 1923 (1,250,000 bushels) was not enough for the shipments planned in the future. New elevator construction led to new docks, dockside equipment, and greater ability and efficiency of conducting the activity of a port. This in its turn served as further inducement to shipping companies to use Vancouver. From this early period of growth, it is exceedingly difficult, if not impossible, to determine which are the most important factors or in what sequence they appeared to contribute to the growth of the port. The important elements to consider in trying to assess the growth of the port are: the increase in numbers of ships using the harbour; the relationships with various outstanding world market-areas; and the appearance of more and more diverse commodities. Because of the difficulty of separating them, determining their relative importance and placing them in an acceptable order, they are presented in graphic form on pages 40 and 41.

In the case of Table 1, not only the annual total of ships arriving in Vancouver is given, but also the country of origin. While it cannot be assumed that a ship returns to its country of registry, the figures do show a growth of interest by other countries in the cargoes available in Vancouver. At the same time there is a relationship between these figures and Map No. 4, which shows the principal markets for exports and sources of imports that pass through the port of Vancouver. Table 2 indicates the principal commodities exported between
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Source: Vancouver Harbour Commissioners Annual Reports, 1921-1934.
1921 and 1935, and at the same time shows a steady growth in the number of commodities exported. This is by no means a complete list of export goods for the period 1921 to 1935, but rather the listings given in annual reports as each category reached significant proportions.

In the final analysis these three illustrations show a growth of both shipping and tonnage up to the years of the depression, and an establishment of certain foreign areas as regular markets for exports and sources of imports. Also noticeable is the fact that while the number of ships and export tonnage fluctuated as a result of economic depression, the areas delimited in Map No. 4. maintained their relative positions to a considerable degree.

A final aspect of the growth of the port can be illustrated with the movement of passengers. As is so often the case, statistical information again is very sketchy and a division into coastal or deep-sea passenger movements is not always possible. However, sufficient information is available to indicate an increase in passenger movement from Vancouver between 1921 and 1929. This increase was followed by a decline during the early depression years, and in turn, by a slight increase before the Second World War. The entire period following 1921 is characterized by a steady decline in deep-sea passenger movements, Vancouver at no time having a large total in comparison to the coastal passenger figures.

Much of the coastal passenger traffic for each year can be accounted for as tourist movements in the summer months,
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</tbody>
</table>

Source: Vancouver Harbour Commissioners, Annual Report 1934.

1 No data available.
particularly between Vancouver and Vancouver Island. A second important contribution to the growth of passenger movement resulted from the increase development of coastal settlement.

Table 2 shows an ever-increasing list of commodities exported from Vancouver. Of the fifteen commodities listed, nine of them — lumber, paper, pulp, shingles, doors, canned fish, processed fish, fish meal and fish oil are produced in the coastal area of British Columbia. When the development of these resources first started, sources of supply close to the port sufficed, but with the increase of shipping and exporting that followed 1921, greater supply areas were needed, with the result that centres of production moved to coastal sites, leaving to the larger cities much of the processing stages of both forestry and fishing industries.

The growth of coastal settlements led to an increased dependence on Vancouver as a supply centre. This in turn contributed greatly to an increase in coastal passenger movements.

Major contributions to the importance of a seaport are the number of ships served, the ships being attracted by the facilities and services offered, as well as the cargoes available for export, and the demand for cargoes imported. Equally important to the port are its hinterlands and the industry within its own limits, to process the goods of those hinterlands. This aspect, in turn, demands certain local conditions either natural or man-made. Therefore, growth as experienced by Vancouver depends on the interrelationship of the two phases which cannot be placed in any chronological order: the increase
in numbers of ships, tonnages handled, markets and passenger movements; the development of industry, not because of the demand only, but also because of the local factors permitting it.

Industry in the Port

Location, or site, is perhaps the most important local factor, with a conditioning factor being the location of rail and road communication to industrial sites. In a port area the proximity of rail and road connection to shipping is also important. A further prerequisite common to all industry is power and considerable advantage is gained if more than one type of industrial power is available. A final requirement is the maintenance of a labour force, which grows in response to the demands of industry.

All these requirements are met, to a greater or less degree, in Vancouver and its port area.

Of the major industrial areas of Vancouver, one zone lies outside the port area. The one exception is the industrial zone in the lowland of the Burnaby Lake area. (Map 2) This zone enjoys the advantages of rail and highway services but, as is so common throughout the waterfront area as well, level land is scarce. The greatest disadvantage in the area is the necessity of deep piling. The lowest level, consisting mainly of peat, is the partially abandoned bed of a once larger Burnaby Lake. To gain a firm foundation for industrial construction, piles have been driven to a depth of over 50 feet.

The industrial zone within the immediate port area con-
sists of two main areas; False Creek with the two reclaimed areas of Granville Island and False Creek Flats; and the waterfront facing on Burrard Inlet.

When the False Creek area was first used for industry the principal advantages were that it was near the city and it was on water navigable by shallow draft vessels. Because of the sloping nature of the shore, considerable piling and filling in behind piles was necessary to build up sites not too far from the edge of the water. Additional space for industry was provided by the reclamation of False Creek Flats and Granville Island (Map 5). On Granville Island there are 20 lots varying from 50 feet to 60 feet in width and 200 feet to 300 feet in depth, each lot with either water frontage or rail connection.

The second main industrial area lies along the waterfront on both sides of the main harbour section of Burrard Inlet. On the south side of the inlet, because of the steeper shore, the firm layer of glacial deposits and deeper water, difficulties of industrial location were not nearly as great as in False Creek or on the north shore. In some areas filling was necessary but the task was not as great as on the north side of the inlet. On the latter shore the major obstacles to be dealt with were the tidal mud-flats which restrict the foreshore in its industrial use. Within the limits of the City of North Vancouver, however, (Map 5) considerable reclamation has been carried out and the new area used for both industry and shipping.

A minor portion of the Burrard Inlet industrial water-
front lies to the east of the Second Narrows Bridge. Here the combination of deep water, steep slopes and firm foundation have been adopted for use primarily by petroleum refineries.

Lying between False Creek and Burrard Inlet is a commercial and industrial area that links the two sections, but, because it lies on the landward side of the gently sloping, drift covered, northern ridge, does not suffer from the inherent weaknesses of tidal mud-flats, peat, or steep slopes found in other areas. This commercial-industrial area linking False Creek and Burrard Inlet, is a diversified one. Because it is close to the main commercial area of Vancouver, there are a few retail stores, but wholesale warehouses and distributing firms are more common. Intermixed with these are poor housing, small shops, and a number of light industries which produce such commodities as paint, paper and cardboard, light machinery and building materials.

Location near means of transportation by water or rail has been a major factor in the choice of industrial areas. For those industries on the waterfront, a connection has been provided with different forms of shipping which are in turn, dependent on depth of water and space for movement. Without railway facilities that link all the industrial areas, however, none of the areas would have achieved a maximum development.

**Railway System**

The railway network, linking the sections of the port and connecting Vancouver with New Westminster and in turn with the rest of Canada and the United States, is complex (Map 5).
Five railway companies, Canadian Pacific, Canadian National, Great Northern, British Columbia Electric and Pacific Great Eastern, either own right-of-ways and operate their own equipment or move their equipment over the lines of another company, under joint agreement, or, as in one case, lease lines to another operating agency — the National Harbours Board — and move no rolling stock of their own over the lines.

The Canadian Pacific Railway is the major rail company within the port and, in conjunction with the Terminal Railway of the National Harbours Board, supplies rail service to both sides of Burrard Inlet. From the Canadian Pacific yards on the north side of False Creek, the British Columbia Electric Railway moves cars to Granville Island, a portion of the south side of False Creek, and to the New Westminster area. The remainder of the south shore of False Creek is linked by the Great Northern Railway to the combined Canadian National—Great Northern marshalling yards at the eastern end of False Creek. This area is in turn joined to the Burrard Inlet waterfront by a short line operated jointly by the National Harbours Board and the Great Northern Railway Company.

Not only does this railway network join all the industrial areas but it also meets the primary need within a port, of providing rail connections direct to ships. In this way, one of the major functions of a port, its ability to link different modes of transport, is fulfilled. Indeed this last function is further reinforced through the use of first class highways which also join all the industrial areas of Burrard
Peninsula with each other, as well as with the waterfront (Map 9).

**Industrial Power**

The third prerequisite of industrial development is power. In Vancouver one utility company, the British Columbia Electric Railway Company, supplies both electricity and gas to the entire Burrard Peninsula. The company has five main hydroelectric production centres with a combined capacity of 377,800 kw. (506,434 H.P.).\(^{20}\) This output is sufficient not only for all present demands from both industry and port installations, but also to supply some reserve power to the Northwest Power Pool which covers the states of Washington, Oregon and western Idaho.

Coal gas is the second industrial power supplied by the British Columbia Electric Railway Company. Using coal principally from the mines of the Comox-Courtenay area of Vancouver Island, the company provides gas for the entire Burrard Peninsula. Two plants are in operation, one with a daily production of 15,750,000 cubic feet, and a reserve plant with a daily production of 4,000,000 cubic feet.\(^{21}\) Gas is used primarily by the metals industry but not too excessive demands from other industries can readily be met. As gas gives a more rapid heat than electricity, and the equipment is more easily installed, cheaper to operate, and governed by less stringent

\(^{20}\) British Columbia Electric Railway Company, Ltd. letter to the writer, 26 November, 1951.

\(^{21}\) Loc. cit.
regulations, a greater use is possible in the future. Future uses will undoubtedly increase with the piping of natural gas from Alberta to Vancouver. Unfortunately, even though one of five projected gas pipe lines from Alberta has been approved, there will be considerable delay in construction.

**Labour**

The final requirement of industry is an adequate labour supply, not only attracted to the area but increasing in numbers in proportion to the demands from industry. Figure 1, which shows the rate of the increase of Vancouver's population, and employment index, indicates a rapid growth of population between 1922 and 1931. During the depression years employment fluctuated and in fact showed a decided decrease until 1933. After 1933 however, the employment index rose rapidly, at a greater rate than the population increase. This would indicate that as industry expanded, it absorbed those who had contributed earlier to the rapid population increase. The increase in employment following 1933 would also include those who lost jobs during the period from 1930 to 1933 when the index declined.

**Growth of Services to Industry**

Suitable local factors permitted the growth of industry in response to external stimulants of increased shipping and new markets. A symbiotic development ensued, more facilities for industry in the form of extended railroads, increased industrial power and a larger labour force, reinforcing the growth of shipping, increase in export and import tonnages,
RATE OF INCREASE OF EMPLOYMENT AND POPULATION 1922-1951.

EMPLOYMENT
1939 INDEX=100

Employment Index

Index of number of payrolls.

Comparison of Rates of Growth

Vancouver

Province

FIGURE 1.
and diversification of commodities shipped.

Unfortunately, it is impossible to present, in a statistical form, information on increased rail facilities. Some information was supplied by the Great Northern Railway Company, the least important of the three major railway companies operating in Vancouver. The most significant information was that "There have been numerous industry tracks placed since 1920 ....".

In the case of industrial power, which is a guide to increased industrialization, definite information of expansion since 1920 is available.

<table>
<thead>
<tr>
<th>TABLE 4. INCREASE OF INDUSTRIAL POWER - VANCOUVER, 1920-51</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electricity</strong></td>
</tr>
<tr>
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</tr>
<tr>
<td>1920</td>
</tr>
<tr>
<td>1930</td>
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<td>1940</td>
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<tr>
<td>1948</td>
</tr>
<tr>
<td>1951</td>
</tr>
</tbody>
</table>

Source: British Columbia Electric Railway Company, Ltd. letter to the writer November 26, 1951.

22 Extract from a letter to the writer from the Reports Branch, Canadian National Railways. November 1, 1951.

"I regret to advise you that statistics are not readily available and that gathering them would involve a tremendous amount of research ....

Our Vancouver representative approached appropriate officials of the City of Vancouver, the Board of Trade, the National Harbours Board, the Deputy Minister of Railways for British Columbia, the Department of Trade and Industry and the railway companies and they all regretted that the information was not available."

NOTE: No information has been received from Canadian Pacific Railway.

23 Great Northern Railway Co., Saint Paul, Minnesota. Letter to the writer, October 25, 1951.
Types of Industry and Their Location

Four types of industry developed in Vancouver with some degree of control by local factors on the location of each. The four types are primary, secondary, supply and supporting.

The primary industries, shipbuilding, lumber, fish processing and oil refining, are located on the waterfront. In some cases waterfront location is an obvious necessity as in the case of shipbuilding; in other cases — lumber mills, fish canneries and oil refineries — location is a result of the mode of delivery of raw materials.

The three remaining types of industry are located on the waterfront if possible, but it is not essential. Particularly is this the case with the secondary industries such as plywood and veneer mills, furniture factories, planing mills, box and crate factories, to mention the most important. These are virtually a subdivision of the main lumber industry and, as they rely on the sawmills for their raw material they have grown up in the port area.

The supply industries are meat packing, baking, production of dairy goods, brewing and distilling. As these industries supply the needs of the population in the whole metropolitan area, they are not necessarily on the waterfront. In a port however, some of them such as breweries, distilleries and meat packing plants, would use waterfront sites if they were available.

The final division includes the supporting industries. The principal industries in this group are machine shops,
machinery manufacturing, sheet metal plants, tool manufacturers, etc. Since these industries are supporting, on the one hand, the waterfront industries, and on the other hand, those that are not essentially on the waterfront, a division between waterfront and inland locations must be expected.

In addition to this division of industries, there has been a decided tendency, particularly in the first group, towards localization. This is most marked in the case of sawmills, concentrated in False Creek or on the north shore of Burrard Inlet. A second example is shipbuilding with the major facilities in North Vancouver. Petroleum refining, localized in the eastern part of the harbour, is still another example.

Through industries may be placed in groups and though some localization may be indicated, the historical growth of the port, type of land, and needs of other activities or the population, will result in a degree of unconformity and mixture in a zone such as the main waterfront of a harbour. The result has been that, though some areas show a concentration of one type of industry, the immediate waterfront of Vancouver has achieved considerable diversity.

In Coal Harbour, where there is protection from wind and where the water is too shallow for large ships, there are moorings and repair facilities for small boats. Farther to the east, where the water of the harbour is deeper, and there is more space for manoeuvering larger ships, are the deep-sea docks and the grain elevators. (Map 5). Interspersed between
docks and elevators are the industries that would be expected in an industrialized waterfront area. One of the largest is a can factory, an industry that falls into the supporting classification; two others, supplying population needs, are a sugar refinery, found exclusively in ports in Canada, and a large meat packing plant. The remainder of the port area from Coal Harbour to Second Narrows has fish canneries, small boat building yards, ice and cold storage plants, tug and scow moorings, scattered almost indiscriminantly among large deep-sea docks, elevators and major industrial developments.

The two industrial areas -- False Creek and the Burrard Inlet waterfront -- have grown up on a basis of local factors, in response to the demands of increased shipping, and growing population. The local factors of site, communications, industrial power, and labour, have permitted increasing industrialization which has drawn population and in turn resulted in a successful growth of trade and commerce. At the same time industrial growth has both depended on, and also permitted, a proper use of the advantages presented by the various hinterlands of the port. This cause and effect relationship between local factors, industrial growth and proper use of hinterlands is a further example of a symbiotic development in which, again, no chronological order need be devised. The dominant conclusion is that the port only prospers and grows as its hinterlands are developed.
CHAPTER FOUR
HINTERLANDS

Definition and Description of Vancouver's Hinterland

A hinterland is that portion of space that is served by a port or whose people and industry use a port for entry and exit. By this definition the coastal hinterland of Vancouver could be said to extend from the International Boundary on the south to the Alaska Panhandle on the north, and include the Queen Charlotte Islands plus both the immediate coastal waters of the province and certain nearby deep-sea areas.

On the south and north this hinterland is limited by political boundaries. To the west its ocean limits vary with the yearly movements of fish to sea or towards the land. The boundary on the east varies as new settlements appear as a result of either renewed mining activity or new logging methods that change previously unused forests to accessible economic lumbering areas.

Other areas of British Columbia use Vancouver as a port of entry and exit. To determine the hinterland of a port and to map its boundaries however, there should be some statistical basis. For the area here defined as Vancouver's coastal hinterland some statistics of tonnages passing through the port are available though they are far from complete for the purpose. For other parts of the province sufficient information is not available, either because no agency has collected it or, as happens more commonly, the private firms involved in trans-
portation, will not make the information available.

In the case of some specific commodities such as concentrates and fruit, information published by the Port of New Westminster Commission, show that port as the main exporter. As these products come largely from Trail and the Okanagan Valley, the available information would indicate that these two areas lie more within the hinterland of New Westminster than of Vancouver. In the case of the reciprocal relationship — the supply from a port to these areas — there is no available information to show that Vancouver is the principal supplier, nor can it be safely assumed that New Westminster fills the role entirely.

Because of the lack of necessary information and the danger of making a false assumption concerning Vancouver's relationship with other areas of British Columbia, no attempt has been made to determine the interior hinterland. Instead, the discussion of the Port of Vancouver in relation to hinterlands has been limited to the coastal area of the province as some statistical information is available to show the reliance of this area on Vancouver for supplies and equipment. This too is substantiated by information supplied by the business firms, industry and shipping companies contacted in Vancouver.

**Principal Exports from British Columbia Ports**

Within the coastal hinterland of the Port of Vancouver, there are a variety of natural resources, or products resulting from them, that are exported to world markets from British
Columbia ports. The most important of these resources or by-products can be divided into the following six groups:

Group 1. Logs, posts, poles, hog fuel, lumber, plywood.
Group 2. Paper and paper stock, wood pulp, pulpwood and chips.
Group 3. Copper ores and concentrates, other ores and concentrates.
Group 5. Fish (fresh, cured, canned, frozen.)

The importance of these groups as export commodities is shown in Figure 7, which deals with the six groups combined, as a percentage of total foreign exports from all the ports of the province. During the period 1943-1949, the amount of foreign exports made up of these commodities fell below 50% of total foreign exports by sea only in 1945, 1946, and 1949. If wheat exports are added, the amount increases to over 70% of total foreign exports in 1945, and over 80% for the remaining years of the period. Thus only between 20% and 30% of the total foreign exports from all British Columbia ports consist of commodities other than those in the six main groups.

By no means do all these resources or products pass through the Port of Vancouver. Nevertheless, it is almost impossible to eliminate the activity and the influence of the port from the functions of the coastal producing areas.

These groups list together the more or less similar commodities resulting from natural resources that comprise the greatest part of the total exports from British Columbia ports (less wheat) as listed in the Annual Shipping Report of the Dominion Bureau Statistics.
Within the coastal hinterland of Vancouver, there are several smaller ports, each with some proportion of foreign exports, that compete with Vancouver. Two of these ports, New Westminster and Victoria, export overseas a number of commodities and operate as the most serious competition to Vancouver. Both Victoria and New Westminster have a diversity of industries which draw on the same natural resources as does Vancouver's industry. Other, but smaller ports export two commodities. In the case of Port Alberni these groups of commodities -- logs, lumber, etc., and pulp, paper, pulpwood, etc. -- are produced from the same natural product. In other cases, however, export commodities result from entirely different resources such as lumber and coal from Nanaimo, pulp, paper, pulpwood and limestone and plaster from Powell River. Still other ports export only one commodity group. Examples of this are: Chemainus, exporting logs, posts, poles, lumber, etc.; Ocean Falls, exporting pulp, paper, wood pulp and pulpwood; Britannia Beach exporting copper ores and concentrates; Union Bay exporting coal; and Prince Rupert exporting fish.

The following charts, Figures 2-7, show in percentages of the total British Columbia foreign export, the amount of each group, exported from each port. From these illustrations it can be seen that Vancouver, with a few exceptions, handles a smaller percentage of the total foreign exports than might be expected. Only in the case of Group 1 do the figures indicate a continual growth between 1943 and 1949, while other
categories show a fluctuation characterized by a gradual lessening in importance. There are exceptions, however. Most notable is the case of coal exports in 1948, the very great increase being due entirely to a large shipment to Japan. Since 1944 coal has not been a major foreign export from Vancouver, this one exception serving to prove Vancouver's adaptability and ability to deal with various commodities when necessary. The other exception appears with Group 5 -- fresh, frozen, cured and canned fish. While this group has not equalled 2% of the foreign exports from all ports (see Fig. 6), by far the greatest percentage is exported from Vancouver. 25

Figures 2 to 7 show that with a few exceptions, at least some proportion of the exports of the province that result from natural resources do find their way to Vancouver. The fact that the other ports export directly as much as they do, indicates that, for the greater part of the coastal area, the Port of Vancouver faces severe competition in the export trade.

25 Calculations for Figs. 2-7 are based on the Dominion Bureau of Statistics Annual Shipping Report, which is the only source of export figures for each port. According to National Harbours Board Annual Reports, fish exports are greater from Vancouver than the Shipping Reports show. The National Harbours Board figures are not used because there is no basis of comparison with other British Columbia ports.

Fish Exports - Vancouver 1943-1949

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<th>1945</th>
<th>1946</th>
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<td>4,630</td>
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<td>72,162</td>
<td>71,465</td>
<td>38,170</td>
<td>29,478</td>
</tr>
</tbody>
</table>

* Fresh, cured, canned and frozen fish.
*Canned, preserved, fresh, frozen, dried, pickled, salted and smoked fish.
GROUP I.
LOGS, POSTS, POLES, ETC.
HOG FUEL.
LUMBER.
PLYWOOD.

PERCENTAGE OF FOREIGN EXPORTS OF GROUP I FROM BRITISH COLUMBIA PORTS FOR THE PERIOD 1943-1949.

Vancouver  Port Alberni  New Westminster  Chemainus  Nanaimo
Victoria  Other

FIGURE 2.

PERCENTAGE OF TOTAL FOREIGN EXPORTS OF GROUP I FROM BRITISH COLUMBIA PORTS.
GROUP 2.
PAPER & PAPER STOCK.
WOOD PULP.
PULP WOOD & CHIPS.

PERCENTAGE OF FOREIGN EXPORTS
OF GROUP 2
FROM BRITISH COLUMBIA PORTS
FOR THE PERIOD 1943-1949

- Vancouver
- Port Alberni
- New Westminster
- Ocean Falls
- Powell River
- Quatsino
- Other

FIGURE 3.

PERCENTAGE OF TOTAL FOREIGN
EXPORTS OF GROUP 2
FROM BRITISH COLUMBIA PORTS
GROUP 3.
COPPER ORES & CONCENTRATES.
OTHER ORES.
OTHER MINE PRODUCE.

PERCENTAGE OF FOREIGN EXPORTS
OF GROUP 3
FROM BRITISH COLUMBIA PORTS
FOR THE PERIOD 1943-1949.

Vancouver
New Westminster
Blubber Bay
Britannia Beach
Stewart

PERCENTAGE OF TOTAL FOREIGN
EXPORTS OF GROUP 3
FROM BRITISH COLUMBIA PORTS.
FIGURE 5.

PERCENTAGE OF TOTAL FOREIGN EXPORTS OF GROUP 4 FROM BRITISH COLUMBIA PORTS

GROUP 4.
COAL

PERCENTAGE OF FOREIGN EXPORTS OF GROUP 4 FROM BRITISH COLUMBIA PORTS FOR THE PERIOD 1943-1949.

Vancouver
Nanaimo
Union Bay
Victoria
PERCENTAGE OF FOREIGN EXPORTS OF GROUP 5 FROM BRITISH COLUMBIA PORTS FOR THE PERIOD 1943-1949.

- Vancouver
- New Westminster
- Victoria
- Prince Rupert
- Other

PERCENTAGE OF TOTAL FOREIGN EXPORTS OF GROUP 5 FROM BRITISH COLUMBIA PORTS.
GROUP 6.
LIME.
LIMESTONE.
PLASTER.


- Vancouver
- Blubber Bay
- Powell River
- Other

FIGURE 7.

PERCENTAGE OF TOTAL FOREIGN EXPORTS OF GROUP 6 FROM BRITISH COLUMBIA PORTS.
Such quantities of the different groups that do get to Vancouver can be accounted for by several factors. Lumber, logs, posts, etc., are shipped to Vancouver, primarily because of the great industrialization of the port. Increased industrialization has resulted in a diversity of manufactured goods which, combined with lumber, attracts deep sea shipping; because deep-sea shipping is attracted, other products for world markets such as pulp, paper, pulpwood and wood pulp are also drawn to the port. The same situation applies in the case of fish and copper ores and concentrates, which can be moved to the port by coastal shipping for world export.

Two reasons then for Vancouver being able to compete in the export trade are historical and economic in background. A third reason can be found in the fact that the Port of Vancouver is easily accessible, large and efficiently operated -- all being great attractions to world shipping.

Even with the competition from so many smaller ports, there are certain areas that are considered by the industrialists, operators, business and shipping men concerned, as contributary essentially to Vancouver. There are two such areas, overlapping to a certain degree.

Lumber Hinterland

The first is the area that supplies forest products to Vancouver sawmills. This lumber hinterland consists of the coastal area on either side of the waterway separating Vancouver Island from the mainland of British Columbia as far north as
Allison Harbour, (Map 6) plus the Queen Charlotte Islands.

In general the eastern boundary in the mountains of the mainland is at an elevation of 4,500 feet. This limit exists not so much as a result of tree size, but rather as the maximum elevation at which present-day equipment can be used economically over the rough mountainous terrain. The maximum limit has been increased to its present general elevation during the post-war years through a change, by several companies, from railway equipment to trucks for moving logs to tide-water.

From the lower, more accessible slopes in the southern part of the area, up to a maximum of 4,000 feet, Douglas fir (Pseudotsuga taxifolia) is the principal species used. At higher elevations, with an annual precipitation of over 60 inches, there appears a mixed growth of western red cedar (Thuja plicata), hemlock (Tsuga heterophylla) and spruce (Picea sitchensis). In the northern part of the area increased northern latitude has the effect of reducing the elevation at which these species are found, and here hemlock is the most common commercial type. In the Queen Charlotte Islands high grade spruce is virtually the only species used.

Over the entire area supplying forest resources to Vancouver the influence is felt of the mills at New Westminster and on the North Arm of the Fraser River. The stretch of the

---

Fraser River extending from New Westminster to Marpole on the southern edge of Vancouver, is a single industrial zone, predominantly of forest products factories. Not only do the mills there draw from the same hinterland as Vancouver, but it is difficult to determine any division of log movements between the two areas.

A controlling influence over logging operations in the lumber hinterland of Vancouver is climate. Coastal British Columbia has a Marine West Coast type of climate, characterized by summer minimum and winter maximum rainfall, and the passage of mid-latitude depressions during the winter months. One result of the rainfall regime is that the forests on the slopes of the Coast Mountains and on Vancouver Island often become very dry during summer, necessitating a temporary shutdown of lumber camps to avoid forest fires. In winter, with winter maximum precipitation, the woods again are often closed temporarily because of excessive snow. Finally, as a result of thaws and rain, floods often damage or destroy roads and rail lines used in the lumbering areas.

A further difficulty resulting from the climatic type of the area is storms. Winter storms can be a great danger to slow-moving tugs towing large rafts of logs from coastal centres to Vancouver. Much serious damage is avoided however, because of the many long inlets, islands and bays of the coast, which afford excellent temporary shelter.
The Fish Hinterland

The Pacific Coast fisheries of British Columbia are the second area supplying resources to industry in the Port of Vancouver and, with the adjacent shore areas used for installation, form the fish hinterland of the port. In the case of this hinterland too, there is a division into two main areas. The first is one of open sea extending from the northern tip of Vancouver Island to the Queen Charlotte Islands and, in some cases, to the Aleutian Islands. In this area halibut are caught under mutual agreements with the United States. Tuna, the second major species obtained from this area, are caught up to 200 miles offshore.

Inshore waters comprise the second main area. They extend from the International Boundary in the south, northward to Cape Scott on Vancouver Island, and include the enclosed waters to the east and the immediate coastal waters to the west of Vancouver Island (Map 6). From this second area come the very great quantities of fish — chiefly herring, cod, pilchards, shell fish, and several varieties of salmon — which make British Columbia a major fish producing province of Canada.

Though both these areas are contributary to Vancouver, there are numerous zones of competition. In the northern area particularly, Prince Rupert creates some rivalry. To this must be added the losses to American boats, even though fishing is

---

carried on under mutual agreements. In both areas, further competition is created by the number of fish canneries and processing plants at small coastal settlements to the north of Vancouver (Map 6) and at Victoria, New Westminster, and Steveston in the immediate vicinity of Vancouver.

Though only fifteen of the seventy fish curing and packing plants of the province are in Vancouver the port nevertheless profits very greatly from fishing activity. Not only is Vancouver the home port for much of the fishing fleet during the off-season, but it also serves as a major supply and communication centre during the fishing season and the export centre for the finished products.

Minerals — Copper, Ores and Concentrates

Figure 4 shows a steady decline of ores and concentrates, as an export commodity, from all British Columbia ports. Even with this steady decrease in importance, two other ports, New Westminster and Britannia Beach show an ever increasing superiority over Vancouver. New Westminster owes its importance to the close relationship between the Pacific Coast Terminals, the principal docks in the port, and the Consolidated Mining and Smelting Company of Trail, the largest producer of ores and concentrates in the province. The increase in export from Britannia Beach results from the growing tendency of all the small ports to export directly rather than through Vancouver.

(See Chapter Five). While Trail, exporting through New Westminster, is not within the hinterland of Vancouver, Britannia Beach, despite the direct shipping to foreign markets, is within the hinterland of the port. The reasons are, first, that such ores and concentrates that the Port of Vancouver does export, come from Britannia Beach. Secondly, Britannia Beach is almost entirely dependent on Vancouver for supplies and equipment.

**Wheat**

The third, and most important export commodity passing through Vancouver is wheat. The wheat shipped through British Columbia ports is almost exclusively from Alberta, and as there exist virtually no significant reciprocal trade relationships between Vancouver and Alberta it is hardly correct to call Alberta a true hinterland of the Port of Vancouver. Instead, this is an example of a situation typical of several Canadian ports that serve all or a part of Canada more than a limited, near-by, hinterland.

Wheat exports increased from 8.5% to 36.4% of the total exports made up of Groups 1 to 6 plus wheat (Fig. 3) from British Columbia between 1943 and 1949; for the same period, the amount shipped through Vancouver averaged 91.5% of the wheat exported from all ports of the province (see Fig. 9). Thus it can be seen that wheat, in itself, is an important export commodity. Still further, however, it must be recognized

29 Smith, F. Chairman, Board of Grain Commissioners, Vancouver, interview with the writer, July 18, 1950.
FIGURE 8.
PERCENTAGE OF FOREIGN EXPORTS FROM ALL BRITISH COLUMBIA PORTS 1943-1949 MADE UP OF GROUPS 1-6.

- Foreign exports of Groups 1-6.
- --- Foreign exports of Groups 1-6 plus Wheat.
PERCENTAGE OF FOREIGN EXPORTS OF WHEAT FROM BRITISH COLUMBIA PORTS FOR THE PERIOD 1943-1949.

- Vancouver
- New Westminster
- Victoria

FIGURE 9

PERCENTAGE OF TOTAL FOREIGN EXPORTS OF WHEAT FROM BRITISH COLUMBIA PORTS
as one of the great attractions of the Port of Vancouver. Other commodities, such as wood products, pulp and paper, fish and minerals, are available to deep-sea shipping for distribution to world markets. To a certain degree however, the Port of Vancouver is remote from world market areas. Particularly is this true in the light of the economic and political insecurity of much of southern and eastern Asia, which, with its great population, is one of the closest and generally most easily accessible overseas markets for Vancouver. To serve suitable market areas then, Vancouver's exports must move to Europe either across the Pacific Ocean and via the Suez Canal, or via the somewhat shorter, but still lengthy route of the Panama Canal and Atlantic Ocean to Eastern American or European markets. Both of these are voyages of too great a length for a large volume of ships, loaded with cargoes of British Columbia product only.

An additional factor to be considered is the competition offered by the Port of Montreal. One of its greatest advantages over Vancouver in relation to European markets is distance, Montreal being 2,700 miles from Liverpool while the distance from Vancouver to Liverpool via the Panama Canal, is 8,600 miles. This is partially compensated for by rail freight rates on Alberta wheat which averages 1.8% per bushel less through Vancouver than through Montreal.²⁰ A further advantage of Vancouver over Montreal is that Vancouver is an all-year port.

²⁰ Millner, R.W., Transport Controller, Department of Transport, Ottawa, interview with the writer, July 7, 1952.
and western wheat can be exported after the close of navigation on the St. Lawrence River.

Considering the quantities exported, lumber and lumber products alone, might be considered a sufficient attraction. There always exists however, the possibility of a ship having to make several calls at different coastal ports to complete a cargo exclusively of lumber. With very large quantities of wheat available in Vancouver, the necessity of side trips is largely removed; a hold cargo of wheat can be loaded at the same time that a deck cargo of lumber is taken on board, and if further variety is desired, a cargo can be completed with other commodities -- paper, fish, minerals, etc. -- that have moved to the port from coastal production centres. Thus it is that wheat, a product from outside the province, has achieved a top rank among export commodities, at the same time serving as a major attraction to the port.

The Reciprocal Relation Between Port and Coastal Hinterland

Another aspect of the relationship between port and hinterland appears with an examination of the reciprocal relationship between the two. 31

31 Unfortunately no Government authority or private agency compiles statistics to show the commodities, and quantities of each, moved by coastal shipping. To determine the principal goods shipped from Vancouver to coastal ports, it is necessary to compare the Annual Reports of the National Harbours Board with the Annual Shipping Reports of the Dominion Bureau of Statistics. The first report gives total tonnages of a number of commodities exported from Vancouver both foreign and coastal; the second report lists the commodities and their quantities for foreign export. As there is never any agreement on total tonnages of cargoes or shipping in these two reports, coastal tonnages cannot be determined. All that can be shown by a comparison of these reports are the commodities that move from Vancouver to coastal points.
The most important feature is the position Vancouver holds, as a coastal port, in relation to the other ports of the coast. The only available figures to show this are Registered Net Tonnages in Coastal Service at the various ports, which are here shown (Table 5) as percentages of the annual total for all ports.

### TABLE 5 - Percentages of Net Reg. Tons Coastal Shipping, Arrivals.

<table>
<thead>
<tr>
<th></th>
<th>1949</th>
<th>1948</th>
<th>1947</th>
<th>1946</th>
<th>1945</th>
<th>1944</th>
<th>1943</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancouver</td>
<td>43.2%</td>
<td>42.8%</td>
<td>41.4%</td>
<td>41.9%</td>
<td>41.2%</td>
<td>41.8%</td>
<td>41.4%</td>
</tr>
<tr>
<td>Victoria</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nanaimo</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Westminster</td>
<td>41.4%</td>
<td>40.1%</td>
<td>39.4%</td>
<td>39.6%</td>
<td>39.3%</td>
<td>37.4%</td>
<td>38.6%</td>
</tr>
<tr>
<td>Powell River</td>
<td>41.4%</td>
<td>40.1%</td>
<td>39.4%</td>
<td>39.6%</td>
<td>39.3%</td>
<td>37.4%</td>
<td>38.6%</td>
</tr>
<tr>
<td>All Others</td>
<td>15.4%</td>
<td>17.1%</td>
<td>19.2%</td>
<td>18.5%</td>
<td>19.5%</td>
<td>20.8%</td>
<td>20.0%</td>
</tr>
<tr>
<td>TOTAL All Ports in 000's of Tons</td>
<td>22,338</td>
<td>24,025</td>
<td>23,607</td>
<td>19,950</td>
<td>18,775</td>
<td>18,272</td>
<td>17,701</td>
</tr>
</tbody>
</table>

Source: Canada, Dominion Bureau of Statistics, Shipping Reports for the years 1943-1949. Converted to percentages by the writer.

These figures show an increase in total tonnage between 1943 and 1949, as well as a continuously high percentage of the total for Vancouver. Also, they show Vancouver with a higher percentage than the next four ports combined, all of which had annual totals in excess of one million registered net tons.

The annual totals in some cases are made up, in part, by several arrivals in one day, one week, or one month, by the same vessel, particularly at Vancouver, Victoria, and Nanaimo, where coastal ships on scheduled voyages, greatly swell the totals.
Despite this, however, the percentages given show Vancouver in a leading position in coastal shipping.

Vancouver, with its preponderance of coastal shipping, serves as the supply centre for coastal British Columbia. From available lists, it is possible to determine only a few commodities which are known to go to coastal ports. Those shipped regularly each year and in considerable quantities are: petroleum products -- fuel oil, gasoline and kerosene; cement; alcoholic beverages; non-agricultural machinery and parts. Other goods, shipped spasmodically are: salt, sulphur, chemicals, tin and tin manufactures. By far the greatest single commodity group comes under the heading "All goods not otherwise specified", and, with this group an approximate figure can be given for tonnages shipped each year to coastal ports.

TABLE 6 - Approximate Tonnages of Unspecified Cargo Shipped From Port of Vancouver to all Coastal Ports of B.C. 1944-1949

<table>
<thead>
<tr>
<th>Year</th>
<th>Tonnages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1944</td>
<td>423,124</td>
</tr>
<tr>
<td>1945</td>
<td>414,069</td>
</tr>
<tr>
<td>1946</td>
<td>543,095</td>
</tr>
<tr>
<td>1947</td>
<td>611,349</td>
</tr>
<tr>
<td>1948</td>
<td>693,092</td>
</tr>
</tbody>
</table>

This category is made up of all the commodities shipped outward that do not, individually, total 20,000 tons during

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32 These tonnages are calculated by subtracting the Dominion Bureau of Statistics figure for "All other freight, n.o.s." leaved for foreign countries, from the National Harbours Board figure for "All goods not otherwise specified", shipped outward from Vancouver. The figure is an approximation because of the inherent disagreement between the two sources; it is presumed that the difference between "Cargoes loaded for foreign countries" and "Cargo Tonnage Outward" is cargo in coastal movement.
the year, in contrast to such items as petroleum products,
machinery, etc., previously mentioned, that consistently reach
totals of over 20,000 tons annually. The items in the "n.o.s."
list are numerous, and include such commodities as steel, fruit,
sugar, lathing, asphalt, brick, chinaware, coffee, wire goods,
to mention but a few. Many of these are commodities shipped
from rail-head at Vancouver, to the commercial centres at
Victoria and Nanaimo. Many others, however, are the needs of
the isolated industrial settlements of the coastline, that are
inaccessible from the land, and therefore rely entirely on the
Port of Vancouver for their supply.

Regular coastal shipping transports a part of the total
 tonnage. The remainder is moved by specialized types of shipp­
ing, developed exclusively for the movement of one commodity,
such as bulk petroleum products, or developed for the trans­
portation of coastal produce to Vancouver and the return of
necessary supplies to producing areas (see Chapter Five).

World Markets

Another link between the Port of Vancouver and its
coastal hinterland is seen in the export activity of the port
in relation to world markets. From the late war years through
the post-war period to 1949, foreign exports from all British
Columbia ports have shown a large increase paralleled by a
similar increase in foreign exports from Vancouver (see Table 7).

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33 Ottawa Office of National Harbours Board. Interview
by the writer. October 3, 1950.
Though total export tonnages have increased there has been a change from the pre-war markets that received British Columbia exports (see Map 7). Of all the markets established in the period 1921-1934, only that of the United Kingdom still remains of major importance primarily because of the continued export of wheat and lumber. Increased lumber exports to the United States have resulted in that market-area becoming one of importance to Vancouver during the period from 1943 to 1949, while exports to the Far East and Western Europe have declined considerably. Other areas such as Scandinavia and the Baltic, the Mediterranean countries, Central America and the Caribbean area and South America, never have been of great value as export markets.

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports B.C. (Tons)</th>
<th>Exports Vancouver (Tons)</th>
<th>Percentages from Vancouver</th>
<th>Percentages from New Westminster</th>
<th>Percentages from other B.C. Ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1943</td>
<td>1,706,043</td>
<td>553,578</td>
<td>32.4%</td>
<td>24.6%</td>
<td>43 %</td>
</tr>
<tr>
<td>1944</td>
<td>2,323,975</td>
<td>1,145,792</td>
<td>49.3%</td>
<td>13.8%</td>
<td>36.9%</td>
</tr>
<tr>
<td>1945</td>
<td>3,365,394</td>
<td>1,584,710</td>
<td>47.0%</td>
<td>18.0%</td>
<td>35.0%</td>
</tr>
<tr>
<td>1946</td>
<td>4,316,952</td>
<td>2,445,495</td>
<td>56.6%</td>
<td>18.5%</td>
<td>24.9%</td>
</tr>
<tr>
<td>1947</td>
<td>4,881,357</td>
<td>2,244,588</td>
<td>45.9%</td>
<td>24.8%</td>
<td>29.3%</td>
</tr>
<tr>
<td>1948</td>
<td>4,316,986</td>
<td>2,098,015</td>
<td>48.5%</td>
<td>20.1%</td>
<td>31.4%</td>
</tr>
<tr>
<td>1949</td>
<td>5,060,859</td>
<td>2,676,258</td>
<td>52.8%</td>
<td>18.7%</td>
<td>28.5%</td>
</tr>
</tbody>
</table>

Source: Canada, Dominion Bureau of Statistics, Shipping Report for the Years 1943-1949. 1943 - see Table 6. 1944-1949 - see Table 7. Percentages calculated by the writer.
The loss to Canadian exporters of much of the Oriental market, due largely to political upheavals in China has been unfortunate for the Port of Vancouver. With such a great population concentration so easily reached in an area where extensive post-war reconstruction was expected, it was indeed a potentially rich market.

**Passenger Traffic**

The decrease in exports to the Orient is closely linked with the decrease in overseas passenger movements from Vancouver. While the figures in Table 6 indicate that Vancouver never had a large movement of foreign passengers, they do show a considerable decrease between 1936 and 1948, of what little passenger movement there was. This is due largely to the decrease in freight movement to the Orient combined with the loss, during the war, of much of the Canadian Pacific Railway Company's Pacific fleet, or the transfer of the remaining ships to the Atlantic service. For the long trans-Pacific voyage from Vancouver to Yokahama, Shanghai, Hong Kong and Manila, a basis of freight is essential for passenger movement with the degree of luxury supplied by the Canadian Pacific Company until the beginning of the war.

An example of the difficulties faced in overseas passenger traffic is seen with the present position of the R.M.S. "Aorangi" of the Royal Australian Mail Line, the only trans-Pacific passenger ship using the Port of Vancouver. Before the war, this ship, and her sister ship, the "Niagara", lost
during the war, made scheduled runs between Australia, New Zealand and Vancouver. Since the war, even with mail contracts, this one service has fared so badly that plans were made to cancel the service as of January, 1951. This final measure has been avoided, but only by the payment of an annual subsidy jointly by Canada, Australia and New Zealand.

<table>
<thead>
<tr>
<th></th>
<th>Embarked</th>
<th>Foreign % of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1936</td>
<td>Foreign</td>
<td>14,669</td>
</tr>
<tr>
<td></td>
<td>Coastal</td>
<td>467,571</td>
</tr>
<tr>
<td>1940</td>
<td>Foreign</td>
<td>5,746</td>
</tr>
<tr>
<td></td>
<td>Coastal</td>
<td>665,794</td>
</tr>
<tr>
<td>1944</td>
<td>Foreign</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>Coastal</td>
<td>932,328</td>
</tr>
<tr>
<td>1948</td>
<td>Foreign</td>
<td>2,014</td>
</tr>
<tr>
<td></td>
<td>Coastal</td>
<td>574,818</td>
</tr>
</tbody>
</table>

1936 p. 55.  
1940 p. 27. Confidential Report.  
1944 p. 66.  
1948 p. 67.

A factor contributing to the decrease in passenger traffic is the service now supplied by airlines. The Canadian Pacific Airlines have scheduled flights to Japan and Australia, and the British Commonwealth Pacific Airlines have flights to Australia from Vancouver. These services handle all the essential trans-Pacific passenger movement, thus decreasing the need of luxury passenger vessels.

Passenger movement is usually of considerable importance
to a port. Not only does it tend to increase shipping, but, almost invariably there is some freight movement connected with it. Arrivals and departures of large numbers of passengers is also of value to railways, hotels, and the commercial portion of the port's city. As a port cannot be separated from its city, and as profit to one is profit to the other, so all gains from passenger traffic are mutually shared.

Obviously, Vancouver suffers a considerable loss in terms of overseas passenger movements. In the case of coastal passengers, however, quite the opposite situation exists, and indeed, as Table 9 shows, Vancouver can be rated as the greatest passenger port of Canada.

Tables 8 and 9 show both a great increase in coastal passenger traffic and a very high total figure. A considerable proportion of the yearly totals -- a proportion impossible to determine -- consists of tourists in summer and, for the remainder of the year, a steady movement of passengers on the daily trips to Victoria, Nanaimo and Seattle. It can only be assumed, however, that the Port of Vancouver has a large passenger movement to British Columbia coastal ports other than Victoria and Nanaimo. The increased total each year of registered net tonnage to coastal ports shown in Table 5, is one basis on which to assume an increased passenger movement to coastal ports. A second basis on which such an assumption can be made is the fact that of twenty scheduled voyages made by the three main shipping companies, with over 170 ports of call, only two emanate from ports other than Vancouver, and one of
### TABLE 9 - Passenger Movements of Principal Canadian Ports 1944-1948.

#### Foreign Passenger Movements (Arrivals & Departures)

<table>
<thead>
<tr>
<th></th>
<th>Halifax</th>
<th>Saint John</th>
<th>Quebec</th>
<th>Montreal</th>
<th>Vancouver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1948</td>
<td>87,430</td>
<td>2,772</td>
<td>19,037</td>
<td>34,650</td>
<td>4,049</td>
</tr>
<tr>
<td>1947</td>
<td>49,030</td>
<td>1,572</td>
<td>255</td>
<td>18,743</td>
<td>1,119</td>
</tr>
<tr>
<td>1946</td>
<td>83,721</td>
<td>1,246</td>
<td>39</td>
<td>8,717</td>
<td>6,248</td>
</tr>
<tr>
<td>1945</td>
<td>29,353</td>
<td>599</td>
<td>1,721</td>
<td>3,900</td>
<td>811</td>
</tr>
<tr>
<td>1944</td>
<td>12,825</td>
<td>560</td>
<td>--</td>
<td>1,406</td>
<td>281</td>
</tr>
</tbody>
</table>

#### Coastal Passenger Movements (Arrivals & Departures)

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1948</td>
<td>104,415</td>
<td>89,492</td>
<td>152,642</td>
<td>1,727,095</td>
<td></td>
</tr>
<tr>
<td>1947</td>
<td>95,828</td>
<td>70,879</td>
<td>145,181</td>
<td>1,855,295</td>
<td></td>
</tr>
<tr>
<td>1946</td>
<td>112,442</td>
<td>78,367</td>
<td>144,048</td>
<td>1,897,680</td>
<td></td>
</tr>
<tr>
<td>1945</td>
<td>176,542</td>
<td>97,039</td>
<td>148,902</td>
<td>1,941,882</td>
<td></td>
</tr>
<tr>
<td>1944</td>
<td>156,454</td>
<td>75,568</td>
<td>125,514</td>
<td>1,866,167</td>
<td></td>
</tr>
</tbody>
</table>

#### Total Passenger Movements (Arrivals & Departures)

<p>| | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1948</td>
<td>87,430</td>
<td>107,187</td>
<td>108,529</td>
<td>187,292</td>
<td>1,731,144</td>
</tr>
<tr>
<td>1947</td>
<td>49,030</td>
<td>97,400</td>
<td>71,134</td>
<td>163,924</td>
<td>1,856,414</td>
</tr>
<tr>
<td>1946</td>
<td>83,721</td>
<td>113,688</td>
<td>78,406</td>
<td>152,765</td>
<td>1,903,928</td>
</tr>
<tr>
<td>1945</td>
<td>29,353</td>
<td>177,141</td>
<td>98,760</td>
<td>152,802</td>
<td>1,942,693</td>
</tr>
<tr>
<td>1944</td>
<td>12,825</td>
<td>157,014</td>
<td>75,568</td>
<td>126,560</td>
<td>1,866,448</td>
</tr>
</tbody>
</table>

there is a car ferry operated only during the summer months.\textsuperscript{34}

Not only does Vancouver appear to be the distribution centre for equipment and supplies to the hinterland, but also the port of origin for the movement of passengers to the same area. Several ships that sail from Vancouver are combination freight and passenger vessels so there is a degree of overlapping in the two activities which serves still further to link together the Port of Vancouver and its hinterland.

CHAPTER FIVE
THE PORT OF VANCOUVER IN RELATION TO HINTERLANDS AND THE PORT SYSTEM

The Spread of Vancouver's Influence

In the early days of settlement in British Columbia the only ports in operation were those of the southern coastal area — New Westminster, Victoria, Nanaimo and Vancouver. For any productive activity further afield, these ports were sufficient: New Westminster as the port of entry and supply centre for the gold fields of the interior after 1863; Vancouver and Victoria as the centres of operation in Canada for much of the movement to the Yukon gold fields after 1898.

With the turn of the century, however, lumbering which had first started in 1862, began to spread outward from Vancouver and New Westminster. With operations conducted farther from the mills, more and more settlements began to appear in isolated places on the coast. Prospecting and fishing, expanding outward with lumbering, added extra demands to a growing coastal shipping which had its origin and early growth as the response to demands from coastal settlements. In many cases coastal shipping firms gambled on the future growth of a settlement and did all they possibly could to move in supplies, equipment and passengers to isolated settlements, often miles from their regular sailing routes.35 In cases where industrial development such as logging, mining, or fish

35 Mr. G.M. McBean, General Manager, Union S.S. Vancouver, B.C., interview with the writer, July 26, 1950.
processing proved successful, there followed profit to coastal shippers not only by continuing to deliver necessary freight, but also in moving out to a larger port for world export, the materials produced.

As the larger ports of the southern part of the coast began receiving increasing quantities of coastal products, particularly wood products, so too the grain export trade of Vancouver was growing. With the rapid growth of grain storage and loading facilities after 1923, increasing numbers of ships were attracted to the port (see Table 2) where mixed cargoes consisting predominantly of grain and lumber products were readily available.

With increased coastal shipping moving more raw materials, particularly lumber, to Vancouver, industrial space in the city and on its waterfront became scarce. The solution was to establish large industries at coastal settlements, much nearer the raw materials. Thus industries grew up at such places as Powell River, Ocean Falls, Port Alberni and Chemainus.

The final step in the development of the British Columbia coast has given rise to an efficient combination of industry and shipping. With world shipping attracted to the British Columbia coast by the grain trade and with commodities for world markets available at several coastal points, a few far-seeing men visualized the advantage of direct movement from coastal points by deep-sea freighters, rather than trans-shipment by coastal shipping to Vancouver and then to the ships.
This was not merely a simple matter of advertising certain cargoes as available at various small ports, but rather a long and involved campaign against established shipping custom of using recognized deep-sea ports only. The final result was a growth in the overseas export trade from such coastal points as Powell River and Ocean Falls in particular, two of the first ports on the coast where new industry and deep-sea shipping were combined.

This new arrangement did not mean a very great loss in the total ship movement through Vancouver. The grain trade continued to be of major importance; the wood processing industries grew in number and in turn made greater demands on coastal supply areas for raw materials; greater production at coastal settlements in turn increased the need for supplies, equipment, and labour, all supplied through the Port of Vancouver.

Therefore, even with increasing annual totals of export tonnage going directly from centres other than Vancouver, the port maintained and even strengthened its importance as the major supply and export centre for the entire coastal area.

Types of Shipping

Because of the difficulties of moving forest resources -- the principal raw material moved on the British Columbia coast -- the use of specialized shipping methods has grown up.

36 M.H. Dalton, Manager, B.C. Division, Canadian Manufacturers Association and Mr. A.E. McMaster, Port Manager, National Harbours Board, Vancouver, interviews with the writer October 7 and October 14, 1949.
<table>
<thead>
<tr>
<th>Province</th>
<th>STEAM</th>
<th></th>
<th>MOTOR</th>
<th></th>
<th>UNRIGGED</th>
<th></th>
<th>TOTAL</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nova Scotia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal</td>
<td>7,193</td>
<td>3,631,484</td>
<td>---</td>
<td>---</td>
<td>101</td>
<td>17,023</td>
<td>7,294</td>
<td>3,648,507</td>
</tr>
<tr>
<td>Foreign</td>
<td>495</td>
<td>2,071,745</td>
<td>431</td>
<td>445,217</td>
<td>---</td>
<td>---</td>
<td>926</td>
<td>2,516,962</td>
</tr>
<tr>
<td>TOTAL</td>
<td>7,688</td>
<td>5,703,229</td>
<td>431</td>
<td>445,217</td>
<td>101</td>
<td>17,023</td>
<td>8,220</td>
<td>6,165,469</td>
</tr>
<tr>
<td>Quebec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal</td>
<td>10,591</td>
<td>9,774,530</td>
<td>---</td>
<td>---</td>
<td>484</td>
<td>125,567</td>
<td>11,075</td>
<td>9,900,097</td>
</tr>
<tr>
<td>Foreign</td>
<td>1,325</td>
<td>4,393,668</td>
<td>386</td>
<td>887,981</td>
<td>---</td>
<td>---</td>
<td>1,711</td>
<td>5,281,649</td>
</tr>
<tr>
<td>TOTAL</td>
<td>11,916</td>
<td>14,168,198</td>
<td>386</td>
<td>887,981</td>
<td>484</td>
<td>125,567</td>
<td>12,786</td>
<td>15,181,746</td>
</tr>
<tr>
<td>British Col.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal</td>
<td>31,551</td>
<td>17,785,232</td>
<td>---</td>
<td>---</td>
<td>11,568</td>
<td>4,553,341</td>
<td>43,119</td>
<td>22,338,573</td>
</tr>
<tr>
<td>Foreign</td>
<td>926</td>
<td>3,051,402</td>
<td>1,275</td>
<td>2,259,808</td>
<td>164</td>
<td>36,417</td>
<td>2,365</td>
<td>5,347,627</td>
</tr>
<tr>
<td>TOTAL</td>
<td>32,477</td>
<td>20,836,634</td>
<td>1,275</td>
<td>2,259,808</td>
<td>11,732</td>
<td>4,589,758</td>
<td>45,484</td>
<td>27,686,200</td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coastal</td>
<td>69,402</td>
<td>50,537,727</td>
<td>---</td>
<td>---</td>
<td>12,586</td>
<td>5,498,025</td>
<td>81,988</td>
<td>56,035,752</td>
</tr>
<tr>
<td>Foreign</td>
<td>6,405</td>
<td>19,983,528</td>
<td>2,877</td>
<td>4,333,058</td>
<td>301</td>
<td>143,048</td>
<td>9,583</td>
<td>24,459,634</td>
</tr>
<tr>
<td>TOTAL</td>
<td>75,807</td>
<td>70,521,255</td>
<td>2,877</td>
<td>4,333,058</td>
<td>12,887</td>
<td>5,641,073</td>
<td>91,571</td>
<td>80,495,386</td>
</tr>
</tbody>
</table>

Source: Canada, Dominion Bureau of Statistics, Shipping Report 1949, Table 4, pp. 22-23.
TABLE 11 - Tugs Entered in Coastal and Foreign Services, 1949.

<table>
<thead>
<tr>
<th>Province</th>
<th>COASTAL</th>
<th>FOREIGN</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newfoundland</td>
<td>37</td>
<td>11,982</td>
<td>3</td>
</tr>
<tr>
<td>Prince Edward Is.</td>
<td>15</td>
<td>1,963</td>
<td>15</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>248</td>
<td>41,027</td>
<td>51</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>74</td>
<td>9,688</td>
<td>22</td>
</tr>
<tr>
<td>Quebec</td>
<td>484</td>
<td>67,980</td>
<td>3</td>
</tr>
<tr>
<td>Ontario</td>
<td>408</td>
<td>81,091</td>
<td>340</td>
</tr>
<tr>
<td>British Columbia</td>
<td>13,370</td>
<td>1,575,495</td>
<td>1,068</td>
</tr>
<tr>
<td>Vancouver</td>
<td>7,551</td>
<td>840,728</td>
<td>292</td>
</tr>
<tr>
<td>Nanaimo</td>
<td>1,309</td>
<td>121,567</td>
<td>140</td>
</tr>
<tr>
<td>Victoria</td>
<td>1,258</td>
<td>181,692</td>
<td>129</td>
</tr>
<tr>
<td>New Westminster</td>
<td>1,146</td>
<td>171,881</td>
<td>139</td>
</tr>
<tr>
<td>CANADA TOTAL</td>
<td>14,636</td>
<td>1,789,226</td>
<td>1,487</td>
</tr>
</tbody>
</table>

Not only are the methods the response to the demand, but also they are methods that are successful largely because of the many miles of sheltered, enclosed waterways used by coastal shipping. The basis for the movement of the greatest part of the coastal resources is tug traffic, with tugs used for the towing of rafts or booms of logs, barges and scows.

Shipping of this type, classed as "unrigged" is one of the major shipping activities in British Columbia. Unfortunately the lack of statistics showing cargo tonnages does not permit a clear demonstration of this aspect of shipping. Tables 10 and 11, however, give an indication of the importance of "unrigged", or tug traffic throughout the British Columbia coast.

Tug traffic has two subdivisions: the movement of "unrigged" vessels, consisting of barges and scows; and log towing.

Because of the nature of the waterways used, logs cut in the coastal forests of British Columbia can be moved to any port on the coast by tugs. Navigable routes, protected from storms and wind are necessary because of the slow speeds (average speed is two knots) and therefore the vulnerability of log rafts.\(^{37}\) If long voyages are made over unsheltered routes a Davis Raft is used. This, and other rafts similar to it, consists essentially of a large cradle of logs joined by

\(^{37}\) There is a very high percentage of recovery of logs from rafts broken by storms. Licensed beachcombing, administered from Vancouver and supported jointly by several logging companies, has done much to eliminate loss by storms or rough seas.
cables and chains, filled with loose logs, and fastened firmly with additional binding cables. These rafts project as much as twenty feet underwater and contain up to 1,000,000 feet of lumber. In sheltered areas, a flat raft or booms of logs, loosely held together by an outside framework of joined logs, is usually used. These booms may measure up to 50 or 60 sections in length, each section being 60 feet long and containing 40,000 feet of lumber.

The second subdivision of tug traffic is the unrigged type consisting of barges and scows. Again, the protective nature of the coastal waterways and the types of commodities moved have permitted the development of a distinctive type of shipping.

Some of the vessels used are barges, or converted ships, usually old sailing ships with all exterior and interior fittings removed. Thus, just the hull is left for the hauling of bulk cargoes such as sawdust or wood chips. There are some disadvantages to the barges, most notably the depth of water needed and a higher centre of gravity than the much lower scow.

Scows, which are the much more common of the unrigged vessels, are made in a variety of sizes and types. The most commonly used sizes are listed in Table 12. The majority of the scows are open and are used for moving coal, sand and gravel, lumber, and other cargoes that will not be damaged by exposure. For perishable cargoes such as newsprint, cement, and general supplies, covered scows are used.
### TABLE 12 - Sizes and Capacities of Scows.

<table>
<thead>
<tr>
<th>Size</th>
<th>Capacity</th>
<th>Average Building Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>30' x 90'</td>
<td>375 tons</td>
<td></td>
</tr>
<tr>
<td>32' x 90'</td>
<td>450 tons</td>
<td>$19,000.00 (wood)</td>
</tr>
<tr>
<td>34' x 90'</td>
<td>500 tons</td>
<td>$35,000.00 (steel)</td>
</tr>
<tr>
<td>36' x 100'</td>
<td>600 tons</td>
<td>$22,000.00 (wood)</td>
</tr>
</tbody>
</table>


Photo 10. Open type scow, Vancouver.

Photo 11. Covered newsprint scow, Vancouver.
Many of the scows, moved by tugs, travel on regular schedules between Vancouver and coastal industrial centres, moving products from mills to Vancouver, returning with supplies, machinery and equipment. Others carry general cargo between Vancouver and points on Vancouver Island, while still others move lumber from sawmills to ships loading at docks.

A specialized type of scow, (in this instance called a barge) is used by the two railway companies to move freight cars from the mainland to ports on Vancouver Island. Each company operates three barges, capable of carrying fifteen loaded freight cars, and making the journey from Vancouver and return in twenty-four hours.

Photo. 12. Railway barge, Vancouver.

A second specialized type is used by the petroleum industry, an industry that has given rise to many distinctive forms of transportation. In British Columbia, specially-built tank scows capable of holding between 1,000 and 5,000 barrels of petroleum are used to supply the settlements of the southern coast from the refineries located on Burrard Inlet. For
the northern portion of the coast, petroleum supplies are delivered to distribution points from the Vancouver refineries by small coastal tankers with capacities of up to 1,500 tons, (about 12,000 barrels).

A second specialized form of shipping has developed with the coastal fisheries, another of the great natural resources of British Columbia.

Because of the nature of their work, it is almost impossible to determine the number of fishing boats to be found regularly based on a specific harbour. A boat may be registered in one port but use one of many others for unloading fish, loading supplies and equipment, or for shelter during the closed season. Others may rarely use a port during the fishing season, instead delivering freshly caught-fish to fish packers -- which in turn deliver to canneries on the coast or in the ports.

Despite the frequency of use of other than their port of registration, Vancouver is an important centre for the fishing
fleet. Table 13 compares the three main southern ports to Prince Rupert, which has a large number of foreign vessels because of its proximity to American waters, and St. John's, Newfoundland, which has the highest figure for the Atlantic coast.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Tons</td>
<td>Number</td>
</tr>
<tr>
<td>Vancouver</td>
<td>718</td>
<td>28,188</td>
<td>138</td>
</tr>
<tr>
<td>Victoria</td>
<td>398</td>
<td>5,051</td>
<td>242</td>
</tr>
<tr>
<td>New Westminster</td>
<td>127</td>
<td>6,826</td>
<td>12</td>
</tr>
<tr>
<td>Prince Rupert</td>
<td>398</td>
<td>13,521</td>
<td>966</td>
</tr>
<tr>
<td>St. John's</td>
<td>28</td>
<td>1,440</td>
<td>385</td>
</tr>
</tbody>
</table>


Besides the fish packers, mentioned above, there are three other important types of fishing vessels. The largest are the seiners, vessels varying between 45 feet and 70 feet, that operate in inshore waters, and are equipped with large seine nets. The two smaller types are the 35 feet to 45 feet salmon trollers, and the gill netters of 25 feet to 40 feet. Both the last two types are primarily salmon fishing boats, and they work close to shore, moving southward down the coast through the season, as the fish head for the Fraser River.

By far the greatest number of ships moving through the Port of Vancouver are in coastal service. This service
includes large fish packers, oil tankers, small freighters, plus the larger vessels of 5,000 or 6,000 tons that carry passengers, mail, freight, and automobiles between Vancouver, United States ports on Puget Sound, Vancouver Island and coastal settlements to the north.

Excluding fish packers and oil tankers, which are specialized forms of shipping, there are six shipping companies handling coastal passengers and general cargo, with 3/4 ships of varying sizes and uses. (Table 14). Generally speaking, the ships of less than 1,000 tons are cargo vessels;
over 1,000 tons, they carry passengers, freight, and, in the case of the Canadian National and Canadian Pacific ships, automobiles as well.

The majority of these ships operate on schedules from Vancouver, with regular ports of call. The three largest companies have the following regular services: (Map 8)

I. **Canadian Pacific Railway.** (B.C. Coast Steamship Service)

1. The Triangle Route: Vancouver, Victoria, Seattle.
2. Vancouver - Nanaimo.
3. Vancouver - Gulf Islands.
5. Victoria and West Coast of Vancouver Island.
7. Steveston - Nanaimo, (car ferry, summer only).

II. **Union Steamship Company of British Columbia.** (Combined with Frank Waterhouse)

1. Vancouver - Prince Rupert - Alice Arm - Stewart.
2. Vancouver - Prince Rupert - Queen Charlotte Islands.
3. Vancouver - Port Hardy - Ocean Falls - Bella Coola.
4. Vancouver - Knight Inlet - Allison Harbour.
5. Vancouver - Westview - Stuart Island.
6. Vancouver - Sechelt - Fender Harbour.
7. Vancouver - West Howe Sound.
8. Vancouver - East Howe Sound.
11. Vancouver - Woodfibre - Britannia Beach - Port Mellon.

III. **Canadian National Steamships.** (Pacific Coast Service)

Vancouver - Westview - Ocean Falls - Prince Rupert - Ketchikan.

This list of ports of call, the dependence of the coast for petroleum and the use made by fishing vessels and unrigged
<table>
<thead>
<tr>
<th>Company</th>
<th>Ships Less Than 1,000 Tons</th>
<th>1,000-2,000</th>
<th>2,000-3,000</th>
<th>3,000-6,000</th>
<th>TOTALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canadian National Steamships</td>
<td>---</td>
<td>---</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>C.P.R. (B.C. Coast Steamship Service)</td>
<td>---</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Union S.S. Co. of British Columbia</td>
<td>4</td>
<td>8</td>
<td>---</td>
<td>---</td>
<td>12</td>
</tr>
<tr>
<td>Frank Waterhouse &amp; Company, Ltd.</td>
<td>2</td>
<td>1</td>
<td>---</td>
<td>---</td>
<td>3</td>
</tr>
<tr>
<td>Gulf Lines Ltd.</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>2</td>
</tr>
<tr>
<td>British Columbia Steamships Ltd.</td>
<td>2</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>2</td>
</tr>
<tr>
<td>Source: Interviews and personal investigation.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

|                    | 10 | 11 | 5  | 8  | 34   |

Source: Interviews and personal investigation.
craft, show how the Port of Vancouver functions as the focal point of all coastal shipping.

**Wireless Communication**

Wireless communication is the last of the major services and facilities that link Vancouver and its port with the coastal settlements to the north.

The most common method used is radio-telephone, and in this type of service, British Columbia was an early, if not the first, major user. In 1921 the British Columbia Forest Service used one of the first radio-telephone networks in the world. Now there are over 1,500 vessels equipped with radio-telephones through the Northwest Telephone Company, the toll service branch of the British Columbia Telephone Company.

<table>
<thead>
<tr>
<th>Type of Vessel</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fishing Boats</td>
<td>642</td>
</tr>
<tr>
<td>Tug Boats</td>
<td>328</td>
</tr>
<tr>
<td>Pleasure Boats (mainly U.S.)</td>
<td>231</td>
</tr>
<tr>
<td>Passenger and Freight Ships</td>
<td>94</td>
</tr>
<tr>
<td>Miscellaneous (Fishery Patrol, B.C.</td>
<td>79</td>
</tr>
<tr>
<td>Forest Service, etc.)</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,574</strong></td>
</tr>
</tbody>
</table>

Source: Abrams, B.F. Northwest Telephone Co., Vancouver.

The most important use of radio-telephone is for work organization. With head offices of shipping firms, manufacturing companies and oil refineries in Vancouver, and with much of their various activities spread over hundreds of miles of
coastline, waste of time, increased cost, and loss of efficiency would result if quick communication was not available. With the telephone, however, company dispatchers in Vancouver make multiple, or "conference" calls to all their ships. Certain times are allotted each company and each in turn, they send out sailing instructions, schedule alterations, changes in pick-up or delivery calls, plus any company business affecting the ships at sea. In addition there are a very large number of "non-conference" calls, between shore stations and all the various kinds of coastal shipping, plus distress signals which average two per week and take priority over all other calls.

The fact that there were approximately 8,000 calls made from Vancouver during the month of July, 1950,\(^\text{38}\) gives an indication of the importance of radio communication on the British Columbia coast. This total is at least four times that of the Port of Seattle and, in comparison to New York Harbour with approximately 5,000 calls each month, is still further evidence of the important role of Vancouver in all coastal activity.

The "Geographical Port" or "Port District".

Although Vancouver with its port is the shipping, industrial, commercial, and economic capital of coastal British Columbia, it cannot be considered alone. Rather, the whole waterfront area of Burrard Peninsula consisting of the Port of Vancouver, the Port of New Westminster, and the North Arm of

\(^{38}\) Abrams, B.F. Northwest Telephone Co., Vancouver, B.C., interview with the writer, August 11, 1950.
the Fraser River, should be grouped together. (Map 9)

This area is a "geographical port" or "port district". The three port areas are served by the same railway companies; the areas are linked by first class highways; one utility company furnishes industrial power to the entire peninsula; and, finally, wood working is the dominant industry over the whole area, particularly on the North Arm of the Fraser River.

In the case of the lumber industry alone, the entire peninsula is a closely knit unit. Raw materials for the mills moving into the port district cannot be divided into groups destined for the Burrard Inlet mills, the False Creek mills or the mills on the Fraser River, so complicated and continuous is the log movement between port areas. Nor is it easy to determine where, in the port district, the finished lumber is produced, that goes to world markets from either Vancouver or New Westminster.

Wheat is a second commodity common to both Vancouver and New Westminster. Though available in much smaller quantities in New Westminster, (800,000 bushels storage capacity) when added to the capacity and facilities in Vancouver it does make a second similarity in two areas of the port district.

A third factor tending to a unification of the Burrard Peninsula, is the similarity of industries, other than lumber. Meat packing, brewing, metal working, machinery manufacturing, the most important, are distributed over the entire peninsula.

with little regard to municipal boundaries, outlet port or living place of industrial workers, who are widespread over the entire peninsula.
CHAPTER SIX

CONCLUSION

The Port of Vancouver fulfills two roles: first, it is an important world deep-sea port; second, it is the leading port for the coastal shipping of British Columbia. In fulfilling either of these roles adequately the port functions as a point of contact between land and sea. It is in a port, if it is to be a successful one, that this contact between land and sea must be supplemented by the natural and man-made facilities for transition between different methods of transportation.

The statistical information that is available has been combined with a study of the works of others plus personal observation to prove that Vancouver is a great port.

Admirable physical features for port installations, most notably the deep, sheltered inlet and the low Burrard Peninsula, have been the basis on which men, in a comparatively short period of time, built a great city and seaport. The commercial and industrial activity of the city, and in turn, its port, are based on extensive natural resources. In the early days of the settlement of the city, these resources were available close at hand, but, with the growth of industry, sources at a greater distance were exploited.

The ruggedness and inaccessible nature of the coastal areas supplying raw materials to Vancouver's industry, created a dependence on the port: thus coastal shipping, at one period in its growth a highly speculative venture, grew steadily in
importance. As its importance and so its scope of activity increased, small ports, capable of accommodating deep-sea freighters, became established. However, these small coastal centres generally supplied only one major commodity such as lumber, or newsprint, and thus were not able to attract deep-sea shipping in large quantities.

The Port of Vancouver with space for many ships, suitable sites for grain elevators and with rail connections to Alberta, became one of the world's great bulk grain shipping ports. Thus, world shipping was attracted to British Columbia, a feat impossible for the smaller ports of the province to accomplish. This resulted in some loss to Vancouver of foreign exports which went directly from the smaller coastal centres. The port, however, because of its industrialization, and its almost monopolistic control over all coastal shipping, still maintained supremacy as the major port of the British Columbia coast. At the same time, because of the dependence of coastal settlements on Vancouver, it became the centre of a port system: the Port of Vancouver exporting wheat and lumber, attracted world shipping to coastal British Columbia; the small ports supplied one commodity, directly to deep-sea freighters; Vancouver served as the supply centre for the small ports.

Vancouver as the centre of the system of ports, was supplemented by the entire Burrard Peninsula, most notably New Westminster and the North Arm of the Fraser River. The entire peninsula functions as a single industrial and shipping
unit, with Vancouver supreme because of its fine harbour, repair facilities, grain elevators, manufacturing industries, and with its control over coastal producing areas through the network of shipping lines and radio communication.

From the low slopes of the Coast Mountains, the immediate coastal areas and the coastal waters of the province, Vancouver draws raw materials and finished goods which, plus Alberta wheat, attract world shipping. The quantity of world shipping and the great number of coastal vessels of all kinds that use the harbour, are proof that the Port of Vancouver fulfills its function as a point of transition between methods of transportation. Also, the quantity of goods passing through the port from the British Columbia coast to world markets, is proof of an efficient use of the producing areas -- the hinterlands. Therefore, the Port of Vancouver functions successfully as a point of transition between the land, in terms of hinterlands, and the sea, in terms of shipping routes, and world markets.
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MAP 7
EXPORT MARKETS OF BRITISH COLUMBIA COASTAL PORTS
PERCENT OF TOTAL EXPORTS FROM PACIFIC COAST PORTS

1943
1949

SCALE 1:9,375,000
MERCATOR PROJECTION