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SOME EFFECTS OF COAL MINING UPON
THE DEVELOPMENT OF THE NANAIMO AREA

A Thesis
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by
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ABSTRACT

Some Effects of Coal-mining on the Development of the Nanaimo area.

The physical environment of the Nanaimo area, in land forms, climate, soils and vegetation, is similar to that of the eastern coastal plain region of Vancouver Island. Two resources have influenced the occupance particularly: coal deposits and location. The distributing economy made possible by location is still developing, but the economy associated with coal-mining has lost its former dominance. The effects which coal-mining, and adaptation to its decline, have had upon the economic life, the cultural landscape and the population can be studied as a phase in a continuing process of interaction between man and his environment.

Physical factors have placed limitations upon the development of local activities. Location, which both fostered and hindered the progress of coal-mining, is becoming an increasingly important asset. Geological conditions proved disadvantageous to the prosperity of mining and limited the span of its productivity. Topography, soil and drainage restricted the scope of agriculture. The volume of local timber reserves confines their exploitation to small-scale operations, but the large reserves in surrounding areas form the basis of the whole regional economy.

Fishing makes its greatest economic contribution indirectly.

Coal-mining expanded slowly from 1852 until the 1880's. The thirty years following 1890 marked the period of greatest employment and productivity, but it was interrupted by recessions due to the competition of other fuels and to labour difficulties. Decline since 1923 has been rapid and steady. The coal resources are now exploited on a continuously declining scale.

Other economic activities have been further influenced by their changing relationships to coal-mining. Because of its early start, agriculture has nearly reached the limits of its areal expansion. Part-time farming, by which land is used less intensively, has also been encouraged by the mining industry.

The depletion of timber reserves is directly attributable to the demands of the coal-mining economy. Certain manufacturing industries developed to serve the mining community, have disappeared, but others have expanded slightly. Only those dependent upon resources located outside the area are likely to develop significantly. The tertiary industries of the coal-mining period formed the nucleus of the present distributing economy. Favoured by location, they have become the mainstay of the area and have possibilities of further expansion.

The features of the cultural landscape which originated during the coal-mining period are still discernible, but are being obscured by those associated with the distributing economy. The present complex pattern of agricultural and forest land utilization has been determined by the distribution of soil classes and the relationships of these industries to coal-mining. Zones of increasingly intensive utilization, centred on Nanaimo, may be developing. Settlements, formerly located near the outcropping seams, are becoming involved in a general tendency toward radial development. Three types of street patterns have been developed in the city and its vicinity. Elsewhere, the compact street patterns of the mining period are becoming more linear. Distinctive miners' homes remain in certain localities.

The growth of population, formerly related to coal-mining, has not yet significantly increased, but population distribution is changing. Movements in accordance with mining developments have ceased, and the distribution is becoming noticeably dense near Nanaimo. Mining has been replaced as the dominant occupation by the tertiary industries. The nationalities in the area still represent those attracted by the mining industry. Attitudes engendered during the mining period still persist and may have varying effects on future progress.

The present economic structure is based upon a primary resource, lumber, which must compete in the world market. Although the productive capacity of the area could be improved, the greatest contribution toward future development would be the maintenance of the regional timber resources.

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CHAPTER I

STATEMENT OF THE PROBLEM

For seventy years coal mining dominated all phases of life in the Nanaimo area. Today, less than thirty years after the industry attained its peak, coal mining has nearly reached extinction. The patterns which were established during the period of greatest mining activity, and the adjustments which have had to be made following the decline of the industry still strongly influence life in the community. In this study, an attempt will be made to analyse and evaluate the effects which coal mining has had upon the development of the area.

The Nanaimo area has been occupied by Europeans for nearly one hundred years. In that time, the continuing interaction of man and the environment has produced adaptations which are of special interest to a geographer. If any true understanding of the character of the Nanaimo area is to be achieved, these adaptations must be examined, the reason for their existence determined and their consequences weighed.

Analysis of the processes of continuing interaction between man and the environment form one of the most important fields of research in modern geography. This study of such processes as they have occurred in one area may make some contribution to the body of knowledge regarding these phenomena.

Some of the terms used in the study require definition of the exact meanings assigned to them.

Part-time farming - Farming which does not occupy all the working time of the operator, nor supply the main source of his income is considered to be on a part-time basis. In the field, a farm was considered to be part-time when it was less than ten acres in extent or had less than ten acres cleared when there were no evidences of specialized practices.

Skilled miner - The men who do the actual cutting of the coal are considered, in the industry, to be skilled workers. Other skilled men include the men who supervise the firing of explosives, and those who are responsible for maintenance of safe working conditions. Unskilled workers include those men engaged in loading coal, and in the handling of it at the tibble and washery.

Tipple - A tipple is a structure at the pit-head to which the coal is elevated and from which it is discharged into railway cars.

Small mine - A small mine is one in which the owners take an active part in its operations. No arbitrary limit is placed on the size of the production or labour force of a small mine.

Specialty crops - Livestock reared or plants cultivated to supply products giving comparatively high cash returns are considered to be specialty crops.

Tertiary industries - All occupations which are not productive of goods are classed as tertiary industries. They include not only the transportation, wholesale and retail industries, but also those which provide services.

Cultural landscape - The cultural landscape includes all the features which man has placed upon the earth's surface and which are at present in existence.

Urban - Settlements, the majority of whose inhabitants are not farmers, are considered to be urban in character.

House types - All buildings erected are considered to be "houses", irrespective of their purpose.

Geological terms will be explained as they are introduced.

In the first part of the study the background of the Nanaimo area, from both the historical and the geographical point of view , is examined. The progress of coal-mining itself is also examined. In the latter part of the study, an inquiry is made into the effects which coal mining has had upon the economic life, the cultural landscape and the population. Some conclusions are made regarding the value of these effects and regarding future possibilities for the area.

Little geographical material has been written concerning the Nanaimo area itself. In 1914, a memoir on the coal field was published by C.H. Clapp of the Geological Survey. A revision and extension of this work was contained in the paper published by A.F. Buckham of the Geological Survey in 1947. Much information has been obtained from these sources. Other papers on coal mining have been presented to the Canadian Institute of Mining and Metallurgy from time to time. These have also proved valuable.

One of the sections covered by the unpublished Soil Survey of the British Columbia Forest Service extended from Nanoose Bay to Ladysmith Harbour. This source is the only available one having a section dealing specifically with the agriculture of this area.

A Survey of the E. and N. Land Grant made by the Forest Service in 1938 contains the only detailed study of local forest resources as yet available.

Other sources which were of wider scope but which contained information on local activities included the Reports of the Minister of Mines for British Columbia, the Reports of the Chief Commissioner of Lands and Works, and The Climate of British Columbia, published annually by the British Columbia Department of Agriculture. Considerable use was made of the British Columbia Directories for various years from 1882-83 on.

Sources consulted in the Library of the University of British Columbia included the Reports of the Minister of Mines beginning in the year 1874, as well as many other government publications. In Victoria, the Soil Survey and the Survey of Forest Resources were consulted. Sources used in Nanaimo included the files of the Nanaimo Free Press and various compilations of local data made by the Nanaimo office of the British Columbia Forest Service. Information on building permits and zoning regulations was obtained from the files in the office of the Nanaimo City Engineer, where old maps of the city were also consulted.

Information was obtained from business people, private citizens and government officials in interviews and through correspondence.

The base map used in the field was the advance sheet Number 6 of the Soil Survey on a scale of 40 chains to the inch, issued by the Forest Service in 1943. Upon this was plotted the cleared and cultivated land as mapped by the Forest Service in 1937. This information was checked and revised in the field.

Detailed land use was mapped in parts of the two main agricultural districts, but the chief distinction was drawn between part-time and commercial farming in the preparation of the land use map. Other features noted in the field included the extent of settled areas, and the distribution of industrial and commercial organizations. Detailed maps were made of some of the villages in the area. The Assembly Wharf, coal mines and the premises of other industrial firms were visited.

Data for many of the maps were obtained from a variety of published sources and from interviews. The source of information for each map is noted on its fly-leaf.

CHAPTER II

THE NANAIMO AREA IN ITS PHYSICAL AND HISTORICAL SETTING

The city of Nanaimo and its surrounding districts lie in a physical setting typical of the southeast coastal plain of Vancouver Island. Along its whole extent the coastal plain exhibits few important variations of topography, climate, soil or vegetation. It extends only a short distance inland and few parts of the plain lie above the 500 foot contour. For these reasons, there are no profound differences resulting from either latitude or altitude throughout the region. However, there are many local variations in topography which produce slight climatic and other changes. In detail, therefore, the coastal plain exhibits a variety of landscapes which, added to the attractiveness of the climate, makes the region a pleasant place in which to live.

The Nanaimo area is dominated by the peak of Mt. Benson which rises rather abruptly behind the city. (See Figure 1). Near the coast are found two lesser uplands, the Woodley Range at the head of Ladysmith Harbour, and Cottle Hill which crowns the ridge lying between Nanoose Bay and Departure Bay.

Figure 1.

The Nanaimo Area - Place Names

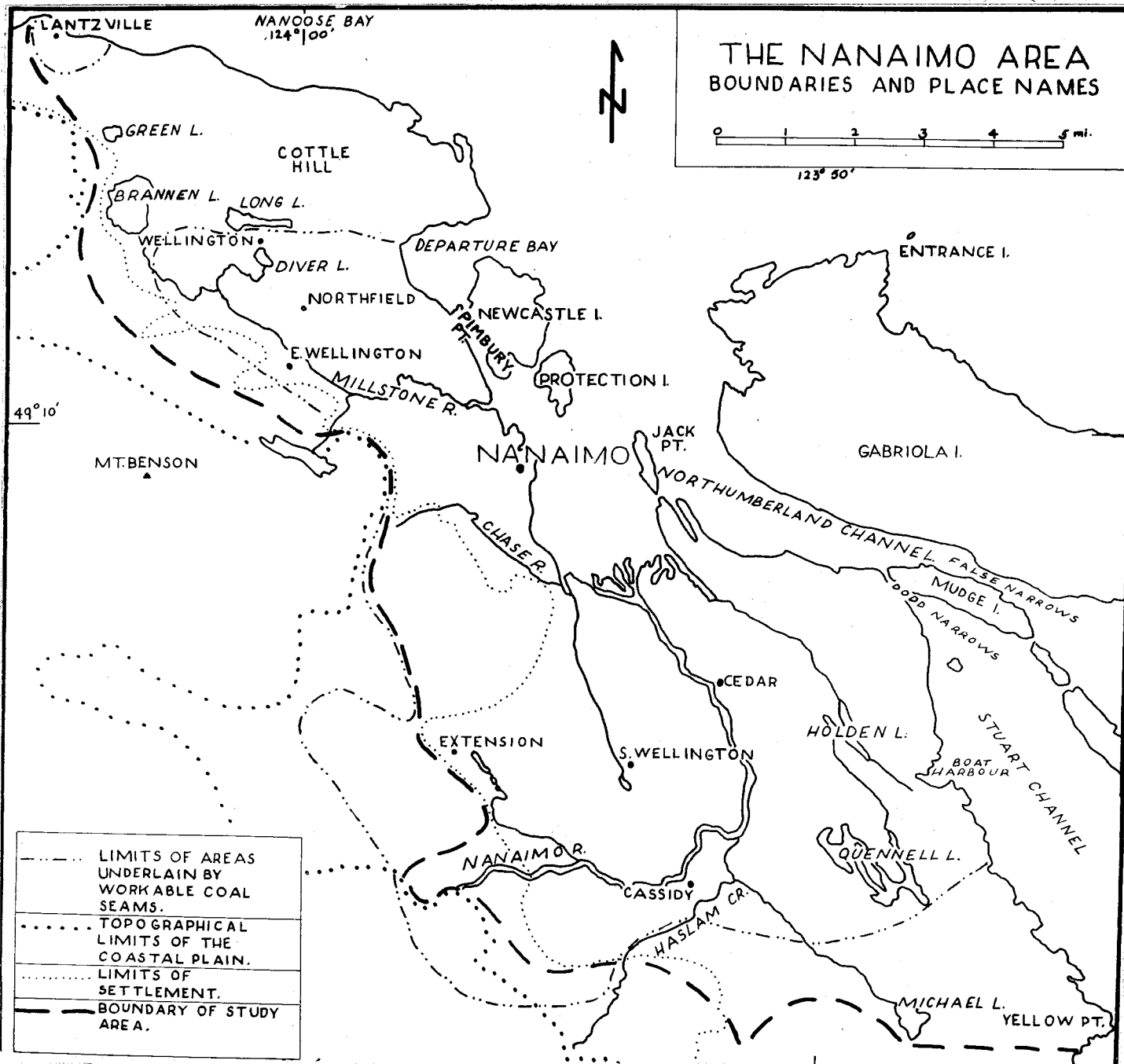
Base map: B.C. Forest Service, 1937.

Topographical boundary of the coastal plain.

Advance Sheet No. 6, Soil Survey
of southeastern Vancouver Island,
1943.

Limits of settlement based on B.C. Forest
Service Map, 1937.

Areas of workable coal seams: adapted from
Paper 47-22, Geological Survey of Canada.
by A.F. Buckham.



Between Mt. Benson and Cottle Hill lies the drainage basin of the Millstone River. The stream receives the waters of numerous creeks on the mountain slopes and drains Brannen, Long, Diver and Westwood Lakes. On the southern flanks of Mt. Benson, the small streams fall into Chase River and into the sea near the delta of the Nanaimo River. Other small river include the unnamed creek which drains Richard Lake, those comprising the Quennel-Holden drainage system to the east and that draining Michael Lake. The two large rivers of the area are the Nanaimo River and Haslam Creek. The latter flows into the main stream in the vicinity of Cassidy.

The indented nature of the coast-line and the prevalence of off-shore islands gives rise to a series of small connecting channels and arms of the sea.

Only three of the settlements in the area are located on the coast: Nanaimo and its surrounding districts of Brechin, Harewood and Chase River, Lantzville on Nanoose Bay and Departure Bay. Inland, from north to south, are found Wellington, Northfield, East Wellington, South Wellington, Cedar and Cassidy. The prevalence of numerous agglomerated settlements in the area indicates a fairly intense utilization of non-agricultural resources, although a high proportion of the surface is tree-covered.

The earliest European settlement was founded at Nanaimo in 1852 when the coal seams were first exploited. For many years thereafter, the history of the town and of the industry were one. The town and its tributary area enjoyed prosperity or suffered depression with the industry. Disasters in the mines were tragedies to the whole community. Strikes and violence disrupted community life equally as much as they did coal-mining. Only in recent years has the progress of the industry been of minor importance to the area, or have major developments in the community occurred which were disassociated from coal-mining.

The existence of coal at Nanaimo was first made known to the Hudson's Bay Company in 1850, but it was not until 1852, with the opening up of a Pacific coast market for coal that mining operations were commenced.¹

The first shipment from the field was one of fifty tons raised during an inspection trip by Governor Douglas in August, 1852.² In the same month, Joseph McKay, the company servant who first made the discovery of coal, was sent to the field to supervise operations. A short time later the miners who had been employed in an unsuccessful coal-mining venture at Fort Rupert were transferred to the workings at Nanaimo.³

¹ McKelvie, B.A., "The founding of Nanaimo," B.C. Historical Quarterly, Vol. 8, No. 3, 1944, p. 170

² *ibid.*, p. 173

³ *ibid.*, p. 176

The Hudson's Bay Company, through the Nanaimo Coal Company, continued to operate the mines until 1861. Workers for the mines during the early period were recruited in the British Isles. The first group of these to arrive was composed of twenty-two Staffordshire miners who, with their wives and families, made the sea voyage via Cape Horn in 1854.¹ These were joined at various times by others as the operations expanded. From the beginning, the population of the town has been of predominantly British origin. The scope of the industry and the size of the town were both restricted. In 1856, no coal was sold at all.² Mining operations were confined to the immediate waterfront vicinity and to Newcastle Island. The town occupied part of the narrow peninsula which today forms the present commercial district. From 1852 to 1861, the total coal production amounted to only 55,408 long tons.³

In 1861, the mines, the area held as coal lands, the townsite and the business establishments of the town were sold to the Vancouver Coal Company. This firm extended operations into the South Field, in the vicinity of Chase River. Production and employment showed considerable relative increase but the actual increase was small. The

1 *ibid.*, p.187

2 *B.C. Archives, Mem. IV, House of Assembly Correspondence Book*, p. 28, letter from Governor Douglas to the House, 8th June, 1857.

3 *Williams, Official B.C. Directory*, 1893, p. 51.

first great expansion in the industry occurred in 1869, with the discovery, by Robert Dunsmuir, of coal at Wellington. The Wellington mines commenced operations 1871. Three years later, the city of Nanaimo was incorporated.

The Robert Dunsmuir firm and the Vancouver Coal Company and their successors have been the chief operators in the Nanaimo field throughout its entire period of productivity. Both companies have undergone several changes of organization during their period of operation.¹ In 1889 the older company became known as the New Vancouver Coal Mining and Land Company. It was again reorganized in 1908 as the Western Fuel Company, becoming in 1918 the Canadian Western Fuel Company Limited and in 1921 the Western Fuel Corporation of Canada, Limited. This Company was bought by the Dunsmuir firm in 1928, but continued to operate until the last of its mines was exhausted in 1939. The Wellington firm was organized in 1871 as Dunsmuir, Diggle & Company. In 1883, the firm became known as R. Dunsmuir & Sons and in 1899 as the Wellington Colliery Company Limited. In 1910, the firm was reorganized as the Canadian Collieries (Dunsmuir) Limited, under which name it still operates. Some of these changes were no doubt made in response to changing economic conditions, but many appear to have been associated with changes in internal administrative policies of the companies concerned.

¹ A.F. Buckham, Paper 47-22 (map), "Nanaimo Coalfield, British Columbia," G.S.C., 1947.

Settlement in the Nanaimo area was, at first, closely allied to the expansion of the coal-mining industry. The earliest community of any size beyond Nanaimo itself was Wellington, although some few settlers had probably settled at an earlier date at Chase River. Departure Bay was established as the shipping point for the Wellington mines and a residential community developed along the shore. By 1876, the voters list showed a few farmers resident in Cranberry, Cedar, Mountain and Wellington land districts, as well as on Gabriola Island and at Departure Bay. Coal-mining activity provided the market for the farm produce of the time.

From 1880 to 1890, areal expansion of the industry led to the establishment of further settlement at Chase River, and to the development of a community at Northfield, both Vancouver Coal Company mine sites. Dunsmuir & Diggle began mining in the Millstone Valley in 1881. In 1882 a smaller firm began mining in the same vicinity at East Wellington.

The next development of settlement occurred about 1900 when the Wellington mines were exhausted. A new section of the field was opened up at Extension; that mining village and, later, Ladysmith, being established as a result.

Mining was commenced at South Wellington in 1895, by the Dunsmuir firm and by another firm in 1907,¹ but full-scale

¹ Clapp, C.H., Geology of the Nanaimo Map Area, Mem.51, Geological Survey of Canada, Ottawa, 1914, p. 5.

development at South Wellington came with the period of activity during World War I.

The last coal-mining settlements were established during World War I. Cassidy was founded as the company town of the Granby Consolidated Mining, Smelting and Power Company in 1917.¹ Lantzville was also established as the Company town of the Nanoose Wellington Colliery Company in that year.

Settlement at Cedar was less definitely associated with coal-mining but increased through time as the population of the whole area expanded.

The decade from 1880 to 1890 marked the period of greatest development in the Nanaimo field, due in part to the growing importance of the whole Pacific Coast region. In 1886, the Esquimalt and Nanaimo Railway was built by the Dunsmuir Company to provide access to the Victoria market. During the same year the transcontinental railway line came into operation and the city of Vancouver was founded. These two developments made possible the establishment of a market which became increasingly significant to the Nanaimo field. Mining expansion during this period was reflected in an increase in population in Nanaimo and its surrounding districts. Schools and roads were built to accommodate the growing population beyond the city.

Neither the community nor the industry, however, experienced progressive development and continued well-being.

¹ British Columbia, Report of Minister of Mines, 1917.

The difficulties of mining operations and the deficiencies of prevailing equipment and methods led to many serious disasters. The worst of these was the explosion at Number One mine of the Vancouver Coal Company on May 3rd, 1887, in which 150 lives were lost. Such disastrous explosions occurred at various times during the early years. Later on, the greatest danger was caused by flooding, when neighbouring operations broke through into abandoned pits. The necessity of working in such hazardous conditions must have had incalculable sociological effects upon the community.

From 1890 until World War I economic instability and labour trouble beset both industry and population. During the early 1890's, the competition of coal from Australia and Britain reduced the demand for Nanaimo coal. A depression ensued from which recovery was not made until 1894.¹ Periods of depression and boom were experienced in the first decade of the twentieth century, probably associated with the first encroachment upon the coal market by fuel oil.

The most serious disruptions of the period were caused by discontent among the employees. In 1907, a strike which had been called in an attempt to oust Chinese labourers from underground workings was settled through the efforts of W.L. McKenzie King, then Deputy Minister of Labour in the Federal Civil Service.²

¹ Begg, Alexander, History of British Columbia, William Briggs, Toronto, 1894, p. 461.

² Vancouver Daily Province, July 24, 1950.

The most serious strike was, however, that which began in the autumn of 1912 and was not finally settled until after the outbreak of war in Europe. The strike broke out in September, 1912 in the Cumberland mines of the Dunsmuir firm and spread almost immediately to the company's Extension collieries.¹ In May, 1913, the United Mine Workers of America joined the strike affecting all other operations in the Nanaimo field. Agreements were reached with the other companies in September, 1913, but it was not until October, 1914, that the Extension mine was re-opened.² Much bitter feeling was engendered by the strike; several outbreaks of violence occurred, and the militia was called in to maintain order. Greek strike-breakers were employed. Other European immigrant workers employed in the mine, however, supported the strikers. Vivid memories of those tense times still remain in the minds of the people who witnessed the events.

Apart from any other considerations, the economic results of the strike were most serious. When the strike began, the market was absorbing all coal produced quite readily. When the source of coal was cut off, and its future restoration appeared remote, many consumers turned to petroleum from California as an alternative fuel. This

¹ Newton, John, Inspector of Mines, Nanaimo in Report of Minister of Mines, 1913.

² Report of Minister of Mines, 1914.

competing fuel which had been gaining in popularity was thus able to secure a position on the market which it never afterward completely relinquished. Collieries operating on a part-time schedule with reduced staffs were easily capable of supplying the demand for coal at the beginning of 1914. One mine, the Brechin workings of the Western Fuel Company, was entirely abandoned as a result of the strike. The effect on local business firms was severe. Some of those merchants who attempted to extend credit to the strikers and their families were forced into bankruptcy as a result. Decreased community purchasing power affected all commercial activity in the area.

The recession caused by the strike was, perhaps, dispelled more rapidly than might have been expected by the stimulus of World War I. By 1916, production had returned to its previous level, although employment was still less than in 1912. The abnormal industrial activity of the war years was only temporary in effect, however, and only obscured the inroads upon the market being made by petroleum from California.

The last period of mining prosperity in the field began during the war and continued until 1923. After that year, a decline in employment and production began which has continued intermittently until the present day. This decline in employment and production was occasioned not merely by

adverse market conditions, but by the approaching exhaustion of the Nanaimo seams. Even before the depression, the effects of declining prosperity were felt in the area.

The depression merely accelerated a process which was already well begun. In 1930, a small Nanaimo mine was closed, and development work on the Reserve mine of the Western Fuel Corporation was suspended. In 1931, Canadian Collieries Extension mines were abandoned. The following year the Granby mine at Cassidy, whose operations had been decreasing, was finally closed. Mining activity was confined to the South Wellington mine, Number One mine on the Esplanade (which increased its staff) and the small mines being operated in the abandoned workings of the larger companies.

The effects on the population were severe. Alternative employment was limited, and many turned to subsistence farming to aid in maintaining their families. The population of Nanaimo in 1931 had not yet showed a decline, perhaps due to the employment given in the old waterfront mine, but there appears to have been a decline in population throughout the remainder of the Nanaimo area. Coal-mining never again regained its former local importance.

As improved economic conditions followed the depression, the industry revived slightly. Three new mines

of limited reserve were opened, but employment did not greatly increase. When World War II broke out, a labour shortage developed which prevented any sizeable increase in operations. At present rates of production, MacKay foresees the cessation of large scale operations between 1956 and 1960, after which time only small mines will be in operation.¹

During the war, the importance of Nanaimo as a distributing centre came into real prominence. An army camp was established on the slopes behind the town. Commercial activity received considerable stimulation and, following the war, many of the men who had been stationed in the camp established permanent residence in the area. The surge of activity in Vancouver Island produced by the war, especially in the lumber industry, gave rise to the necessity for a trading, servicing and distributing centre. Because of its location, the Nanaimo area fulfilled this need.

The expansion of business activity and population during and following the war has, for the first time, been unrelated to the progress of coal-mining. Mine workers now form a small proportion of the total labour force. Two communities still depend upon mining, but all the others have turned to other forms of activity for which they possess some natural advantage.

One resource, the coal seams, has now been nearly exhausted, in the Nanaimo area. Increasing use is being

¹ MacKay, B.R., Coal Reserves of Canada, G.S.C., Ottawa reprint of Chap.I and App.A of Report of Royal Commission on Coal, 1946, p. 53

made of another resource, location. Although mining is now of insignificant importance, the effects seem likely to influence the future of the area in its new role for a longer period than the duration of the industry itself.

CHAPTER III

PHYSICAL GEOGRAPHY OF THE NANAIMO AREA

Certain factors of physical geography made possible the development of the Nanaimo area as a coal-mining district, thus setting it apart from other parts of the east coast plain of Vancouver Island. In general, however, the geographical environment is similar to that of the whole region.

I Location

The Nanaimo area lies on the coastal plain nearly due west of Vancouver, thirty-six miles across the Strait of Georgia. In relation to the rest of the Pacific Coast, the location of the city and its tributary area has proved to be of varying strategic importance according to different times and circumstances. With respect to the more immediate region, its location has proved to be of steadily increasing importance.

During its early history, the location of the coal-field near tide-water gave it access to the Pacific coast market, and particularly to the port of San Francisco. In spite of the fact that it was not on the main trade routes, the area had sufficient resources to attract shipping from the southerly sea-routes to the port of Nanaimo.

In later years its relative accessibility to San Francisco proved to be a disadvantage. The water-routes which had made possible the cheap shipment of coal later made possible a reverse flow of fuel oil from the California fields. The Nanaimo coal-field not only lost part of its bunkering sales to petroleum but also suffered invasion of its local market in the province of British Columbia to the competing fuel.

More recently, the location of Nanaimo with respect to Pacific Ocean trade routes has again proved to be an asset. Ships calling at Vancouver find it easy to make the short trip to Nanaimo to load lumber at the Assembly Wharf. Nanaimo has become one of the lesser ports which share in the activity of shipping attracted to the great port of Vancouver.

Locally, the strategic location of Nanaimo is more pronounced. It is the closest shipping point on Vancouver Island to Vancouver, and the densely populated lower mainland region. This fact of itself would not necessarily produce an important distributing point. The deciding factor has been the location of Nanaimo in relation to the populated area of Vancouver Island. Nanaimo is seventy-two miles from Victoria, fifty four from Alberni, sixty eight from Courtney and ninety-nine from Campbell River. (See Figure 2). The location of the coal-field was advantageous during the period

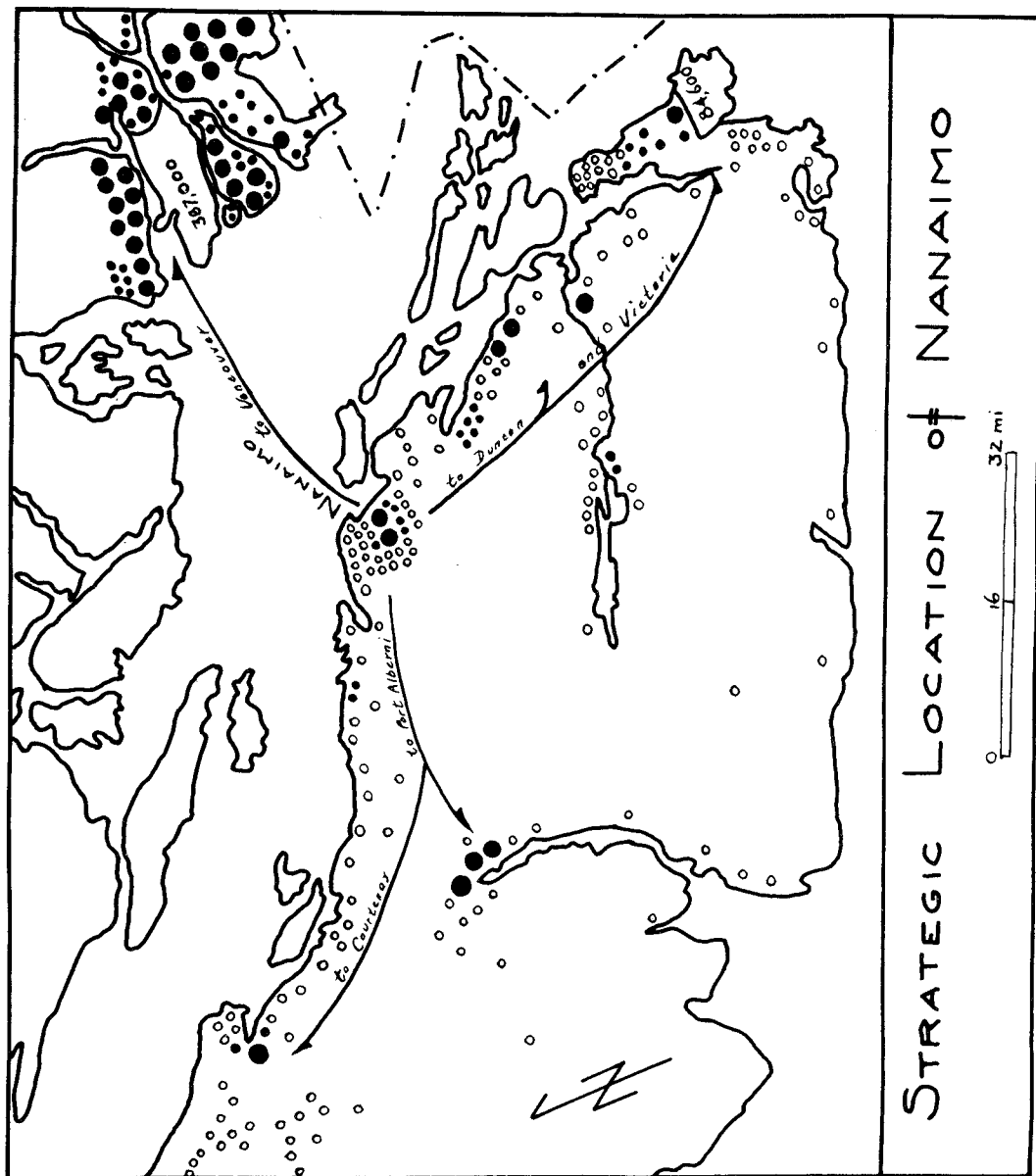
Figure 2.

Strategic Location

From: British Columbia, Distribution of Population, estimated as at December, 1945, map issued by Bureau of Vital Statistics, Victoria.

- 2500 in organized territory
- 250 in organized territory
- 250 in unorganized territory.

Total populations of Vancouver and Victoria given as a whole.



of greatest coal-mining activity. The location of the port and its facilities has been the greatest single factor in permitting renewed development since mining has declined.

II EXTENT AND BOUNDARIES OF THE AREA

The Nanaimo area of this study is limited to that part of the coastal plain which has been dependent upon the Nanaimo coal-field for its prosperity. In particular, it includes only those districts which today form the immediate hinterland of the town. This is the area from which the local labour force is drawn, and in which locally centred industry operates. It is the area in which the city itself is the main shopping and functional centre for the population. The exact boundaries of the area were determined on a basis of several geographical and economic factors.

The boundary between the coastal plain and the interior mountains is not always obvious, since the "plain" itself is a region of rough topography. The Soil Survey of 1944 has drawn this boundary through the zone where increasing slope and the presence of rock outcrops indicates the margin of the plain. From the point of view of topography alone, this boundary is valid. (See Figure 1, p.8).

Within the coastal plain, the extent of workable coal seams forms the nucleus of the Nanaimo areas. (See Figure 3).

The districts where mining operations were carried on

Figure 3.

Geology

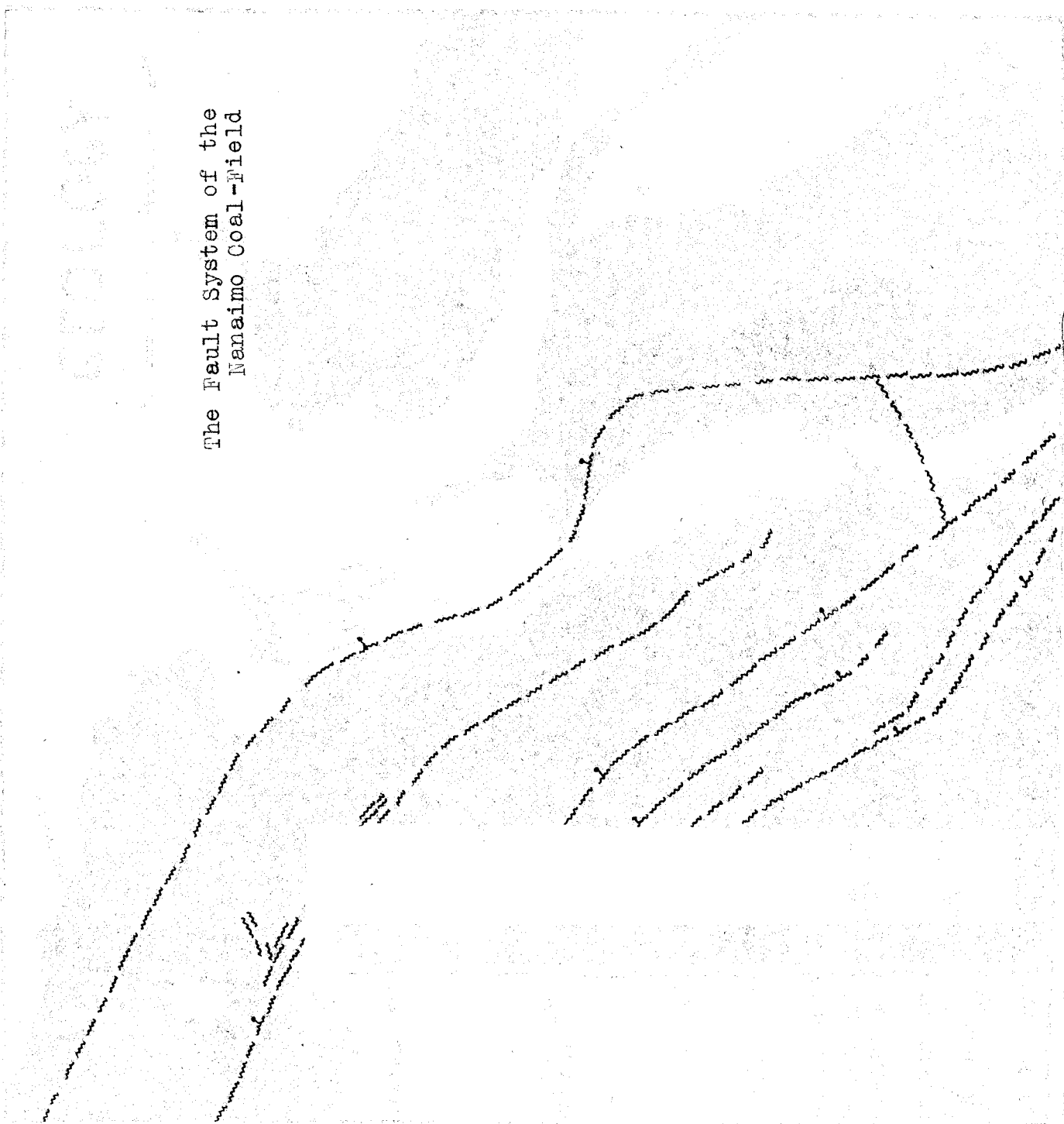
From Paper: 47-22, Geological Survey of Canada

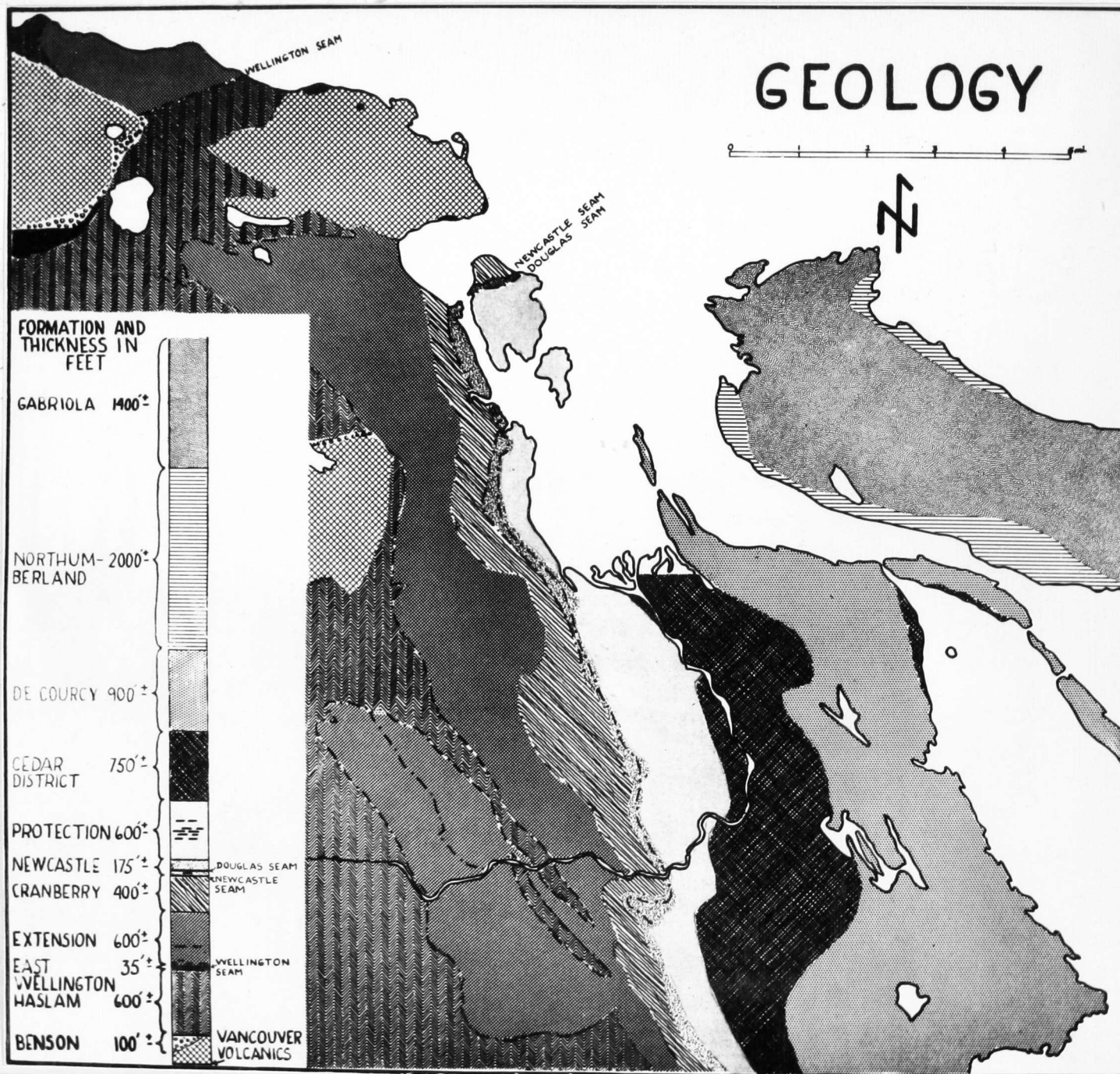
"Nanaimo Coalfield, British Columbia," by

A.F. Buckham, 1947.

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The Fault System of the
Nanaimo Coal-Field





are confined to the seaward portions of the area underlaid by Cretaceous sediments. The extent of the area beyond this geological core has been determined upon the basis of human use.

Permanent settlement in the vicinity of Nanaimo is stabilized in regard to its inland limits. In 1937, the British Columbia Forest Service prepared a map showing, among other things, the land cleared for settlement and cultivation at that date. Changes have occurred within the limits of the settled area but its westward margin remains essentially the same today.

The extent of the Nanaimo area along the coastal plain has been determined on the basis of past participation in coal-mining, coupled with present function in the distributing economy of today. The area included in this category extends from Lantzville on the south shore of Nanoose Bay. It excludes Ladysmith which, although founded as a point for shipping coal, today pursues an existence completely divorced from the activity of the Nanaimo area. The southern boundary of the area thus passes through the junction of two roads which mark the southern extent of the area dependent upon Nanaimo for its prime necessities. It follows the northern boundary of the Indian Reserve on Kulleet Bay, whose inhabitants have had little if any association with Nanaimo itself.

The Nanaimo area includes only those off-shore islands, Protection and Newcastle, where active mining operations were pursued.

The Nanaimo area so defined extends for about 18 miles northwest-southeast and varies in width from about two to seven miles. The total area of the district is about one hundred square miles.

III GEOLOGY

Geological conditions have imposed difficulties upon the coal-mining industry of the Nanaimo field. While the field could not have been regarded as a marginal producer during its most productive years, it did, nevertheless, suffer from disadvantageous production costs in its competition with other coal-mining areas.

Extensive work on the geology of the Nanaimo coal field has been done by Charles H. Clapp and, more recently, by A.F. Buckham, both of the Geological Survey. The following passages are a summarization of the memoir by Clapp, published in 1914 and of a paper by Buckham published in 1947.¹ Information was also obtained from the map of the field prepared by the latter and published by the Geological Survey in 1947.

The greater part of Vancouver Island is made up of a core of resistant crystalline rocks. Along both coasts, but more

1 "The Nanaimo Coal Field," Canadian Institute of Mining and Metallurgy, Transactions, vol. 27, 1947, p. 460.

extensively developed on the east coast are the Cretaceous sedimentary rocks which lie above the crystalline rocks and contain coal measures. These sedimentary rocks known as the Nanaimo series occur in five basins: the Suquamish, Alberni, Comox, Nanaimo and Cowichan basins. Only the lower formations of the series are found in the Cowichan, all formations are found in the Nanaimo and only the upper formations in the Comox basin. It is in these last two basins alone that the coal deposits are of commercial value.¹

The Nanaimo basin is separated from the Cowichan basin to the south and the Comox basin to the north by axes of crystalline rocks. It has a length of about thirty miles on Vancouver Island. Its width varies greatly, the average being about nine miles.

A. Historical Geology

The oldest rocks on Vancouver Island date from the late Palaeozoic and early Mesozoic, but those in the vicinity of Nanaimo date from the later time only. In the Triassic and Jurassic periods, extensive vulcanism in the region of Southern Vancouver Island produced the andesitic and basaltic lavas known as the Vancouver volcanics. Some sedimentation occurred also, resulting in the formation of the Sicker series. The Vancouver volcanics and the Sicker series, greatly deformed and metamorphosed, comprise part of the

¹ MacKay, Coal Reserves of Canada, p. 52.

Vancouver group. They are exposed in the ridge north of Departure Bay, in Mount Benson, and in Mount Hayes which rises southwest of the Nanaimo area. Together these rocks form the "basement" upon which the coal-bearing formations were deposited.

During the late Jurassic and early Cretaceous, probably concomitant with the irruption of the Coast Range batholith, the Vancouver group was deformed and intruded by granitic rocks. Folding and faulting were general along the British Columbia coast. The Georgia depression was first down-warped and the Island Ranges were first uplifted. A period of erosion followed, when the surface of considerable relief was developed which underlies the sedimentary strata in the Nanaimo area.

In the Upper Cretaceous, Vancouver Island subsided in relation to sea level; but rapid erosion continued in the unsubmerged portions, and by the end of the period, the Jurassic Cretaceous mountains were greatly reduced in elevation. The sediments from the higher area were deposited on the lower, submerged flanks of the ranges. These are the sediments comprising the Nanaimo series in which the coal seams are found.

The shore-line of the Cretaceous sea was not stationary. The strata of the series in the various basins exhibit a gradation which proves a general northward advance of the north shore.¹ Local variations occurred also. Deposition

¹ Buckham, A.F., "The Nanaimo Coal Field", Transactions C.I.M.M., vol. 50, 1947, p.462.

was so rapid that it sometimes overbalanced the effects of the subsidence and the strata were formed under marine, estuarine or even terrestrial conditions. Thus the rapid vertical and horizontal gradation of the sediments was produced which has formed one of the difficulties of mining in the field.

A further serious disadvantage accrues from the fact that the formation of the Upper Cretaceous coal seams took place in off-shore lagoons.¹ Conditions at the time of deposition limited the quantity of the reserves and also impaired the quality of the coal contained in the seams.

The period of erosion and sedimentation was brought to an end in the early Eocene by mountain building and igneous intrusion.. The whole British Columbia coast was subjected to compression and faulting.² In the Nanaimo basin, the disturbance caused movement on previously existing fractures.

Uplifting in Eocene time resulted in a period of intense erosion throughout much of the Tertiary during which the mountains were greatly reduced. In the late Pliocene, widespread uplift took place in the Cordillera region, the lands near the coast being elevated about 2000 feet. The succeeding cycle of fluvial erosion had advanced only to an immature state by the time of Pleistocene glaciation.³

1 *ibid.*, p. 470.

2 Peacock, M.A., "The Fiord Land of British Columbia", *Bull. G.S.A.*, vol. 46, 1935, p. 680.

3 *ibid.*, p. 686.

At the end of the Pliocene, the underlying crystalline rocks were partially exposed. The softer sedimentary rocks were eroded into subsequent valleys, and the more resistant strata were left as upstanding cuesta-like ridges.¹

Two periods of Pleistocene glaciation occurred in the Nanaimo area. During the first, or Admiralty epoch, the area was severely glaciated. Few deposits of that time are found in the Nanaimo area. Although the general subsidence of the coast is placed by Peacock at the end of or following the Pleistocene glaciation,² some earlier sinking must have taken place in the Nanaimo area, for the Puyallup inter-glacial deposits are partly of marine origin.³ These deposits were eroded in some places by the second, or Vashon, glacial advance, when two glaciers flowed into the sea in the Nanaimo area. These last glaciers retreated rapidly, and a large delta was formed at the shore-line of that time.

Along the British Columbia coast, great subsidence near the end of the Pleistocene time has been followed by partial recovery in the Recent period.⁴ In spite of the uplift, the coastline in the vicinity of Nanaimo still presents a drowned appearance. The elevation of the pro-glacial delta, about

¹ Clapp, C.H., in "Coal Fields of British Columbia", D.B. Bowling ed., Mem., 69, G.S.C., 1915, p. 94.

² Peacock, p. 691.

³ Clapp, p. 92.

⁴ Peacock, op.cit., 691

four hundred feet, indicates uplift in the area of at least that amount. This movement has rejuvenated the rivers causing them to terrace the glacial deposits and cut canyons in the underlying sedimentary rocks.

On Protection and Newcastle Islands rock debris mantles the country rock. A local shale formation has weathered to form a moderately fertile soil on the mainland of Vancouver Island.¹ Recent deltaic and swamp deposits have also been formed.

B. Description of Formations

The basement rocks underlying the Nanaimo series are composed of the Vancouver group and the later intrusive rocks. The former is represented in the Nanaimo area by meta-andesites (Vancouver Volcanics) and the cherty and slaty rocks of the Sicker series.² The intrusives in the basement rocks include gabbro-diorite, Saanich granodiorite and Sicker gabbro or gabbro porphyrite. It was chiefly from these rocks that the sediments composing the Nanaimo series were derived.

Almost every formation in the Nanaimo series exhibits considerable variation in character throughout its area. Only those formations in immediate contact with the seams have had much influence upon the coal-mining industry since their variations affect the character of the floors and roofs of the seams.

1 Spilsbury, R.H., Soil Survey of Vancouver Island, B.C. Forest Service, 1944, p. 47.

2 Clapp, op. cit., p. 38.

The three commercial seams of the Nanaimo field are found in the lowest third of the series. The first, the Wellington seam, lies only about 700 feet above the base of the series. About 1000 feet over the Wellington lies the Newcastle seam. The Douglas seam lies sixty feet above the latter. The total thickness of the formations overlying the Douglas seam amounts to nearly 5000 feet (See Figure 3). Erosion has removed the greater part of the strata. At the inland margins of the field the seams commonly reach the surface, and coal was usually mined at a depth of less than 1000 feet below the surface.

Below the Wellington seam lie the Benson basal conglomerate and the Haslam formation, the latter a fairly thick deposit of marine shale. The floor of the seam is formed by the East Wellington sandstone. This rock is usually firm, forming a fairly stable floor for the seam. In a few places, however, a bed of shale one foot thick may lie below the coal.¹

The Extension formation composes the roof of the Wellington seam. The most characteristic rock of this formation is a fairly strong conglomerate. The roof of the seam is less uniform than the floor, however, for in places it may be formed of sandstone or sandy shale. Overlying the Extension formation, and forming the floor of the Newcastle seam, is the

¹ Bückham, *lp. cit.*, p. 468.

Cranberry formation. In many places, this is a thin-bedded sandstone, but in others it may be a shaly sandstone. The roof of the Newcastle seam is the Newcastle formation in which the Douglas seam is found.

The Douglas seam is the only one of the three to occur in the middle of a formation. The Newcastle formation which forms both its roof and floor is very variable. Most common of the Newcastle rocks is the grit which is exposed at Nanaimo. At South Wellington, the same formation is composed of sandy shales and shaly sandstones.¹ Both roof and floor of the Douglas seam, therefore, are of variable character.

Although some of the strata overlying the Newcastle formation contain thin interbeds of coal, no seam is of commercial thickness. The Protection formation, composed chiefly of sandstone, contains several thin seams. This formation is the equivalent of the one in which coal is found in the Cumberland field, but the stratigraphic positions of the seams in the two fields do not correspond.²

The remaining formations are, in ascending order, the Cedar District shales, the De Courcy sandstone, the Northumberland shales and sandstone and the Gabriola sandstone. The two last-named outcrop most extensively in the off-shore islands.

1 Clapp, op. cit., p. 61.

2 Buckham, op. cit., p. 468.

C. Structural Geology

The fault system of the Nanaimo coal field is the most important structural feature to affect the coal seams. This system forms part of a major fault zone which extends for about 70 miles along the eastern coast of Vancouver Island.¹ This zone, in turn, is only a small part of the fault system along the British Columbia coast.

The first period of widespread disturbance and faulting occurred in the latter part of the long period of Jura-Cretaceous intrusion and mountain-building.² In response to pressure from the northeast, a longitudinal fracture system concordant with the present coast line was developed. Although there is no direct evidence, the Nanaimo faults are considered to form part of the system.³ (See Figure 3, p. 25).

The second period of major disturbance occurred in the early Eocene. At that time, nearly equal forces are thought to have exerted pressure from both the northeast and southwest.⁴ In the Nanaimo area, movement was renewed on the faults which already existed, and because the coal bearing sedimentary strata had been deposited during the interval, the measures were involved in this disturbance.

In the lower strata of the Nanaimo field, the stress of

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- 1 Buckham, op. cit., p. 463.
 - 2 Peacock, op. cit., p. 683.
 - 3 Buckham, op. cit., p. 466.
 - 4 Peacock, op. cit., p. 685.

the disturbance was released by fracturing. Farther up, sharp rolls were formed and near the surface, the strata were gently folded. As coal is a soft rock, much of the shearing and slipping took place within the beds themselves, so that some of the coal deposits are slickensided. The strike of the rolls and faults varies, but is generally northwest. Folding and faulting, and their resultant consequences, are more pronounced in the south and west parts of the field, where the faults are more closely spaced.

Folding is evidenced by the pinches and swells common in the seams of the field.¹ The good coal has migrated along the limbs of the fold to points where pressure was less, leaving concentration of rash² in the pinches. Where the stress was not released by fracturing, the residual stress remaining in the folds is believed to have been responsible for the occurrences of "blow-outs"³ which hampered mining operations particularly in the Douglas seam.⁴

1 Buckham, op..cit., 471

2 "Rash" is the local name for the dirty, slickensided coal in the pinched parts of the seams. Its ash content is about 55 per cent.

3 When mining operations release some of the pressure on the seams, outbursts of gas and finely divided coal occur, which are locally known as "blow-outs".

4 Buckham, loc. cit.

D. Economic Geology

The original conditions of deposition of the coal-measures, in shallow lagoons along the coast, have probably had more profound effects upon the coal-field than has any other geological factor. The area of the coal-field in its original form was thus quite limited, since the coastal lagoons did not attain the size of the vast inland swamps in which many coal-fields were deposited. On Vancouver Island as a whole, mining experience has taught that the best coal is found close to the outcropping of the seams.¹ The coal-measures deteriorate seaward as the outer limits of the Cretaceous lagoons are approached. Buckham postulates similar deterioration landward, and, taking into consideration the seaward extent of the workable seams and the distance inland of the Vancouver Island Range, concludes that about half of the original deposits have been lost in post-Upper Cretaceous erosion.²

The original reserve is thus known to have been limited and the present reserve to be approaching exhaustion.

The extent of workable coal within the limits of the field has also been restricted by original depositional conditions. Peat could form in reasonable thickness only when the shoreline remained stationary for a considerable period of time.³

1 Buckham, op. cit., p. 472.

2 loc. cit.

3 loc. cit.

The rarity of a stable Upper Cretaceous shoreline is attested by the fact that in 7000 feet of sediments the total thickness of mineable coal averages less than twenty feet. These variations are attributed to the original lagoon conditions. The lagoons formed in bays, but not on straight stretches of coast or in front of headlands.¹ Headlands, wave action and the action of streams discharging from the uplands are thought to account for the areas of dirty coal, whereas areas of good coal are thought to have been deposited in the lee of the headlands.

The prevalent partings of shale or "wants",² are also thought to have originated with the conditions prevailing in the lagoons. The sand-bars protecting the lagoons from the sea are thought to have been broken by violent storms, permitting the invasion of muddy sea water and the consequent silting of the lagoon floors.³

The Wellington coal seam, lowest of the three seams mined, has proved workable in an area twelve miles long and about one mile wide, from Wellington to Extension. Its thickness is extremely variable "from virtually nothing to nearly thirty feet", but its average thickness is from four to seven

1 Buckham, op. cit., p. 470.

2 "Wants" are thick interbeds, or "partings", of shale. In places, they entirely displace the coal, so that the interval between the floor and roof of the seam is completely filled with rock.

3 Buckham, loc. cit.

feet. The irregularities are caused by folds or bends in the roof, (see Figure 4) the East Wellington sandstone floor being fairly regular. There are few persistent partings in the seams near East Wellington but near Extension the seam contains three fairly consistent "benches"¹ separated by "rash" or shale. There are several minor seams overlying the main Wellington seam which have occasionally been mined in conjunction with the larger one. The main seam has been mined at Wellington, Northfield, East Wellington, Wakesiah (behind the city of Nanaimo), Extension and White Rapids.

The middle seam, known as the Newcastle, is the least extensive of the three. It has proved workable in an area two miles long by one and one half wide under Newcastle and Protection Islands. It is the most regular seam, varying where worked, from 20 inches to 80 inches, and contains few partings. The Newcastle seam has been mined at Brechin mine (Northfield Number 4) and, in conjunction with the Douglas seam, at the Esplanade mine in Nanaimo.

The Douglas seam has proved workable in an area nine and one half miles long by one and three quarters wide. Its thickness is at least as variable as that of the Wellington seam, and averages about five feet. Variations in this seam are commonly caused by undulations in the floor. (See Figure 5).

¹ "Benches" is the name given to sections of the seam which are separated by persistent interbeds of shale.

Figure 4.

- a. and b. Sections of the Wellington seam near East Wellington, showing rolls.
(From Fig. 5, p. 106, Clapp)
- c. Sections of the Wellington seam near Extension; showing variation in thickness and quality. Sections 1 and 2 are 200 feet apart and sections 2 and 3 are 500 feet apart.

(From Fig. 6, p. 107, Clapp)

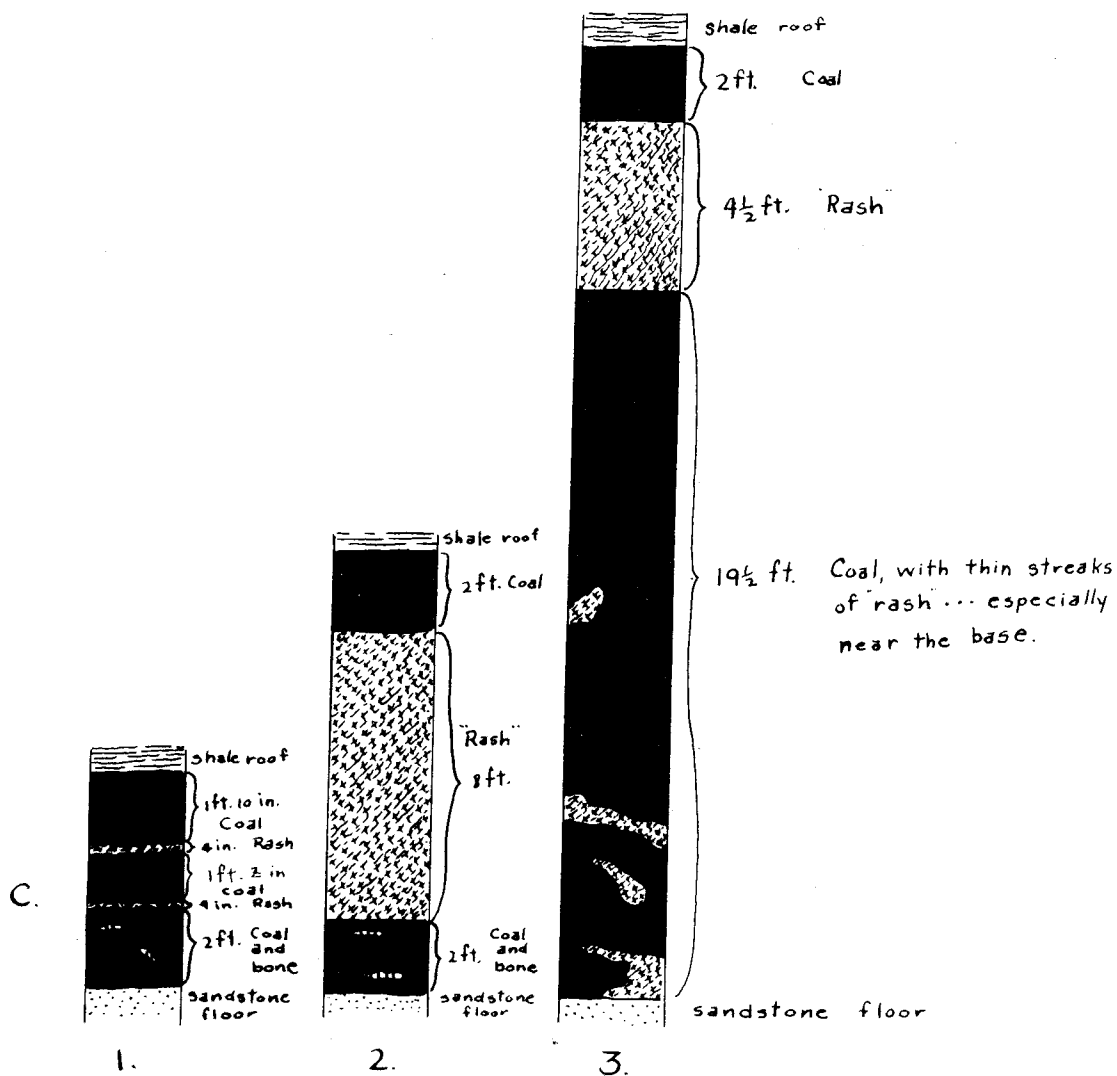
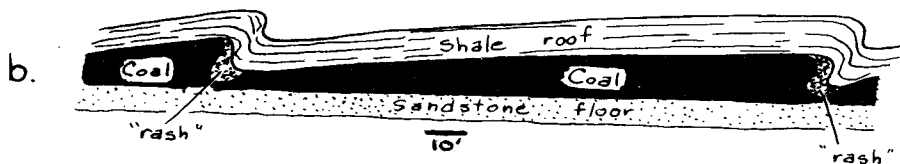
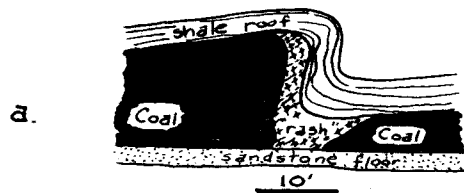
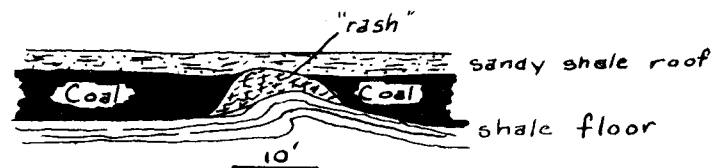


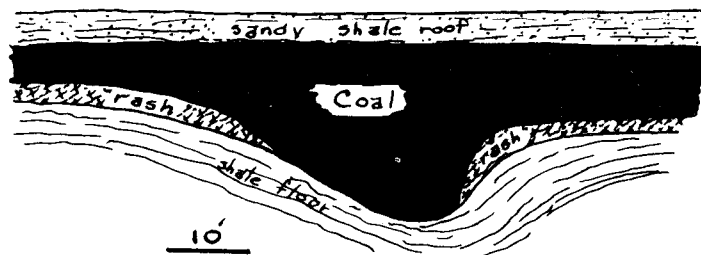
Figure 5.

- a. and b. Sections of the Douglas seam,
showing rolls.
(From Fig. 7, p. 112, Clapp)
- c. Section of the Douglas seam,
showing a parting of carbonaceous
shale, a "want" due to silting.
(From Fig. 8. p. 113, Clapp).

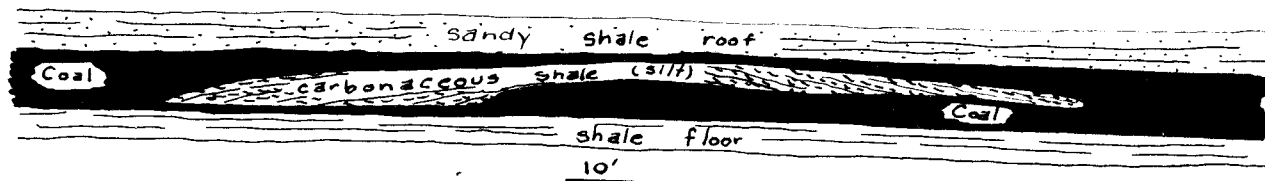
a.



b.



c.



Like the Wellington seam, it is most irregular in the southern part of the field, where the seams have been greatly sheared. The coal contains much "rash", as well as rock partings and "wants".¹ The Douglas seam has been mined at Nanaimo, on Protection Island, on the Indian Reserve at the mouth of the Nanaimo River, at South Wellington and at Cassidy.

The operators of the coal mines in the Nanaimo area have had to contend with many unfavorable conditions resulting from the geological character of the field. These have included high costs of mining and handling, dissatisfaction of consumers and dealers, and dissatisfaction among mine employees. In almost all cases, these difficulties originate in the irregularity of the seams.

The irregular areal distribution of good coal was particularly disadvantageous to exploratory work. The evidence obtained by drilling bore-holes was frequently very unreliable, and led to many false starts in developmental work.²

The irregularity within the seams themselves, resulting from pinches and rolls, caused much necessary inefficient operation. New areas within the mine were commonly concealed by rolls and faults, so that development work was costly and time-consuming. In many cases, it was impossible to use machinery for cutting. The instability of the seams prevented

1 Buckham, op. cit., p. 469.

2 Graham, Chas., "The Problems of the Vancouver Island Coal Industry", C.I.M.M., Trans., vol. 27, 1947, p. 460.

in places, the use of electrical equipment or explosives. The pinched areas of "rash" were obviously worthless and the clean coal in the swells could not be completely utilized either, since it was impossible to hold the ribs in the high soft coal.¹ So numerous were the rolls in the Cassidy mine in the disturbed southern section, that it has been estimated that hardly 20 percent of the tonnage removed was coal.

The frequency of "wants" and shale partings also proved a major source of difficulty. Because the presence of rock among the coal increased the costs of preparation and handling, and because its presence in the marketed product was detrimental to the reputation for clean coal upon which sales depended, the operators encouraged the miners to remove the rock at the coal face.² Nevertheless, a great deal of rock ~~did~~ make its way to the tipples and washeries. A yardage rate had to be paid to the miners for handling the shale. The costs of the extra work of hauling and washing the coal were estimated to amount to seventy-five cents per ton of coal mined.³ The following table indicates the difficulty of the Extension operations in comparison to those of Comox in the year ending June 30, 1923.⁴

1 Campbell, C. M., "Cassidy and the Douglas Seam," C.I.M.M., Trans., vol. 1924, p. 480.

2 Report of Royal Commission on Labour, British Columbia, 1914, p. M 17.

3 Graham, op. cit., p. 473.

4. Graham, loc. cit.

Tipple Production (tons)	Commercial Coal (tons)	Lost in Washing Amt. (tons)	%	Yardage paid in addition to regular tonnage rate.
Comox Washery 343,330	294,863	48,467	14.1	\$137,120
Ladysmith Washery 304,653	240,796	63,857	20.9	\$267,000

The methods used in handling the shale in the coal raised dissatisfaction among the mine employees. The miners were expected to remove as much rock as possible when loading the coal on to cars at the face. At the tipple, cars containing over a certain amount of rock, specified by the company, were diverted and dumped and the miner was docked a certain amount of pay. In excess of certain specified amounts, the car would be confiscated. If the amount of rock in the car were considered to be overly excessive, and if the miner were proved to have acted deliberately, he was liable to dismissal. The popularity of this system can be judged by its title of the "court house" system.¹ Furthermore, the miners working on contract were paid according to the difficulty of mining the coal. They had thus no certainty regarding the exact amount of their wages, and this also led to dissatisfaction.²

The "blow-outs" caused by the unreleased stress in disturbed seams also slowed up mining operations. The danger

1 Report on Royal Commission on Coal, 1914, p. 9

2 Report of Royal Commission on Labour, 1914, p. M18.

of accidents and fire necessitated the taking of precautions, while damage and fouling of the air following these outbursts slowed recovery of mine routine after such accidents.¹

Although many of the conditions discussed above were more serious in the southern part of the field, where development came last, the field as a whole always suffered from them. In the early days, this disadvantage was overcome by the distance of the market from competing sources of fuel, but this protection was lost early in the twentieth century.

The coals of the Nanaimo field are of high volatile "A" bituminous rank according to the classification of the American Society for Testing Materials.² That is, they contain less than 69% of fixed carbon calculated on a dry ash-free basis, but in the "moist" state in which they come from the mine, their calorific value is over 14000 British thermal units per pound. Their calorific value is thus lower than that of low-volatile bituminous or of anthracite coals. They produce considerable smoke and soot when hand-fired, owing to lack of combustion of their volatile components. These factors mitigate against their appeal to household consumers. Their value to industry depends to a greater extent on their cost to consumers. Their average ash content, 10.7 per cent, is fairly high among Canadian coals.

1 Report of Minister of Mines, 1921

2 MacKay, B.R., Coal Reserves of Canada, p. 53

Within the field itself, the quality of coal from different seams varies. The Wellington seam appears to produce the best coking coal of the three,¹ while the Newcastle seam cokes less readily than the others. The coal from the Douglas seam is of intermediate quality, but that from the south end of the seam appears to be of higher quality than that from the north end. It was in this district that the Cassidy mine was worked, the only one in the field which produced primarily as a source of coking coal.

The reserves of the Nanaimo field are now known to be approaching exhaustion, but for many years serious misconceptions regarding the magnitude of the field were commonly held. The great variability of the seams precluded the possibility of accurately estimating the reserves of the field. Moreover, the distance to which the measures extended under the sea was unknown. Clapp realized², however, that this distance could not be great, since the deposition took place in coastal lagoons. The basis upon which Clapp made his estimate was similar to that employed by Dr. D.B. Dowling in estimating the Canadian reserves in 1913; that is, it included all coal deposits over one foot in thickness to a depth of 4000 feet. The probable area of workable seams was estimated to be about 65 square miles, and the total area, including possible extensions, to be about 181 square miles. The volume

1 Clapp, op. cit., p. 108.

2 Clapp, op. cit., p. 114.

of reserves so estimated by Clapp amounted to 1,340,000,000 long tons.¹ In preparing his estimates of the Canadian reserves of mineable coal, MacKay has considered only those seams which have proved mineable in practical operations.² These vary from field to field across Canada with varying market conditions and the quality of the coal. For such fields as the Nanaimo, estimated reserves are taken to include "seams" not less than three feet in thickness and with a maximum depth of cover of 2500 feet. Only those deposits having a well determined extent are included in "probable" reserves. "Possible" reserves are those about which complete information is lacking. Only 50 per cent of the mineable reserve is considered to be recoverable by present mining practice.

The extent of the remaining coal reserves of the Nanaimo field, as of 1946, are shown in a table adapted from MacKay's report. (See Table I). For comparison, the total reserves of the Comox field (Cumberland and Tsable River) are included. The probable recoverable reserve of the Nanaimo field was, in 1946, about 1,030,000 long tons. In 1947 and 1948, a total of 570,379 long tons was produced.³ MacKay considered that operations would continue until 1956 or later⁴ but it seems probable that, at this rate of production, unless some of the

1 Clapp, op. cit., p. 101.

2 MacKay, op. cit., p. 14.

3 Report of Minister of Mines, 1947 and 1948.

4 MacKay, op. cit., p. 53.

TABLE I
RESERVES OF NANAIMO AND COMOX COALFIELDS ¹
(Thousands of Short Tons)

		Probable			Possible (additional)			Recoverable	
Seam		Thickness	Area	Tonnage	Thickness	Area	Tonnage	Pro- bable	Poss- ible
		used (in feet)			used (in feet)				
Nanaimo Coalfield									
Number 10	Douglas	6.0	93	976	-	-	-	488	-
South of Granby	Douglas	6.0	50	526	6.0	150	1574	263	787
Cedar	Douglas	-	-	-	5.0	6592	57680	-	28840
Chase River	Newcastle	-	-	-	2.0	70	246	-	123
Departure Bay	Wellington	-	-	-	2.0	177	620	-	310
Little Ash	Newcastle ²	5.0	4	34	-	-	-	17	-
White Rapids	Newcastle ²	3.0	138	724	-	-	-	362	-
White Rapids	Newcastle ²	2.5	11	48	2.6	85	372	24	186
Total				2308	60492			1154	30246
Comox Coalfield									
Cumberland				25896	59240			12948	29620
Isable River				14542	61754			7271	30877
Other				9946	168350			4973	84175
Total				50384	289344			24192	144672

1. MacKay, B.R. Coal reserves of Canada, pp. 102, 103

2. Should read "Wellington".

possible reserves are proved more definitely, large scale operations will cease before that date. Although the possible reserve is nearly 60 million tons, further large scale development, barring unforeseen demands, may be confined to the Comox field where reserves are larger and where mining operations are less hampered by natural difficulties.

The total production of the Nanaimo field from 1852 to 1948 was 46,240,036 long tons, exclusive of those years when complete returns were not published. If the approximate total be taken as 50 million tons the original reserve, now mined, would be 100 million tons. When the possible reserve is added, the total, 210 million tons, will be seen to be far below Clapp's estimate. The sociological effect of early unfounded public optimism followed by disillusionment must have formed an incalculable factor in the attitude of the people of the Nanaimo area.

IV TOPOGRAPHY

A. General

The Canadian Cordillera is divided into three great systems, the Eastern, the Interior and the Western systems.¹ The last of these includes the Coast Mountain area, the outer Mountain area, and the Coastal Trough between the two former. The Coast Mountain area comprises the Coast and Cascade

¹ Bostock, H.S., The physiography of the Canadian Cordillera, with special reference to the area north of the fifty-fifth parallel, Mem. 247, Geological Survey of Canada, 1948.

Ranges; the Outer area the coastal islands of British Columbia and Alaska, and the St. Elias Mountains. The Canadian islands, chiefly Vancouver and the Queen Charlottes, form the subdivision which Bostock has named the Insular Mountains. The Coastal Trough is the submerged structural depression which separates the islands from the mainland of British Columbia. (See Figure 6).

The Vancouver Range composes the greater part of Vancouver Island. These mountains having a general northwest trend are the maturely dissected remnants of an uplifted erosion surface, exhibiting today a general concordance of summit levels. In the south, where erosion was more intensive, the present elevation is about 1500 feet. Farther north, relief and elevation previous to the uplift were greater. The general elevation today is about 4000 feet, with residual peaks of over 7000 feet elevation. North of Quatsino Sound, the Island is made up of "patches of plain separated by low rolling ranges of hills".¹

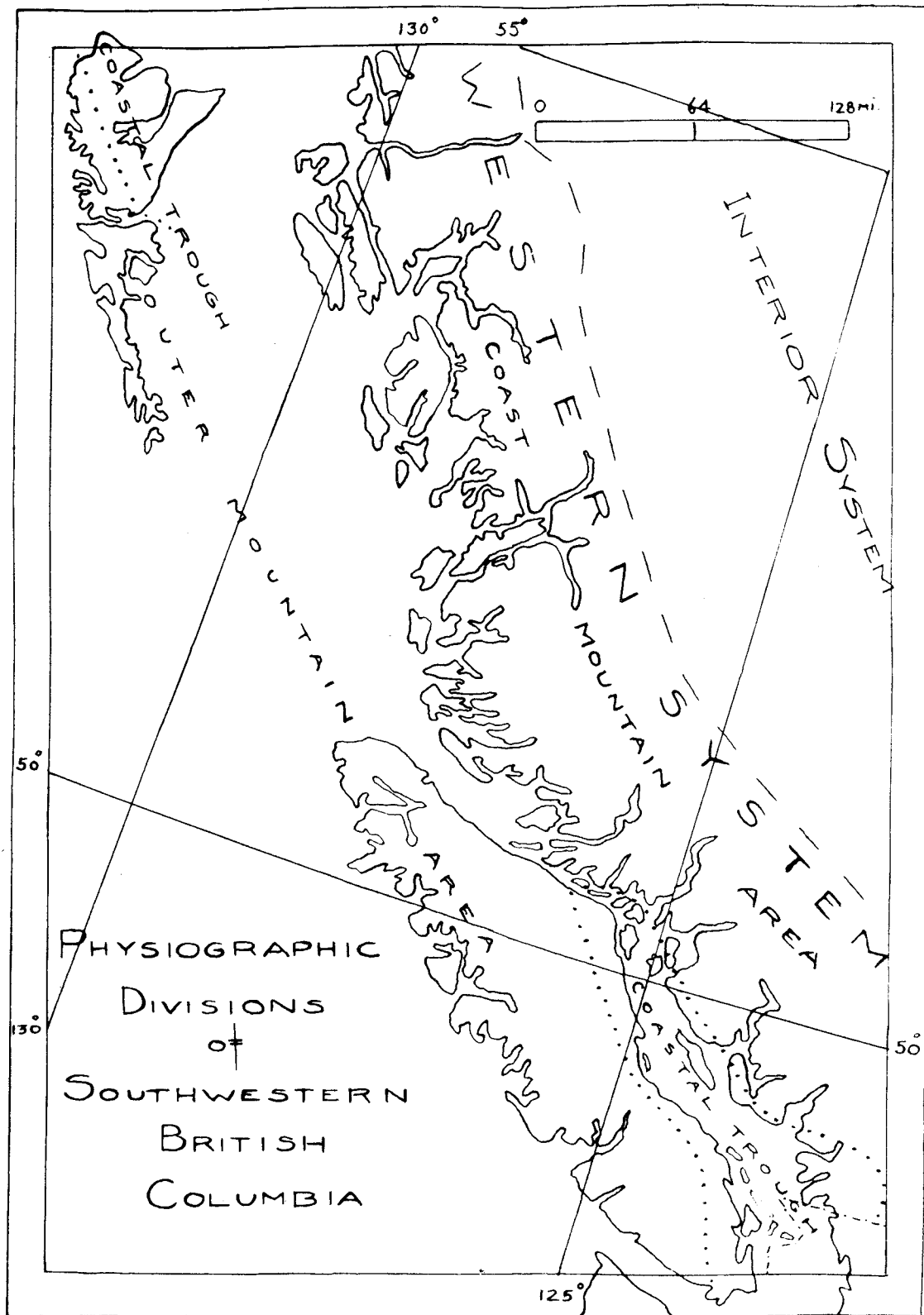
The Coastal Trough has been subdivided by Bostock into the Hecate Depression, lying between the Queen Charlotte Islands and the mainland, the Seymour Arch, a partly submerged "isthmus" connecting Vancouver Island with the mainland, and the Georgia Depression which separates lower Vancouver Island

1 Bostock, op. cit., p. 91.

Figure 6.

Physiographic Divisions

After map accompanying Bostock, H.S.,
The physiography of the Canadian Cordillera,
G.S.C., Mem. 247, Ottawa, 1948.



from the mainland. Clapp considers the Strait of Juan de Fuca to be a smaller transverse downfold.¹ The depression is about 25 miles wide and is almost completely submerged. The portions above water include the islands of the Strait of Georgia, a small coastal lowland on the mainland, and the east coast lowland of Vancouver Island. The Nanaimo area, therefore, is topographically part of the Georgia Depression. (See Figure 6, p. 51).

The east coast plain of Vancouver Island lies between the front of the Vancouver Island mountains and the sea. It runs from the southernmost end of the island north until it merges with the Seymour Arch, a distance of some 200 miles. In places the plain is almost pinched out, but its average width is eight miles. Little of the lowland lies above 500 feet elevation, and, as Bostock remarks, "much of it slopes from the sea to the mountains, but in the northern part some shallow valleys parallel the coast."²

B. Local

The coastal plain in the vicinity of Nanaimo exhibits many of the features common to the region as a whole. The front of the interior mountain range is fairly abrupt, and from it the land slopes uniformly but with considerable relief for such an area. Furthermore, the width of the lowland varies greatly in this locality just as it does in the larger region.

1 Clapp, op. cit., p. 18.

2. Bostock, op. cit., p. 89.

Underlying the Nanaimo district and surrounding it on three sides are the crystalline rocks of the Vancouver Range. The mountains to the west of the area are typical of central Vancouver Island. They attain an elevation of about 5000 feet, and are greatly dissected by stream and glacial erosion. They are less rugged, however, than those of the Coast Range batholith across the Strait of Georgia.

A ridge north of Departure Bay is the only part of the area where crystalline rocks are exposed at the surface. As might be expected, its topography is somewhat different from that in the rest of the area. Unlike the other uplands in the vicinity, it has a general east-west trend, a proportionately large summit area and is much broader in proportion to its length. The ridge has been quite severely glaciated; the north slope, in particular, having been steepened and smoothed by the probable passage of a glacier down Nanoose Harbour to the Strait.¹ (See Figure 7).

One of the peaks of the Vancouver Range, Mount Benson, does not lie within the area of this study, but it has important effects on local topography. One shoulder rises abruptly behind Nanaimo. In general the slope from mountain to sea-coast is steeper in the immediate vicinity of the city than at any other place in the area.

One of the most notable physiographic characteristics of the coastal plain within the Nanaimo area is the northwest-

1 Clapp, op. cit., p. 89.

Figure 7

Topography

Base map and contours above 500'
B.C.F.S. map, 1937, (Scale 1 inch to $\frac{1}{2}$ mi.)

East of 124° W - Topographic survey, 1912,
(scale 1 inch to 1 mile).

West of 124° W. - Nanaimo sheet, Dept. of National
Defence, 1941, (scale 1:25000)

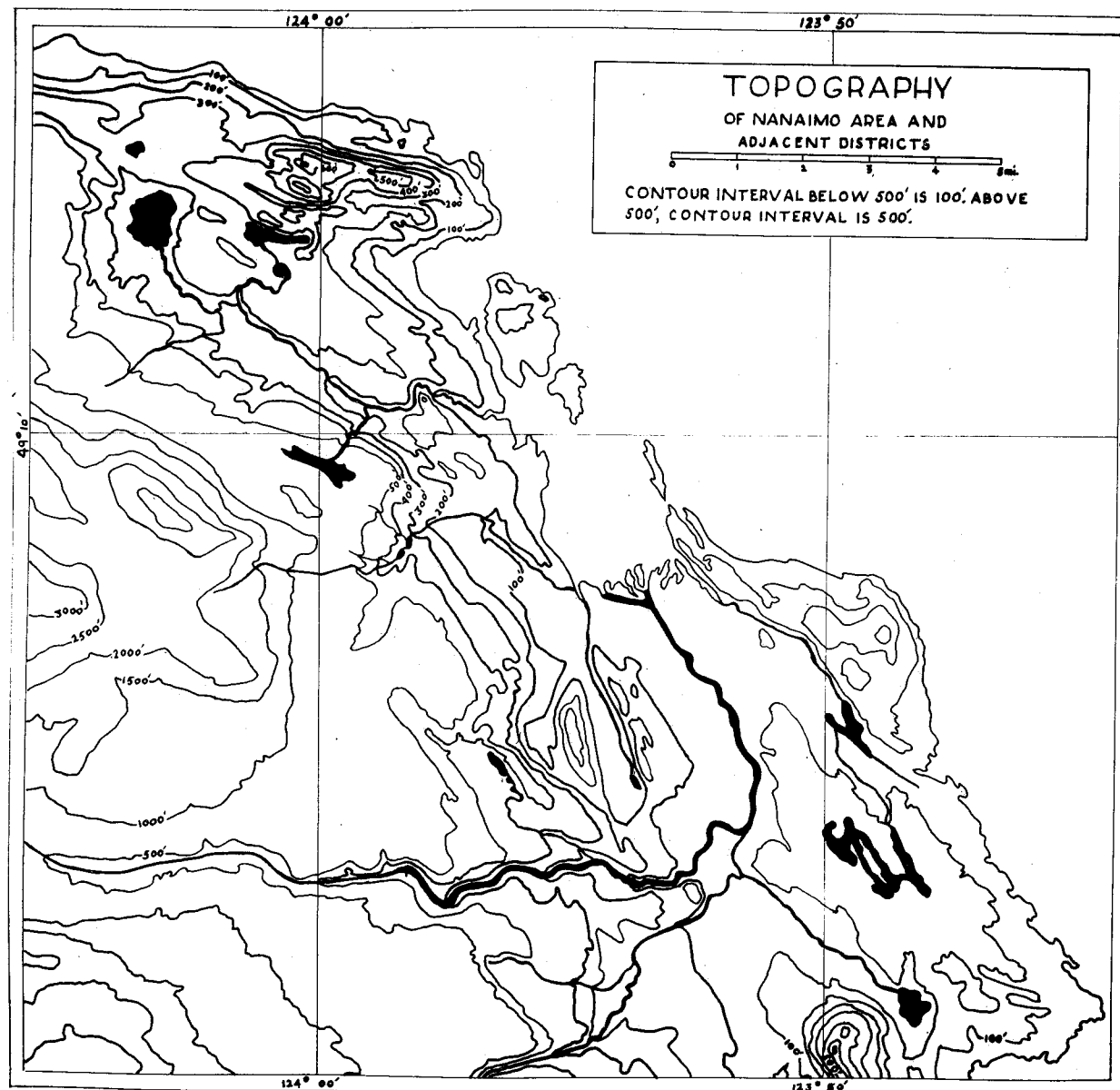


Figure 7.

southeast alignment of the surface features. This is an expression of the prevailing grain of the coastal region resulting from the period of Jura-Cretaceous disturbance.¹ This trend is seen in the coast-line itself, in the prevalence of cuesta-like ridges and rock outcrops, in the development of subsequent valleys and in the direction of the small rivers which flow in them. Some of the linear lakes in areas of rock outcrop also trend northwest-southeast.

The two largest rivers of the area, the Nanaimo River and its tributary, Haslam Creek, appear to be less completely governed by structure. These rivers were vigorous enough to continue down-cutting during the period of recent uplift. Both have now cut canyons across the sedimentary strata and do not follow subsequent valleys as do the smaller streams in the area. The canyon of the Nanaimo River occurs in the area of this study, but the canyon of Haslam Creek is cut in the marine shales west of the area. Below the confluence of the two, however, the Nanaimo river turns northwestward, following the course of a rather broad subsequent valley. The Nanaimo river has been able to terrace the deposits of the pro-glacial delta through which it flows. Owing, probably, to its decrease in volume since the glacial period and to its decrease in velocity as it enters the coastal plain, Haslam Creek becomes overloaded in its passage through these deposits and meanders

1 Peacock, op. cit., p.89.

throughout most of its course to its confluence with the Nanaimo River.

Two of the subsequent valleys dominate the topography of the area. The larger is the one in which the Nanaimo River flows, the second the valley of the Millstone River. The lower Nanaimo valley extends from the head of Ladysmith Harbour to the mouth of the Nanaimo River. It is comparatively broad and, because it is floored by less resistant strata, contains none of the cuervas seen in other parts. Deltaic deposits and soil formed by weathering of Cedar District shales have made it a good agricultural district.

The Millstone River rises in Brannen Lake, apparently formed in a depression in the glacial deposits. The valley floor is gently sloping, but is closely followed by a cuerva-ridge in its middle reaches. In its lower reaches, the river changes its course slightly and is cutting through the strata in its bed. The middle and upper valley forms a good, though small, agricultural district.

Two minor drainage systems are those of the Chase River, which drains the southeast flank of Mount Benson, and the Quennell Lake system of branching, linear lakes drained by small subsequent streams.

Local drainage varies widely within short distances. On rock outcrops and the glacial deposits, it is usually excessive. In the small subsequent valleys, lack of gradient commonly

causes restricted drainage and the formation of swamps. Only in the two main agricultural valleys, are adequate drainage conditions found in areas of any extent.

Ground water supplies are used extensively in the area beyond the city itself. The outlying settlements are not connected either to water or sewage systems. In these communities many homes have their own well and septic tank or outhouse, presenting the possibility of water pollution. The ground water supply is already inadequate during dry summers. The Nanaimo sulphate pulp mill also obtains its supply from underground wells near the confluence of Nanaimo River and Haslam Creek. It remains to be seen whether the water supply in the shallow wells of the surrounding districts will be adversely affected.

Topography has restricted the disposition and extent of arable land. In addition, it has to some extent affected the transportation pattern and the settlement pattern.

Although topography has not been the main factor governing the location of railway lines, they have followed the courses of some of the subsequent valleys in order to have more level grades. The side roads in outlying districts sometimes run along flat-lying rock outcrops, since these provide a firm natural pavement free from mud.

At the height of coal-mining activity the irregularities of the drowned coast-line permitted the development of small harbours for the shipping of coal.

The Extension formation which overlies the Wellington seam usually forms cuestas. Irregularities in the Newcastle formation containing the Douglas seam, if at shallow depths, may find surface expression in small cuestas with steep front slopes and gentle back slopes.¹ For this reason many of the original mining settlements, including Nanaimo itself, are located near such formations. Topography has been a strong, in some cases, a dominating influence on the development of their urban patterns.

V. CLIMATE

The climate of the British Columbia coast is typical of temperate Marine West Coasts. In winter, it is dominated by the depressions associated with the Aleutian Low. These great systems draw in masses of air of either maritime tropical or maritime polar origin. In their usual passage across the Pacific the extreme temperatures of the source regions are modified, and when the air masses reach the coast they bring no great extremes of temperature. Frontal rain associated with the storms is intensified by the orographic barrier of the coastal mountains, thus the greater part of the precipitation occurs in the winter half year. In summer, the extended influence of the sub-tropical High in the North Pacific approaches the coast. Summers on the British Columbia Coast are usually dry and sunny, but temperatures are kept moderate by the influence of the ocean.

1 Clapp, op. cit., p. 113.

Along the east coast of Vancouver Island, the climate varies from that of the mainland and outer coasts. The region lies in the rain-shadow of the Vancouver Island Range, and lower precipitation figures than at other coastal points are general. Precipitation increases, however, with nearness to the mountains, and stations backed by steep slopes experience more rainfall than those on wider parts of the plain. The variation between the precipitation figures of Nanaimo and Ladysmith typifies this tendency. (See Figure 8).

In general, precipitation on the east coast of Vancouver Island increases northward. Thus Nanaimo, which occupies a position mid-way between Victoria and Courtenay, has an intermediate rainfall also.

Victoria	26.65" per annum
Nanaimo	36.60" per annum
Courtenay	53.19" per annum ¹

Only two stations in the area and its vicinity, Nanaimo and Departure Bay, record meteorological data. Ladysmith ceased recording them in 1923, and Nanoose Bay in 1940. The statistics used to show the pattern of temperature and precipitation distribution are those of four stations, Nanoose Bay, Departure Bay, Nanaimo and Ladysmith for the years 1919, 1920, 1921 and 1923; the only years for which data for the four are available. Figures used in the climatic charts of

¹ Climate of British Columbia, Dept. of Agriculture, 1947.

Figure 8

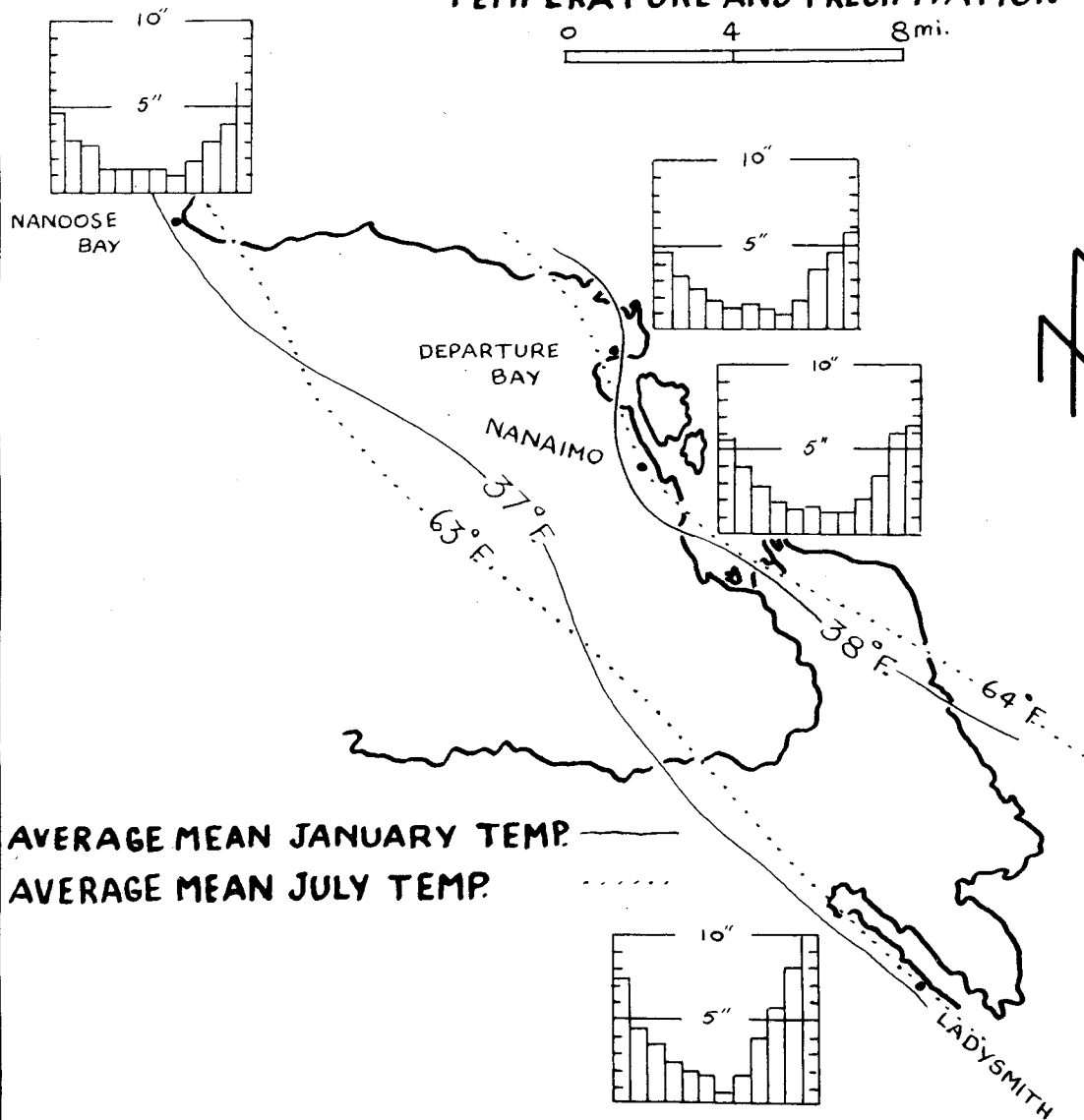
Temperature and Precipitation

Base map: Southerly portion, Vancouver Island, British Columbia Dept. of Lands and Forests, 1938.

Data from "Climate of British Columbia," B.C. Department of Agriculture.

TEMPERATURE AND PRECIPITATION

0 4 8 mi.



Nanaimo and Departure Bay represent the cumulative averages, in 1947, for 46 and 32 years, respectively.

A. Precipitation

Precipitation in the vicinity of Nanaimo is not evenly distributed (see Figure 8, p. 59). Ladysmith, owing to its situation at the foot of steep slopes, receives more precipitation than the other stations. Nanoose Bay receives less, perhaps because it is partially protected from rain-bearing south-east gales. Precipitation is proportionately high at Ladysmith in winter and low at Nanoose Bay, which further strengthens this theory. Departure Bay has slightly less rainfall than Nanaimo. (See Figures 9 and 10). However the former has a slightly higher proportion of summer rainfall than has the latter. This may again be due to topography. Nanaimo may receive a higher proportion of winter rainfall because Mount Benson presents a barrier to storms from the south-east, thus intensifying the precipitation associated with depressions.

B. Temperature

There are no great differences of temperature in the vicinity of Nanaimo. (See Figure 8, p. 59). Nanoose Bay and Ladysmith are slightly cooler than Departure Bay and Nanaimo. In July, Departure Bay is an average of one degree warmer than Nanaimo. A more distinct pattern of temperatures would

Figure 9.

Nanaimo

From "Climate of British Columbia,"

B.C. Dept. of Agriculture (Report for 1947)

STATION **NANAIMO**

LATITUDE

LONGITUDE

ALTITUDE

125'

MEAN ANNUAL TEMPERATURE

50°F

MEAN ANNUAL PRECIPITATION

36.60"

MEAN ANNUAL RANGE OF TEMPERATURE

27°F

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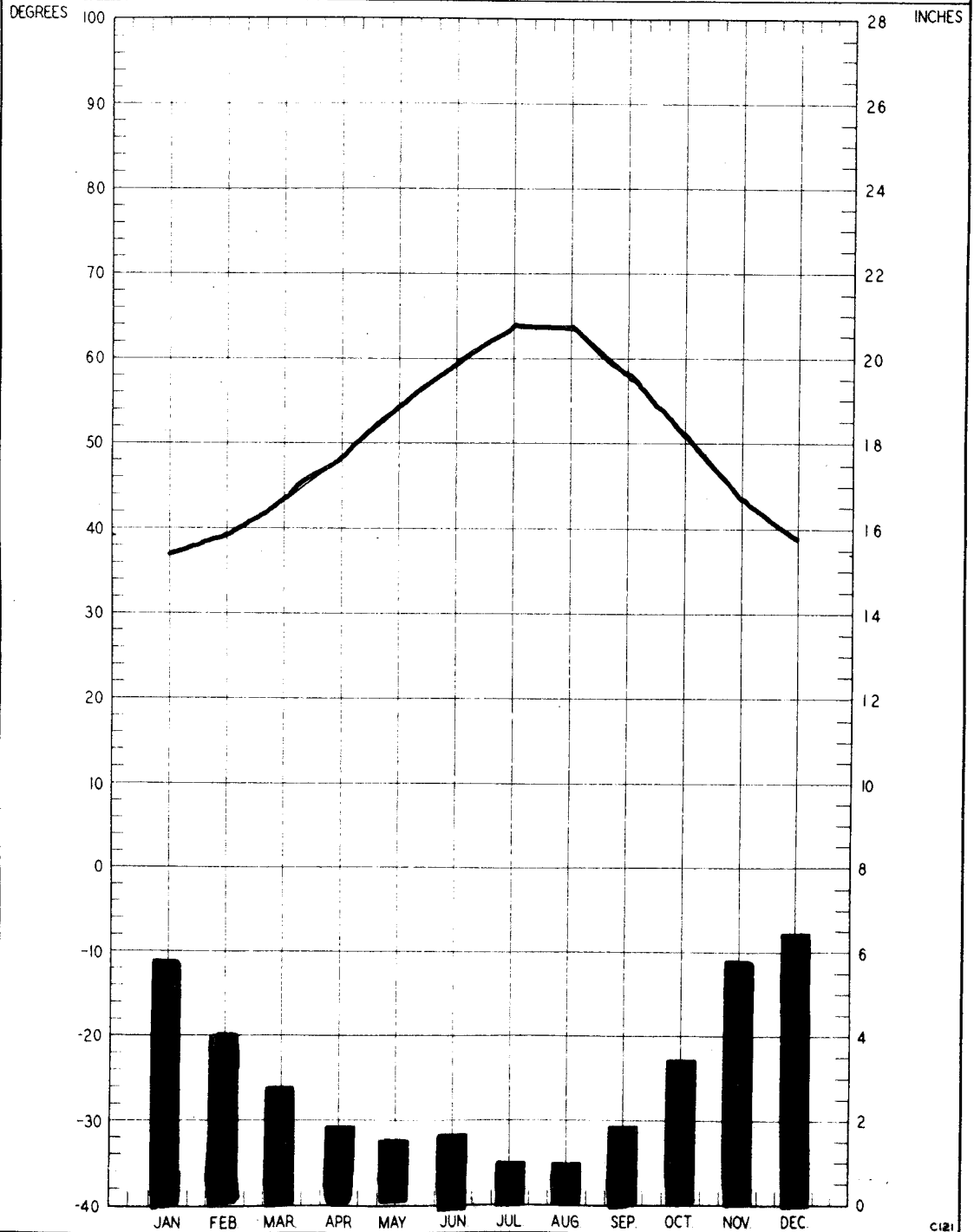


Figure 10.

Departure Bay

From "Climate of British Columbia",
B.C. Dept. of Agriculture, (Report for 1947).

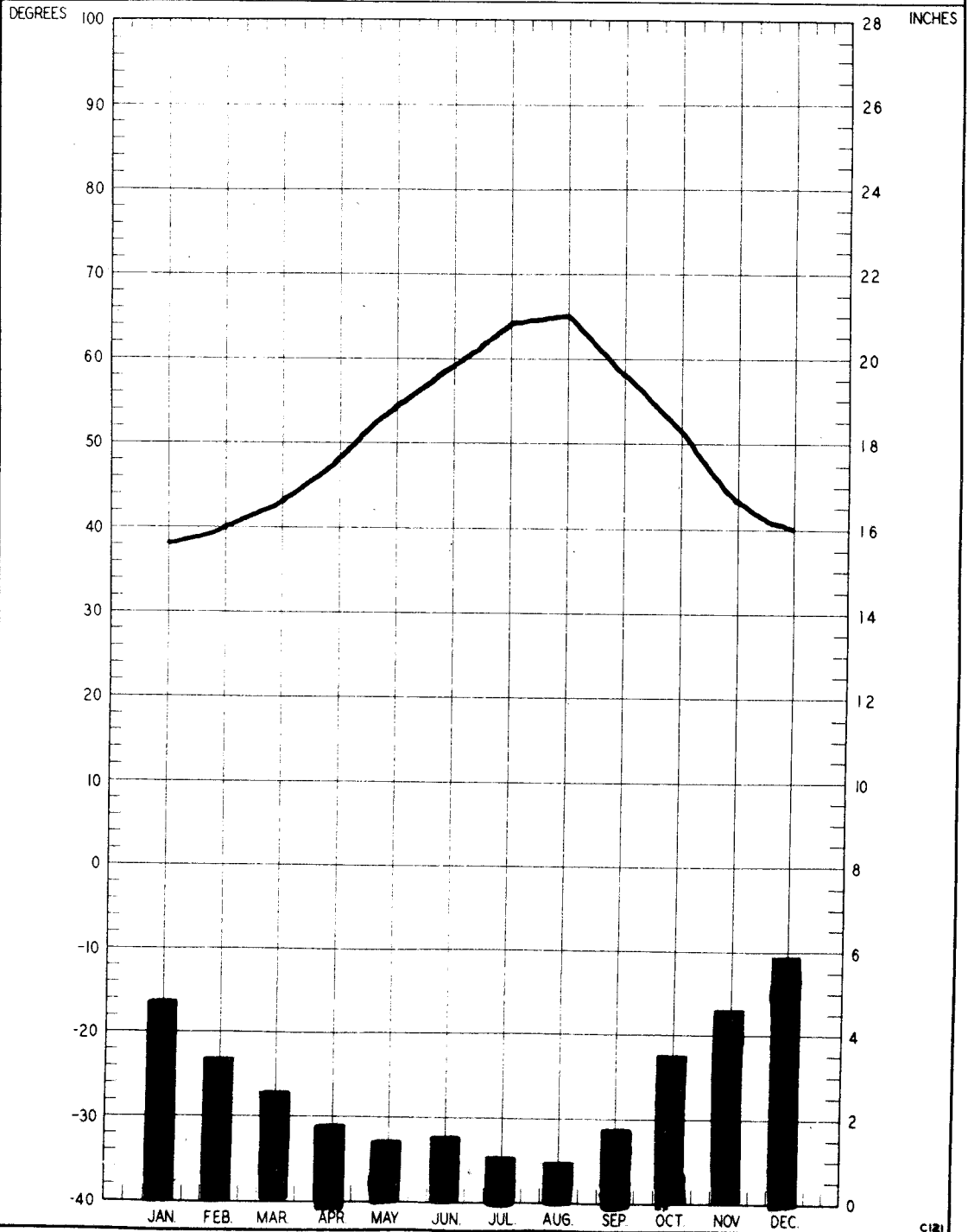
STATION **DEPARTURE BAY**

LATITUDE _____ LONGITUDE _____ ALTITUDE **30'**

MEAN ANNUAL TEMPERATURE **50°F.** MEAN ANNUAL PRECIPITATION **33.22"**

MEAN ANNUAL RANGE OF TEMPERATURE **27°F.**

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C121

probably emerge if recordings were available for points inland from the coast.

C. Frost-Free Period

The moderating influence of the Gulf of Georgia may be seen in the general pattern of the frost-free period for southeastern Vancouver Island. (See Figure 11). Disregarding local factors, topographical or otherwise, it may be said that the more exposed an area is to the open waters of the Gulf, the longer will be its frost-free period.

The most outstanding feature of the pattern of the frost-free period in the Nanaimo area and vicinity is its steep gradient inland. Entrance Island enjoys more frost-free days than any other station recording in British Columbia (298 days), probably due to the extremely small size of the island. Although the effects of local topography upon air drainage must be considered, nevertheless sufficient evidence appears to exist that the western part of the area has its last spring frost two weeks later than the eastern part (see Figure 12), and its fall frost two weeks earlier. (See Figure 13). The frost-free period in the two agricultural districts is about 170 to 190 days.

Mining is perhaps less subject to climatic conditions than is any other primary industry. While the coal-mining industry has been little affected by the climate of the area, the mining population may have been partly attracted

Figure 11.

Frost Free

South-east Vancouver Island

Data from A.J. Connor, et. al.,
The frost free season in British
Columbia, Dept. of Transport.

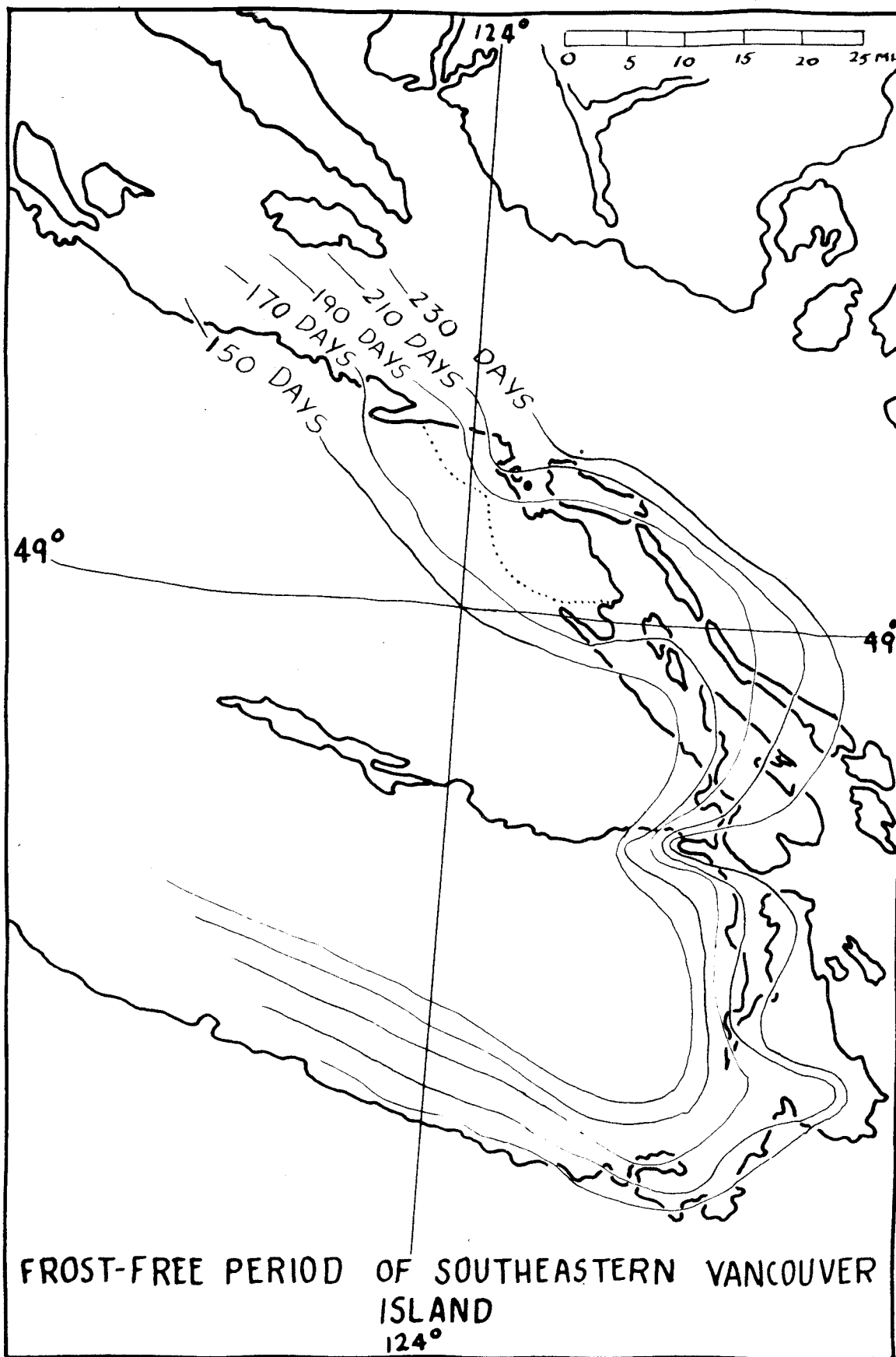


Figure 12.

Date of last Spring frost.

Base map: Southerly portion, Vancouver
Island, B.C. Dept. of Lands, 1938.

Data from "The frost free season in British
Columbia," by A.J. Connor.

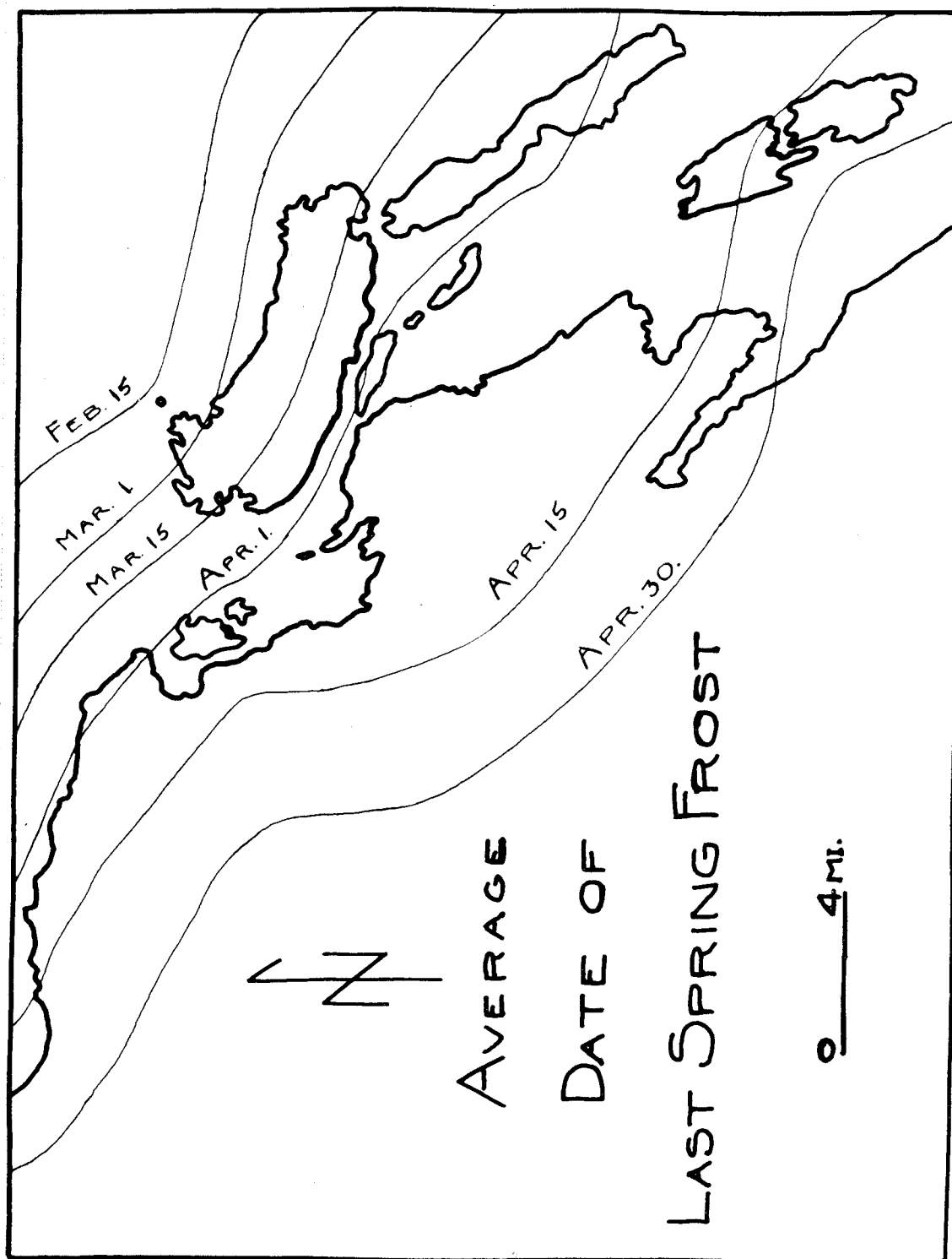
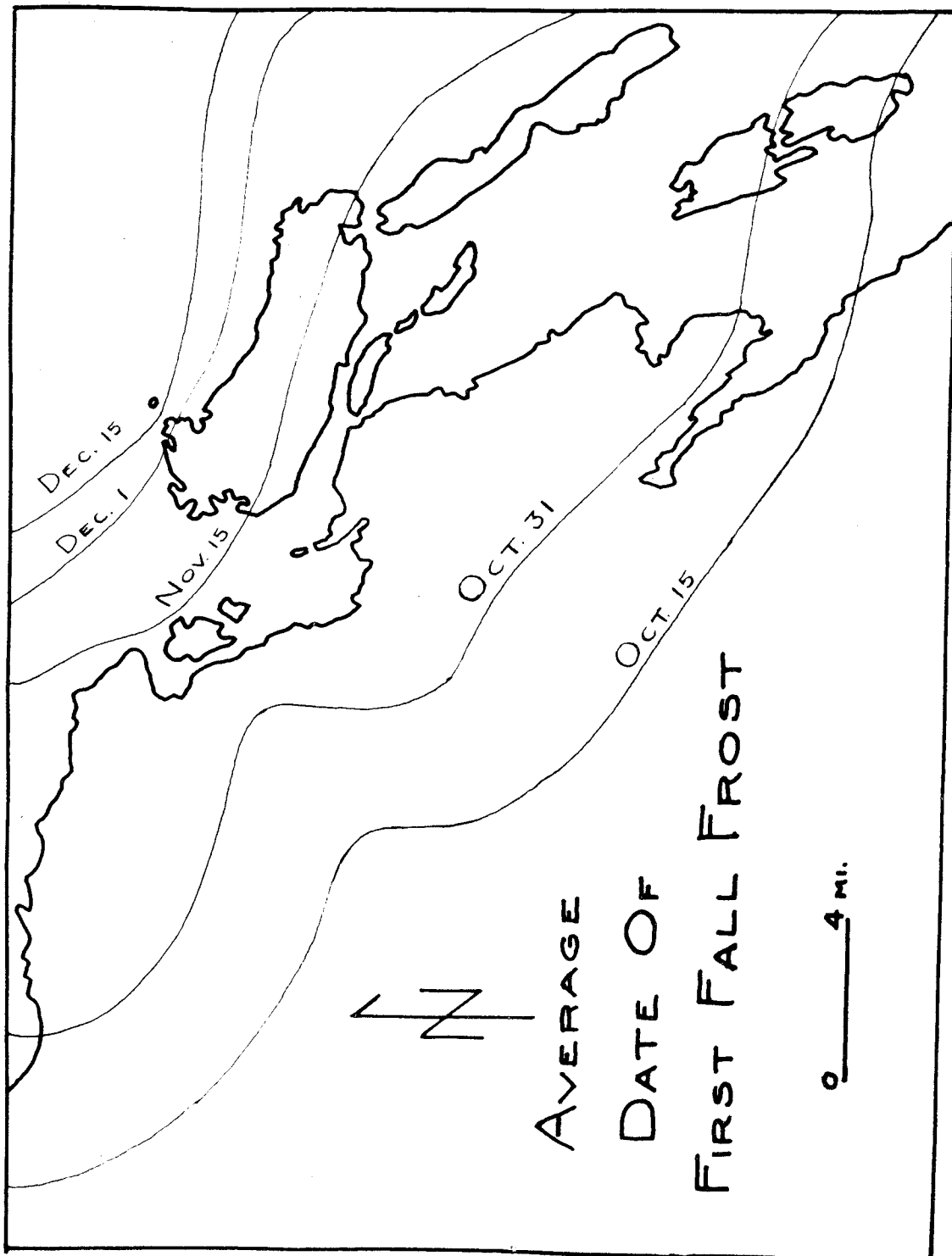


Figure 13.

Date of first Fall frost

Base map: Southerly portion, Vancouver Island,
B.C. Dept. of Lands, 1938.

Data from "The frost free season in British
Columbia," by A.J. Connor.



by the climate.

The increasing precipitation with altitude, and the decreasing length of the frost-free period, among other factors, may have discouraged the spread of settlement to the newer mining areas in the western section. On the other hand, Ladysmith is, in this respect, probably no more attractive as a residential area than is Extension.

Climatic conditions are more important to the distributing economy than they were to the mining economy. The lumbering industry, upon which the present activity is based, has arisen because large coniferous trees grow well in this climate. Logging is, in itself, extremely sensitive to weather conditions. The attractiveness of the coast climate, and of its local variant, is an important factor in the increasing utilization of the Nanaimo area as a residential district.

VI SOILS

The soils of southeastern Vancouver Island are extremely complex in distribution. The original parent materials have imposed some slight differentiation, but the most important factor has been their mode of deposition. Most of the soils of the region are of varied glacial origin: moraines or tills, fluvial, deltaic or lacustrine deposits. Diversity of topography and drainage has produced further local variations. The interaction of soils and vegetation is a continuing cause

of soil diversification.

Within the Nanaimo area, nine soil families and four local variations have been recognized.¹ These have also been classified as non-arable, partly arable (containing some arable areas) and arable.

The resources of arable soil in the Nanaimo area are not only less extensive than in some other districts of central Vancouver Island but, since those available are more closely utilized than in other localities (see Table II) there is little possibility of expanding the local agricultural industry. Only 75 per cent of the Nanaimo area has any soil cover, and of that proportion only one third is arable. The non-productive soils are, however, regarded as excellent forest sites.

The arable soils are most common in the two agricultural districts, with scattered distribution in small valleys throughout the area. (See Figure 14). Arable soil types in the area include the clay and clay loam of glacio-lacustrine origin, fine-textured delta soils, and drained patches of black swamp muck.² Farming has been either a full-time industry tributary to other prevailing industries, or an alternative following upon local exhaustion of coal seams. Many

¹ Spilsbury, R.H., Soil Survey of Vancouver Island, 1944, unpublished.

² *ibid.*, p. 14.

TABLE II
Agricultural Land Use in Upper Vancouver Island

Area	Arable ¹ (acres)	Marginal ¹ (acres)	Non-arable ¹ (acres)	Cultivated ¹ (acres)	Percentage of arable land cultivated
Salmon River Valley	8,000	500	2,000	970	12.1%
Menzies Bay	7,388	2,720	10,533	300	4.0
Courtenay	33,536	26,844	81,451	17,100	50.9
Union Bay - Bowser	1,994	3,495	23,531	1,150	57.6
Qualicum - Parksville	11,210	9,406	45,104	4,700	41.9
Alberni	6,374	10,328	29,187	4,515	70.8
NANAIMO - LADYSMITH	<u>12,293</u>	10,428	46,697	<u>17,155</u>	<u>139.5</u>
Duncan	39,931	4,699	73,033	23,560	59.0
Total	117,726 (120,726 sic)	68,420	314,536 (311,536 sic.)	65,220 (69,450 sic.)	57.5%

1. Spilsbury, R.H., "Land utilization on Vancouver Island," Forestry Chronicle, vol. 19, Sept. 1943, No. 3, p. 166.

Figure 14.

Soil Classification

From Advance Sheet No. 6, Soil Survey
of southeastern Vancouver Island, 1943.

SOIL CLASSIFICATION

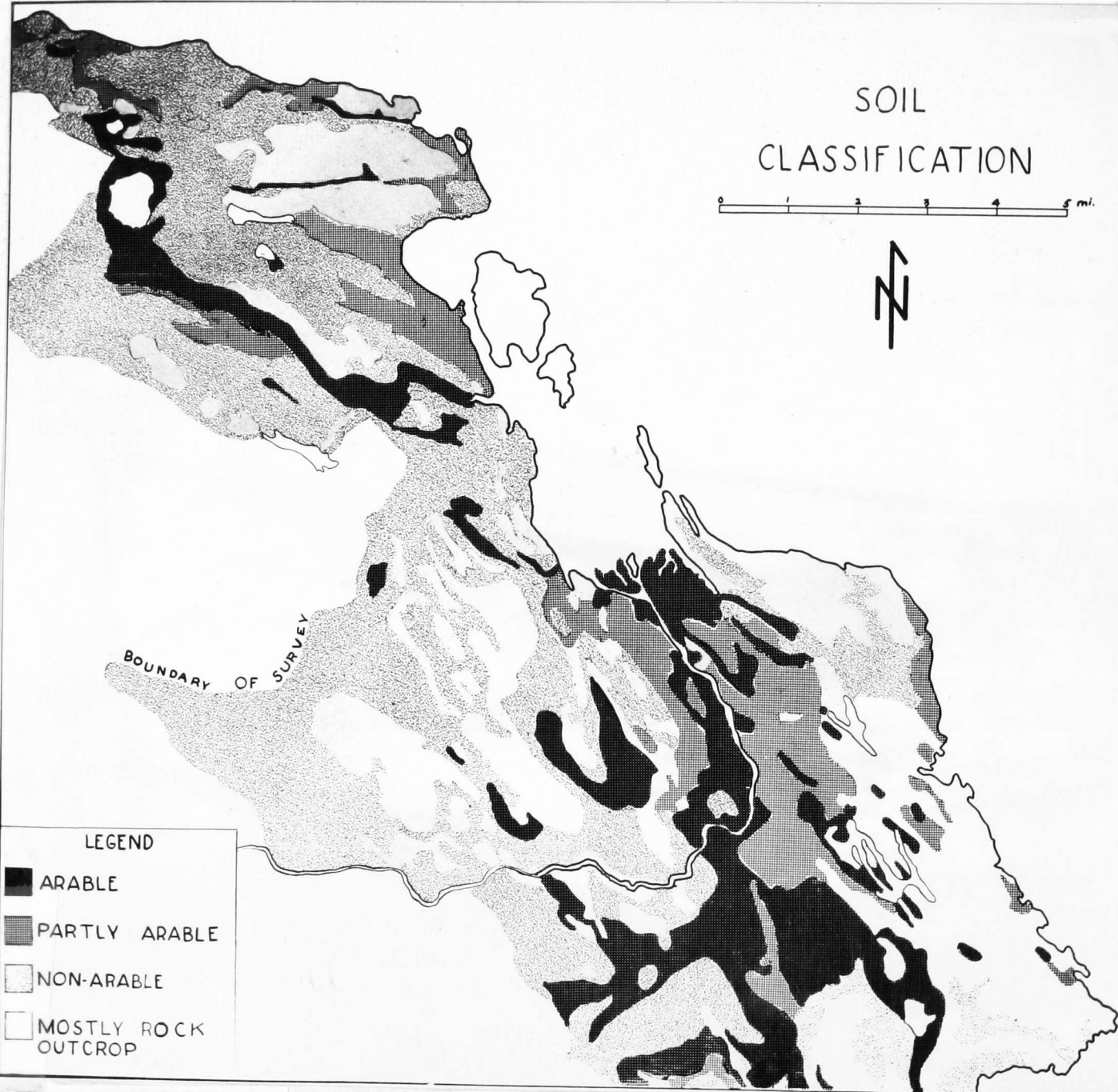
0 1 2 3 4 5 mi.



BOUNDARY OF SURVEY

LEGEND

- ARABLE
- PARTLY ARABLE
- NON-ARABLE
- MOSTLY ROCK OUTCROP



of the scattered arable fractions have been utilized on a part-time basis in conjunction with other occupations.

VII VEGETATION

The natural forest cover of southeast Vancouver Island is chiefly coniferous. Up to about 2000 feet elevation, the dominant species are Douglas fir (pseudotsuga taxifolia) and Western Red Cedar (thuja plicata). Above that, the association is composed chiefly of cedar and Western hemlock (tsuga heterophylla).¹ Red cedar, more tolerant of moisture, predominates in lowland swamps. Halliday further subdivides the forest zone on the basis of distribution of the madrona (arbutus menziesii) and of Garry oak (quercus garryana). These species are found close to the shore-line of the east coast.²

The Nanaimo area has been occupied so long that little of the original cover remains. In logged-over areas, young conifers, red alder (alnus rubra), and broad-leaved maple (acer macrophyllum) are found. In moist areas, the early dominance of the deciduous species gives way less rapidly to that of conifers.³ Among the conifers, hemlock regener-

1 Mulholland, F.D., Forest Resources of British Columbia, 1937, Dept. of Lands, B.C.F.S., pp. 17-19 and Whitford, H.N. and Craig, R.D., Forests of British Columbia, Committee of Conservation, Ottawa, 1918, pp. 57-60.

2 Halliday, W.E.D., A Forest Classification for Canada, Dept. of Mines and Resources, Ottawa, Forest Service Bulletin 89, 1937, p. 26.

3 Spilsbury, op. cit., p. 3.

ates more successfully than does Douglas fir. In addition, the dry summers enable drought-resistant weeds to establish themselves, thus degenerating the vegetation cover.

Early logging in the Nanaimo area did not employ clear-cutting methods, but left non-merchantable trees standing. These acted as sources of seed in regenerating the stands.

Following this clearing, the land was put under cultivation, utilized as rough pasture, or permitted to remain untouched. When World War II increased the demand for lumber, many of these last areas were logged a second time. Only small "outfits" operated within the coastal plain, and once again, clear cutting was not employed. Many of these stands appear to have made a successful beginning of a second regeneration.

The last published survey of the forest resources of the area was made in 1938.¹ The results of the survey, classified by drainage basins, give the area of the resources in acres according to present cover. (See Table III). The high proportion of immature timber in the Millstone and Chase River valleys indicates the extent to which the forest resources of the two basins had been utilized in the years preceding the survey.

The area of the survey embraces the whole Nanaimo basin to the headwaters beyond the area of this study. Furthermore

¹ McMullen, D.L., A Survey of the E. & N. Railway Grant, 1938, Dept. of Lands, B.C.F.S.

TABLE III
Forest Reserves of the Nanaimo Area¹
(in acres)

Drainage Basin	Mature	Immature	Not well stocked	Not suitable for forests	Non-productive	Total
Nanaimo River	102,315	23,145	20,875	5,825	64,315	216,475
Millstone and Chase River	7,375	14,245	9,895	7,395	12,135	51,045
Quennell Lake	1,655	745	2,280	1,080	2,960	8,720
	111,345	38,135	33,050	14,300	79,410	276,240

¹ McMullen, D.L., A survey of the E. & N. Railway grant, Department of Lands, B.C.F.S., 1938, pp. 76, 77, 79.

it was made before the renewed logging activity during and following World War II. Although its findings are not completely applicable to the Nanaimo area, they do indicate serious depletion of a resource from which the Nanaimo area derives direct, and a large indirect, income.

CHAPTER IV

THE COAL-MINING INDUSTRY

The past century has seen the beginning, the rise and swift decline of the coal-mining industry of Nanaimo.

From 1852 until 1948, the Nanaimo field produced about 50 million long tons of coal. During most of that time, the industry employed more people than any other in the area and most of the population received indirect benefit from it. Today the industry is nearing exhaustion of its reserves and while coal-mining still employs the largest single group in the area, only a fraction of the total working population is thus employed. It is probable that mining will never again become predominant in the area, but will continue for a number of years, declining slowly to extinction. The course of the industry can be reviewed now as a process that has reached practical completion, although its secondary effects may continue to be important for some time to come.

I PRODUCTION

For the first eight years of production, 1852 to 1859 inclusive, separate figures for each year are not available. In that time, however, a total of about 27,000 tons was produced, which would average between three and four thousand tons per year. During the last full year of operation preceding the

the sale of the mines by the Hudson's Bay Company, 1860, about 14,000 tons were produced.

Within two years after the mines were sold to the Vancouver Coal Company in 1861, production increased by half, and in 1864 it was double that of 1860. Output continued to increase slowly until 1871, when the Dunsmuir mines at Wellington came into production. In 1874, the new mines began to make a significant contribution to the output, and the early period of mining had come to a close.

After 1874, production increased rapidly. By 1879, over 200,000 tons were being produced in a year. (See Figure 15). A slight decrease in 1882 resulted from a mine fire, a strike and slackness in the coal trade.¹ Although the annual output of the mines nearly doubled in the years 1880 to 1890, market conditions in some years caused fairly serious recessions in the industry.

From 1890 until the end of the century the trend of annual production rose, but at a decreasing rate. In some years, sharp declines in output occurred. While this was due in part to market conditions, it was probably also associated with the approaching exhaustion of the Wellington mines. When these mines closed in 1900, the operations of the Dunsmuir Company were transferred to the Extension mines in the southwestern district of the field.

1 Report of Minister of Mines, 1881.

Figure 15.

Output.

Data from Reports of Minister of Mines

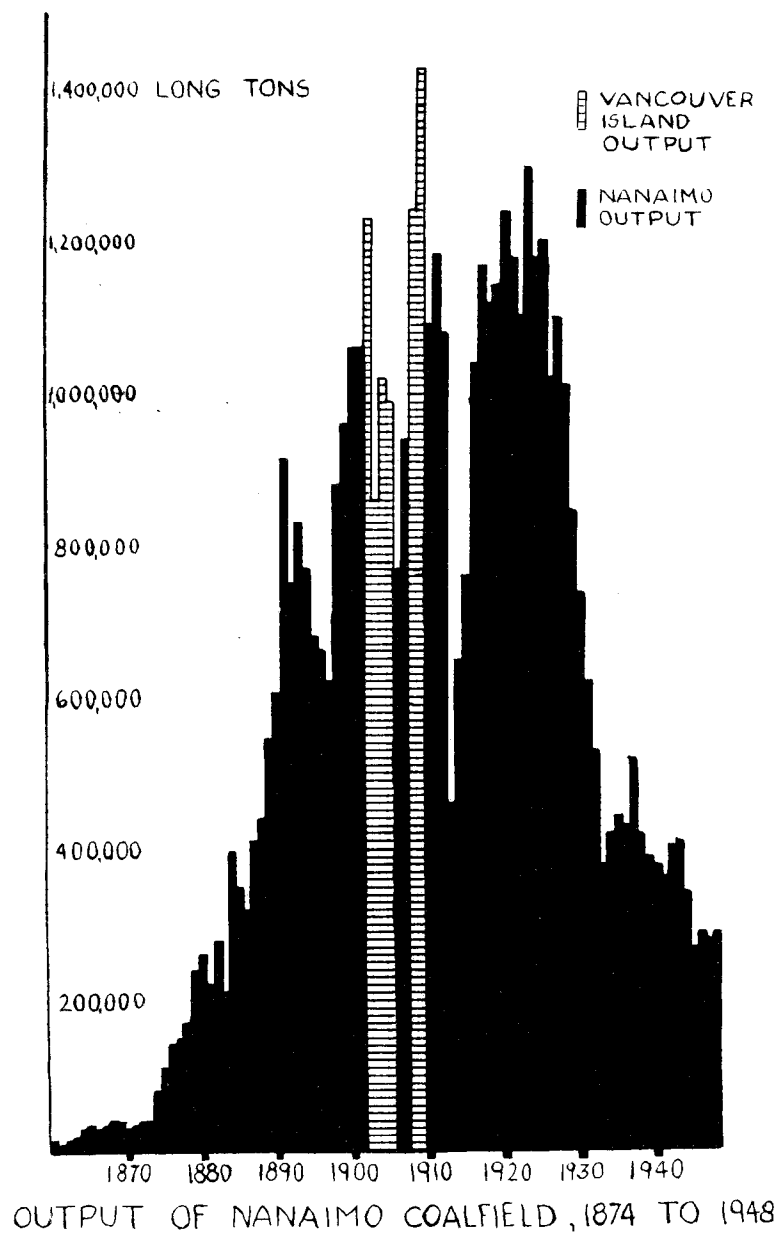


FIG.15

In the years 1900 and 1901, annual production first exceeded one million tons, but this rate was not apparently maintained. From 1902 to 1906, inclusively, returns from some or all of the mines in the Nanaimo field were refused for publication, but some indication of the volume produced can be gained from the returns for the whole Vancouver Island district. Between 1902 and 1906, annual production in Vancouver Island fell as low as 800,000 tons, including the output of the Cumberland field.

From 1906 until 1912, the output was maintained at or above one million tons per annum. In 1913, owing to the strike, it declined below half that amount and the former level was not attained again until 1916.

Although the high production level of the World War I reached its peak in the mines of Washington state in 1918,¹ the high level of production in British Columbia was maintained. In the Nanaimo field 1923 was the peak year.

Market conditions were in part responsible for the decline in demand after 1925, but it was nevertheless the opinion of some that greater production was more seriously hampered by the difficulties of mining and the limited resources of the Nanaimo field.²

1 Dart, John, "The geography of the Roslyn-Cle-Elum Coal Field," unpublished thesis, University of Washington, 1948, p. 14.

2 Campbell, C.M., "Cassidy and the Douglas seam," CIMM, Trans., 1924, p. 483.

The gradual decline which began after 1923 was hastened by the world economic collapse in 1929. Production was already below normal in the early part of the year,¹ and the annual production from the Nanaimo field never again exceeded one million tons.

The rapid decline in production initiated in 1929 was temporarily slowed in 1934 by the re-opening of the Western Fuel Company's Reserve mine. However, by 1939, all mines operated by this company were closed and production was again declining. During World War II some slight improvement followed the development of two new mines in the field, but shortage of labour curtailed production in the latter years of the war.² Since the end of the war annual production has remained between 250,000 and 300,000 tons, about the same as it was during the years 1880 to 1886.

II MARKETS

The marketing of Nanaimo coal has passed through three phases. The first was dominated by the American demand, the second by the increasing importance of the Canadian demand, and the third by the decline of both, due first to the competition of other fuels and later to the exhaustion of the coal reserves.

1 Report of Minister of Mines, 1929.

2 Reports of Minister of Mines, 1942 to 1945.

As has been stated, the coal field was first exploited as a result of the demand for coal in the port of San Francisco. This market continued to absorb an increasing amount until the 1890's. Minor recessions had previously occurred, but those of that period were more serious. The cause of the declining demand was a glut on the San Francisco market due to the competition of Australian and English coal.¹ In the later years of the 1890's, the period of sharp decline in exports to the United States coincided with the increase in annual production of Washington mines from about one million to about two and one-half million tons.² Nevertheless, so dependent was the industry upon the California market that the San Francisco earthquake resulted in the closing of one of the Nanaimo mines for five months.³

A short-lived boom in the metal industry of the United States during 1906 and the first half of 1907, resulted in an increased demand for coal for smelting, but this only served to obscure the seriously increasing competition of fuel-oil. The California market which bought about 900,000 tons of the Vancouver Island output in 1902 (75% of sales), by 1905 took only 400,000 tons (50% of sales). From this period on, the domestic market consumed the greater part of the production of the Nanaimo field. (See Figure 16).

1 Report of Minister of Mines, 1892.

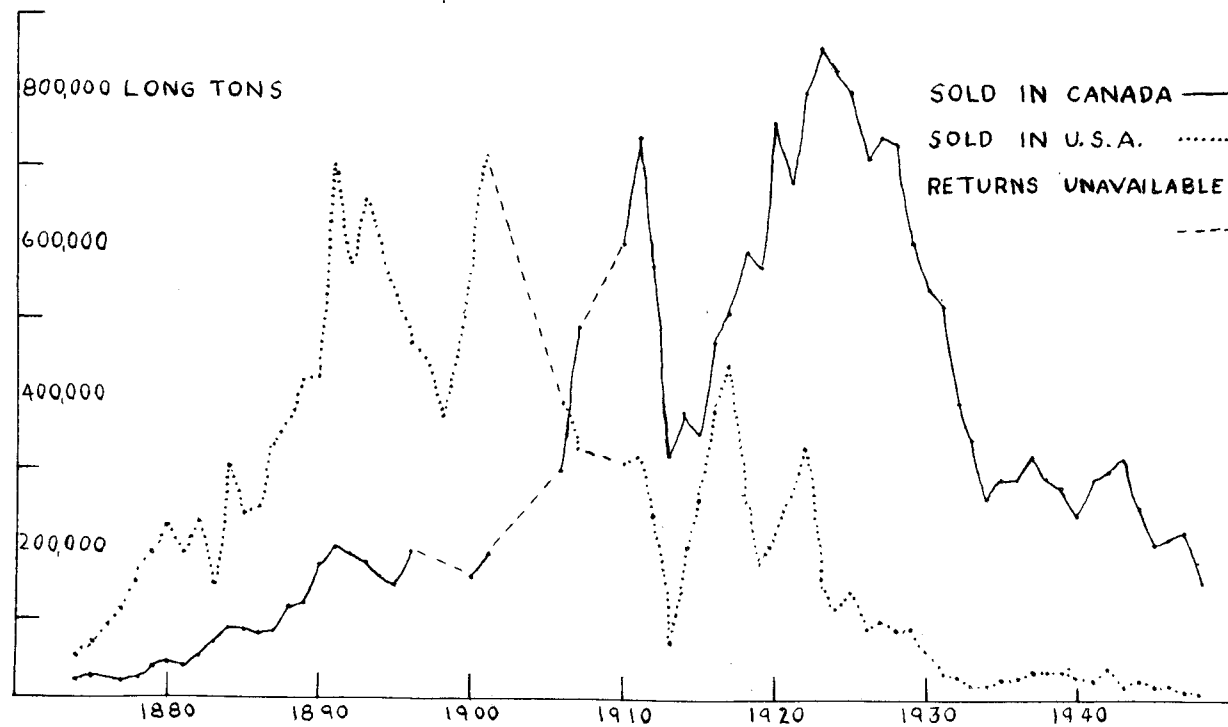
2 Dart, op. cit., graph p. 15.

3 Report of Minister of Mines, 1906

Figure 16.

Sold in Canada and United States

Data from Reports of Minister of Mines



NANAIMO COAL SOLD IN CANADA AND U.S.A., 1874 TO 1948

FIG. 16

Although, in the years 1900 to 1910, petroleum was competing strongly as a fuel in the Pacific Coast market, industry, both in Canada and the United States, was expanding so rapidly that the combined supply of both fuels was absorbed. Prices of Nanaimo coal were high, and it was believed that they would remain high for some time.¹ In 1911, one ton of coal sold for \$4.00 to \$4.75, while four barrels of crude oil, an equivalent amount of fuel, sold for about \$3.00. Although many of the coastal steamships had already converted to oil-burning engines, the increasing coal production was still unable to satisfy the demand for fuel.²

These were the market conditions prevailing when the coal miners' strike occurred in September, 1912.

As the strike dragged on, the available stocks of coal were exhausted and their future replenishment appeared uncertain. This lack caused many consumers to turn to fuel oil. By the end of 1913, the strike being still in progress in some pits, the mines which were operating were able to supply the demand for coal although they were not in full-time operation.³ In 1913, the declining American demand and the increasing domestic demand both dropped sharply.

1 Report of Minister of Mines, 1910

2 Report of Minister of Mines, 1911

3 Report of Minister of Mines, 1913

The stimulation of industrial and shipping activity by World War I helped to hasten recovery from the strike and delayed the effects of the loss of markets to petroleum. The declining trend of the demand for coal returned with the restoration of more normal business conditions. While the demand for coal throughout the province remained high until the depression, the Nanaimo field, in common with other Pacific Coast fields, began to suffer from the competition of cheap and accessible crude oil soon after 1920. During this period, the sales of Nanaimo coal on the American market began the slow, steady decline which has continued without major interruption until the present day.

The growth of British Columbia, and particularly of Vancouver, can be traced in the early trend of the domestic market for Nanaimo coal. The first significant increase in the domestic demand occurred after the completion of the Canadian Pacific Railway to Vancouver in 1886. However, it was not until the first decade of the twentieth century that the real expansion of the Canadian demand took place. Although the domestic market was invaded by fuel oil more slowly than was the American, the same pattern of decline owing to the strike, increase owing to the war and final decline owing to the invasion by fuel oil and to exhaustion of the seams is repeated.

Sales of Nanaimo coal to countries other than Canada and the United States have always been erratic in occurrence and

never large in volume. In those years when such sales were made, they frequently amounted to less than 10,000 tons. Nanaimo coal found its way to widely separated parts of the Pacific basin: Alaska, Russia, Mexico and Hawaii. It was hoped to develop a substantial export to China and Japan,¹ but this never materialized. The sea-board position of the fields which enabled such exports to be made was an advantage also enjoyed by Australian coal.

In addition to the natural difficulties of mining in the Nanaimo field, therefore, the mine operators have had to compete with British, Australian and domestic coal on the American market, and with British and Australian coal in the Pacific market. The Canadian market, like the American, has been strongly invaded by California crude oil and also, in later years, by hydro-electric power.

III MINING METHODS

During the period of operation by the Hudson's Bay Company, coal-mining methods were primitive. The coal was hoisted to the surface on a hand winch operated by Indians.² All the mines were close to the water's edge, so no great outlay was needed to transport the coal, and little was expended upon harbour and shipping facilities. (See Figure 17). In those days, a ship loading coal might be forced to lie in the harbour for three or four weeks.³

1 Report of Minister of Mines, 1886.

2 McKelvie, "The Founding of Nanaimo," p. 179.

3 Mayne, R.C., Four years in British Columbia and Vancouver Island, John Murray, 1862, p. 35.

Figure 17.

Nanaimo, 1862

Sailing ships loading coal at Commercial Inlet. The stockade and watergate surround the Hudson's Bay Company store. The gangway to the pier leads from one of the early mines.

Photo. Provincial Archives.



The increased output produced by the large coal-mining firms in the area was only obtained through the expenditure of large sums of money for underground and surface plants, washing, handling and loading facilities. The Vancouver Coal Company, later the Western Fuel Corporation, established a tipple, washery and wharves at Nanaimo and at Pimbury Point. The Dunsmuir firm first shipped coal from the Wellington mines to Departure Bay, the coal from the later Extension mines being shipped from Ladysmith. Several small firms made use of shipping wharves at Lantzville and other points on Nanoose Bay. The Pacific Coast Coal Mines shipped from its Fiddick Mine at South Wellington and from its Morden mine by way of Boat Harbour. Many railroads were constructed between the mines and shipping points, most of which have now been removed.

The extreme irregularity of the Nanaimo seams imposed restrictions on the methods employed in actual cutting of the coal. Mechanization was rendered impossible in many cases.¹ The general practice in the field was to employ the pillar-and-stall method of cutting in the thick seams, while the thin seams were mined by the longwall method.² The efficiency of

¹ Campbell, C.M., "Cassidy and the Douglas Seam", C.I.M.M. Trans., July, 1924, Vol. 27, p. 482.

² Strachan, "Coal Mining in British Columbia" C.I.M.M. Trans., Vol. 26, 1923, p. 78.

the Vancouver Island employees as measured by average annual production per worker, was never so high as in Washington State or even in the coal mines of the East Kootenay field. This figure varied greatly from year to year with varying local conditions, but the figures for the years 1909 and 1910 nevertheless indicate the trend. The inherent diffi-

Per Capita annual production of
three districts - from Report of
Minister of Mines, 1910.

	<u>1909</u>	<u>1910</u>
Coast	370	382
East Kootenay	380	439
Washington State	560	590

culties of mining the Nanaimo coal did not prevent, and in many cases necessitated, the development by the operators of new methods in coal mining practice. Some of these included new methods in coal-cleaning plants, and the early use of electricity in underground haulage.¹

Some firms operating with lower capital have played a changing part in local coal-mining. When the field as a whole was being explored, some of these small companies did the early developmental work for several mines. When coal was proved to be present in sufficient quantity for large

¹ Gray, F.W., "Coal Mining and Geology in Canada," C.I.M.M., Trans., vol. 51, 1948, p. 65

scale extraction, these companies were frequently bought out by the larger firms which were better able to finance the necessary development. About the time that coal-mining reached its peak, this trend was reversed. In latter years, the small companies obtained the rights to retrieve the coal remaining in the mines when the larger firms abandoned their operations.

IV NUMBERS EMPLOYED

During the years from 1852 until 1922 or 1923, the population of the Nanaimo area was predominantly associated with the mining industry. In consequence, the trend of employment requirements of the industry is reflected in the growth of the whole area, while the annual fluctuations in employment affected its prosperity. The period of steady decline in mining employment marks the time when the area suffered severely from the loss of its main industry, until in recent years, new opportunities have enabled the majority of the people to turn from coal-mining to other forms of employment.

Three distinct phases in the employment requirements of the Nanaimo field are noticeable; the period of fairly steady rapid increase, the period of equally steady and rapid decline, and the intervening years when employment, though generally high, fluctuated greatly from year to year.

By 1874, when annual returns were first published, employment in the Nanaimo field had reached only about 400,

although mining had already been established for twenty-two years. Until 1882, this trend of continuing, but slow, expansion continued. (See Figure 18).

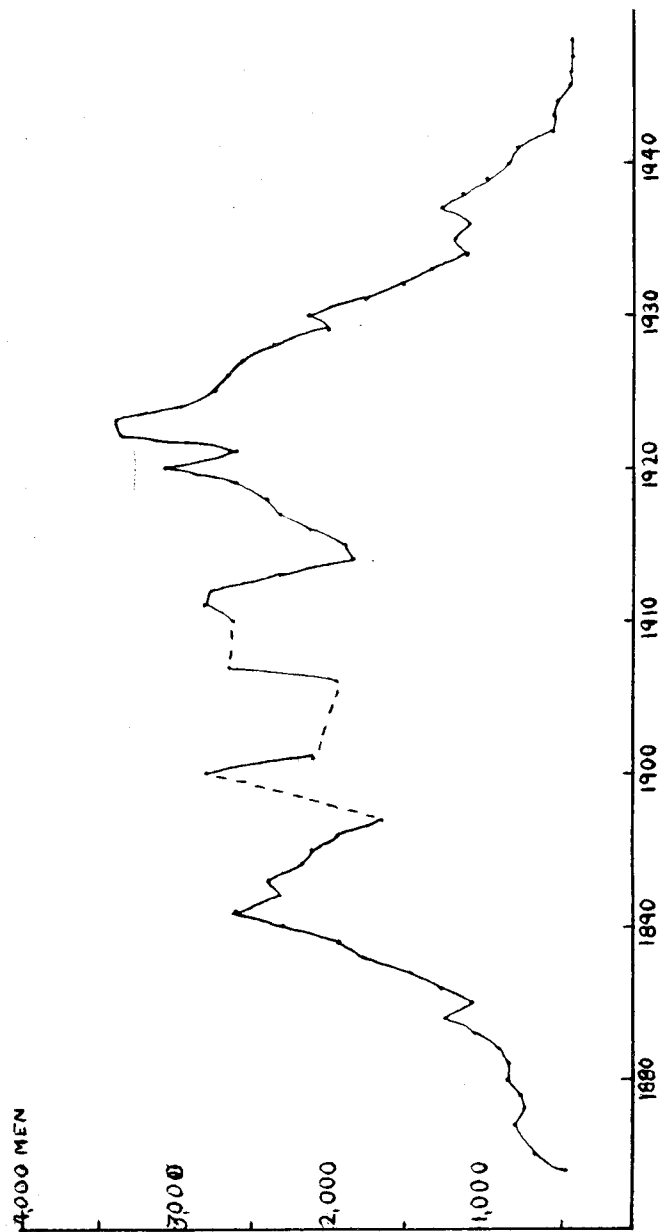
The period of greatest increase in the industry from the point of view of employment as well as of production, occurred in the years 1882 until the early peak year of 1891. The field itself was expanding, markets were expanding, and the competition of other coals and fuels had not reached great proportions. In the opening and development of new mines, increasing numbers of men were employed.

During the period 1891 to 1923, the factor governing mining employment was not so much the operational requirements of the industry as the condition of the market for coal. Periods of slackness in the trade, during which stocks of coal accumulated, initiated periods of decreased employment which lasted until the excess coal on hand was reduced and the market could absorb more than was being produced by the smaller labour force employed. Complete returns are unavailable for many of these years, but the annual variations in numbers employed appears to have been great. For example, employment dropped from about two thousand eight hundred in 1900 to about two thousand one hundred in 1901, or 25 per cent, while it rose from about one thousand nine hundred in 1906 to about two thousand six hundred in 1907, an increase of over 35 per cent. The decrease resulted from a decline

Figure 18.

Employment

Data from Reports of Minister of Mines



EMPLOYMENT IN THE NANAIMO COALFIELD, 1874 TO 1948

FIG. 18

in demand¹ and the increase as a result of the boom in metal smelting previously mentioned. It was in this thirty year period that the competition from other sources of coal, the loss of markets occasioned by the long strike, and the boom years associated with the World War I all affected the market for coal. In turn, the demand for labour fluctuated widely.

The declining period of employment commenced after 1923. When the depression began in 1929, employment in the Nanaimo field had already fallen from 3,400 to 2,000, a decline of about 40 per cent in six years. This drop in employment has continued intermittently until the present day. The decreasing demand for coal has no doubt been an important factor, but the declining productivity of the field has been the fundamental cause of the drop in employment. As the larger mines were exhausted, the mine workers were not absorbed by new mines, although a few were employed by the small firms retrieving coal left in the workings. Many miners and their families left the area altogether, and others eventually obtained employment in other industries.

Only in recent years have records been consistently kept of the number of days each mine was in operation during the year. Thus the employment figures alone do not indicate the proportion of men who worked for part of the year only, or all year on a part-time basis.

1 Report of Minister of Mines, 1902.

V COAL-MINING TODAY

There are today in the Nanaimo area one fairly large mine and a varying number of small mines in operation. The first is operated by the Canadian Collieries (Dunsmuir) Limited, and the others are worked by small groups of private individuals.

The largest mine now working, Number Ten, South Wellington, appears to be fairly prosperous. It employs some 200 men, and produces about 170,000 short tons per annum. MacKay places its probable recoverable reserve at somewhat less than 500,000 tons, so it appears that operations cannot last indefinitely. This mine, recovering coal from the Douglas seam is, however, expected to produce for some years yet.

A smaller mine, White Rapids, closed during the summer of 1950. This mine reached one of the Wellington seams,¹ by means of a slope, but unusual mining conditions prevailed. The floor, usually of East Wellington sandstone, was composed of rock harder than the roof, usually the Extension conglomerate. This hard floor meant that two inches of the already thin seam (30" in thickness) had to be sacrificed in undercutting the measures. The small body of recoverable coal at any one place necessitated the frequent moving of machinery and timbering, so that much of the labour involved

¹ MacKay's table (pp. 102,103) shows, erroneously, White Rapids and another mine (Little Ash) to be operating in the Newcastle seam. This would be an impossibility.

was unproductive of coal. The mine had been operating at a loss for some time previous to its closure.

The South Wellington mine uses rail transportation to move its coal to tide water, as it is adjacent to the main line of the E. & N. railway. Since the mine has tippie and washery facilities at the pit-head, the old buildings on the Nanaimo waterfront have been demolished. Loading facilities are retained; chutes for loading bunkers and a hatch for loading scows. Most of the coal is shipped via Nanaimo, although some goes by rail to other island points.

The closure of White Rapids presents the problem of re-employment of the miners. Many of the men who were employed in the mine are over fifty years of age.¹ Men of this age-group are not easily absorbed into other industries, and the skills which they possess are not readily adaptable to other uses. One outlet for this labour surplus would be in the operation of small-scale mines. Mining skill could be put to direct use, but some capital would be required. However, the labour requirements of these mines are extremely small, and it is unlikely that the group as a whole can be absorbed in this manner.

The combined operations of the small mines form a comparatively insignificant part of mining in the Nanaimo area today. In 1948, eight such mines employed fewer than ten men each, and produced fewer than 3000 tons of coal each during

1 Vancouver Daily Province, May 20, 1950.

the year.

Actual mining is usually done by the operators themselves, often on a cooperative basis, and capital outlay is kept to a minimum. The mines are worked in abandoned slopes, or in areas where remaining coal pillars are sufficiently close to the surface to be reached by the driving of a slope. Mine haulage is done by winches or by draught animals. The coal is transported by truck rather than by rail, while the present workings are so shallow that natural ventilation is sufficient. The reserve of coal accessible to small-scale mining methods is obviously limited and so, in turn, is the possible scope of this phase of coal-mining.

In retrospect, although coal-mining in the Nanaimo field has been the basis for much of the settlement and development in the Nanaimo area, it has had many harmful effects on the area as well. The alternating effects of boom and depression were probably felt most keenly by the mining families. The fluctuation in community purchasing power, however, affected business activity in the district, and all the inhabitants in general. The adverse sociological and material results of the mining industry have, however, been partially offset by other effects which have proved beneficial. Developments during the coal-mining period have, to some extent, assisted the area in its adjustment to its new role as distribution and service centre for upper Vancouver Island.

CHAPTER V

OTHER INDUSTRIES IN THE ECONOMY OF THE NANAIMO AREA

Present and past occupance of the Nanaimo area differs from that of the rest of the coastal plain no more than does the natural environment of the district from that of the region as a whole. The general uniformity of environment throughout the region has given rise to a general similarity of occupance. Varying emphasis on certain phases of the occupance from section to section has developed through the adaptation of the inhabitants to minor variations in the natural environment. In the Nanaimo area, primary industry is now of less importance than in the region as a whole, due to the limitations imposed by environmental factors. The factor of location, however, has enabled the inhabitants of the district to place a greater emphasis on tertiary industry.

The present structure of the local economy has evolved from a changing relationship to the coal-mining industry.

Many activities were initially stimulated to supply the needs of the mining industry and the mining population, and supplying the needs of this industry still constitutes a minor part of the function of some industries. Certain of the primary industries were developed to supplement the activities of the mining population. These activities are still pursued by

some miners, but they are now chiefly carried on in conjunction with other types of employment. As the coal resources were depleted, other forms of activity succeeded mining as the chief occupation. These succeeding industries vary in character throughout the various localities in the area, depending upon local factors of environment and economic opportunity.

I PRIMARY INDUSTRIES

A. Agriculture

In common with the other primary industries, the scope of agriculture in the Nanaimo area is naturally limited. The terrain is rough, with prevalent rock outcrops and many steep slopes. Deposits of sand and gravel, laid down in ground moraines or on the Pleistocene delta, are more extensive than are the fertile alluvial silts. Excessively drained slopes alternate with poorly drained swamps. All these factors prohibit agriculture from attaining much relative or actual importance in the area.

Owing to the isolated location of the original settlement, most of the food supply for the pioneer community had to be obtained in the vicinity.¹ There was thus created at an early date a demand for produce from local farms.² By 1876

1 McKelvie, "The founding of Nanaimo," p. 187.

2 Pearse, B.W., General report on the country round Nanaimo, Copy of report made to William A.G. Young, acting Colonial Secretary, Victoria, 30 May, 1860.

there were farmers established in Cedar, Cranberry, Wellington and other districts, as well as on Gabriola Island and at Nanoose Bay. The coal companies themselves operated farms to provide feed for the draught animals used in haulage.¹ The main market for local produce has always been that of the surrounding population, although the immediate sources declined in importance as suppliers of that market. The rapid population increase of the 1880's made necessary the importation of food-supplies from outside points which now constitutes the major source of food-stuffs for the area.

While full-time farming was still functioning as a contributory industry to coal-mining, a new phase of farming activity was developed in the area. The exigencies of mining resulted in varying periods of slack employment or unemployment and many miners found it necessary to turn to part-time farming to supplement their incomes and food supplies. In addition, the Vancouver Coal Company made it a policy to establish many of its employees on five acres farms immediately west of the town. This policy achieved its desired end of stabilizing the mining population and further strengthened the tendency toward a phase of agricultural activity which is common throughout the coastal plain region. This supplementary

1 B.C. Directory, 1882-83, p. 176 (publishers R.T. Williams.)

function of agriculture, established during the coal-mining period is still important in the Nanaimo area.

Wherever soil and topographic conditions were favourable, full-time commercial farming became locally important following the exhaustion of the coal seams. This change has been most noticeable at Wellington and East Wellington, and is taking place to a somewhat lesser extent at Cassidy and Extension.

Cedar is the only community where full-time farming has been a major activity throughout the whole period of its development.

The agricultural industry of today operates under many economic disadvantages. As early as 1862 it was remarked that the drainage necessary for operation of some bottom lands was not feasible owing to the cost of labour.¹ The demands of the mining industry and of succeeding industries for unskilled labour have almost always constituted serious competition to agriculture in this respect. In addition, land costs are high, owing both to population pressure and to the scarcity of good soil. Nearly all agricultural equipment and supplies are imported from the mainland, so that their cost is greater than in such areas as the Fraser Valley. Throughout Vancouver Island, capital outlay in

¹ Rattray, Alexander, Vancouver Island and British Columbia, London, Smith, Elder Co., 1862, p. 60

farming is high, while returns are comparatively low.¹ Since rail freight rates are now calculated from Nanaimo as a distributing point, however, agriculture in the immediate vicinity of the city may enjoy a slight economic advantage over that in other localities.

In common with all farming districts on the British Columbia coast, the mainstay of local agriculture is the production of hay, oats and pasture in conjunction with livestock, particularly dairy cattle. This is the type of farming activity which predominates in the coastal regions of both British Columbia and the Pacific Northwest States.²

Fertile flat lands are utilized for improved pastures or for grain hay and the less valuable soils are usually left for unimproved rough pasture. The agricultural land use pattern of the Millstone Valley typifies the general development of the area. (See Figure 19). Upon the soils of deltaic origin in the narrow flood plain are found fields of hay and oats and pastures for dairy herds. The partially arable soils on the slopes southwest of the river are used for rough pasture. (See Page 101). The confinement of farming activity on the left bank by the persistent cuesta formation is a common phenomena, throughout the area as a whole.

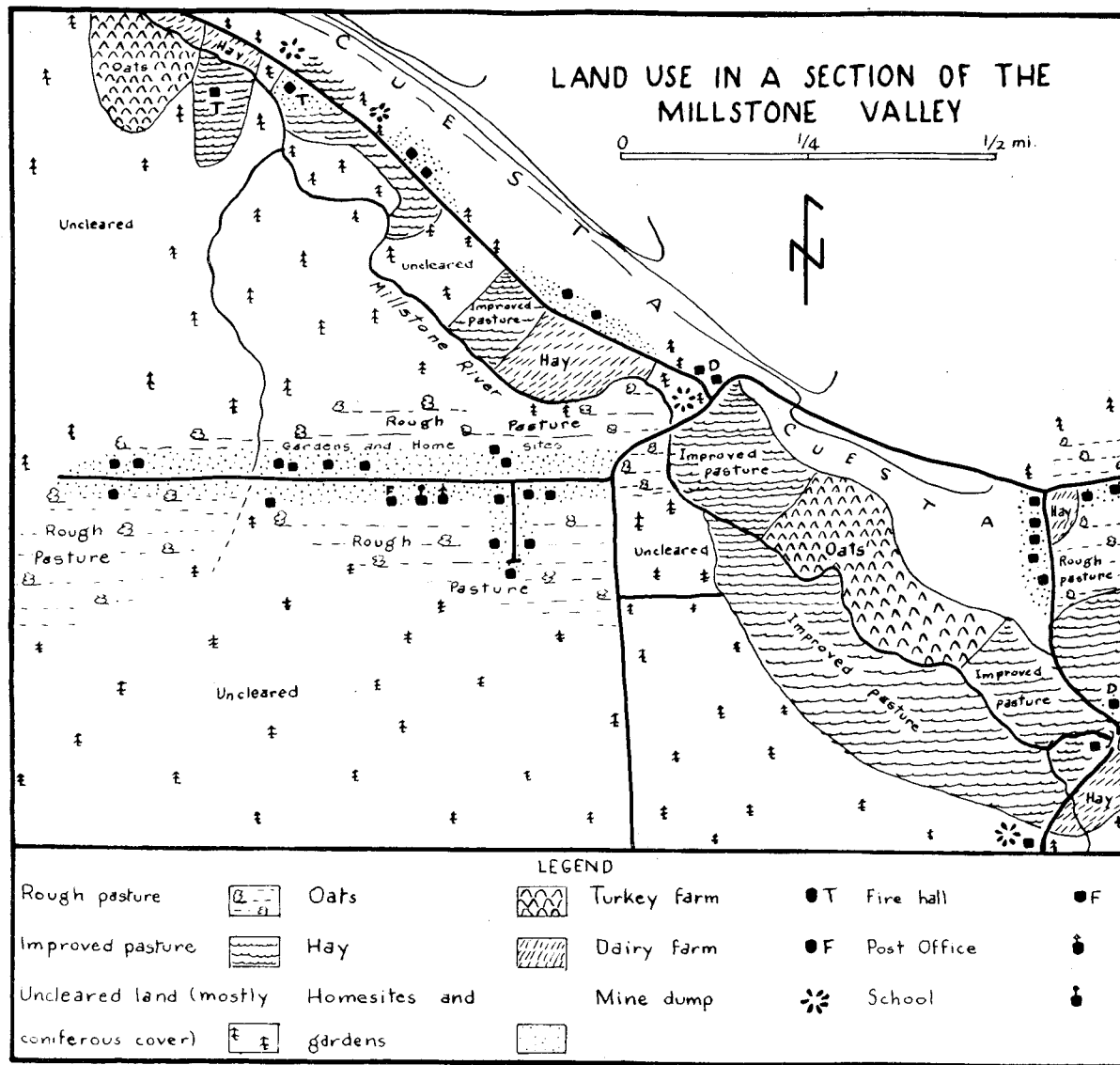
1 Pope, W.H., Inspector, Poultry Branch, British Columbia Dept. of Agriculture, interview with the writer, August 8, 1949.

2 Baker, Oliver E., "Agricultural regions, part IX, the North Pacific hay and pasture region," Economic Geography, vol. 7., 1931, p. 129.

Figure 19.

Land Use in the Millstone Valley

Base map: Nanaimo sheet, Dept. of
National Defence, 1941.



See Appendix B

Although Nanaimo lies well within the milk-shed of the city of Victoria,¹ the fluid milk produced in the area is consumed locally. The area is, in fact, forced to import milk from the mainland. Other livestock products of the Nanaimo area include veal and some beef, and a few sheep, both for mutton and a little wool. A few hogs are reared, usually for private use.

In conjunction with the hay and pasture complex, certain specialties are produced as cash crops. Pockets of fertile bottom land are utilized to grow potatoes both for seed and for the local market. Other vegetables are produced, but their annual quantity fluctuates greatly according to the prevailing prices and the inclination of the growers. (See Table IV). A late spring also curtails vegetable and potato production, since the swamp muck does not dry out in time to permit early crops to mature.

Small fruits are not of great importance. Gentle slopes are occasionally utilized for growing strawberries for the local market. Less perishable fruits, however, cannot compete with those from areas having economic or climatic advantages for fruit growing. Steep southward-facing slopes of glacial till are utilized for the single commercial vineyard.² The well-drained light soil warms

¹ Van Horne, H.B. and Maxwell, J.C., Agriculture in Central Vancouver Island, 1946, Canada, Dept. of Agriculture 1949, p. 10.

² Girard, E.L., interview with the writer, Oct. 3, 1949.

TABLE IV
SALES OF LOCALLY GROWN VEGETABLES
IN NANAIMO AND BRITISH COLUMBIA,
1945 to 1948
(in Tons)

	1945	1946	1947	1948
<u>Potatoes</u>				
Nanaimo ¹	250	440	871	261
Province ²	81,700	120,650	106,900	111,350
<u>Other Roots</u>				
Nanaimo ¹	17	2	38	6
Province ²	19,550	19,950	19,550	18,374

1. Figures supplied to writer by B.C. Coast Vegetable Marketing Board.

2. From Agricultural Statistics Report, British Columbia Department of Agriculture, 1948.

early in spring and holds its warmth overnight. Maximum sunshine and air drainage are obtained, and minimum summer temperatures permit continuous growth. Early fall frosts may kill the leaves of the vines, but the high sugar content of the grapes themselves prevents damage to the fruit. The grapes (hybrid varieties of the *Vinifera* and *Labrusce* types) are sold in Vancouver for table purposes or as grape-juice which is made on the premises. Further expansion of this activity would be limited by marketing conditions and by the scarcity of steep till slopes.

Poultry, particularly turkeys, is also a specialty product of the Nanaimo area. The local area is well suited to the production of good grass suitable for ranging turkeys while the dry summers and well-drained slopes permit healthy growth of the birds.¹ Owing to the mild winter temperatures the birds commence laying in January, and eggs are shipped to the prairie provinces for early hatching.² This industry has been stimulated by the restriction on importation of American poults and eggs in an effort to conserve exchange and in an unsuccessful attempt to prevent the entry of Newcastle disease. An annual supply of about one-half million eggs and poults from the United States into western Canada having been removed, Vancouver Island breeders have seized upon the

1 Pope, W.H., interview, 1949.

2 Savage, A. Buckerfields Ltd., interview with the writer, July 21, 1949.

opportunity afforded them. Local breeding stock is acquiring a reputation for homogeneity and quality. Although the meat-producing aspect of the industry may not survive the lifting of import restrictions, it is believed that the demand for hatching eggs and breeding stock will remain steady.¹ A local epidemic of Newcastle disease may restrict this branch of the industry.

Two trends in agricultural practice are evident in the Nanaimo area: partial specialization for the production of cash crops, and the pursuit of part-time farming in such a manner as to amount to virtual abandonment of the land. Both are phases of adaptation to the economic disadvantages of farming. While some farmers find it necessary to produce a high value crop, others turn their main attentions to other occupations, utilizing their land, perhaps, only for the grazing of a cow to supply family requirements. Both trends are found throughout the greater region and the urban population and industries now predominating in the Nanaimo area particularly encourage their local development.

B. Logging

With proper management methods, the prevalent forest soils of the Nanaimo area could be considered an asset. The area has been logged over in the course of its history, but in spite of some sections having suffered degradation of the

1 Pope, W.H., interview, 1949.

vegetation cover, a fairly large area has been left which is again growing a merchantable crop of timber.

Utilization of the forest resources for buildings and for mine timbering commenced immediately upon the establishment of coal-mining in the area.¹

During the coal-mining period the output was almost entirely consumed locally. However, when the best of the timber which was accessible to early logging operations had been consumed, supplies for milling purposes were obtained in the fine stands of the Sayward district² and in Jervis Inlet.³ Local utilization of the forest resources was continued, nevertheless, until the virgin stands in the area had completely disappeared. Logging was thus an important contributory industry to coal-mining. Pit props and constructional lumber for present coal-mining are supplied locally.

Dependent as it was upon the local market, logging never formed an important supplementary source of income to mining, since periods of slackness in the coal industry would coincide with similar conditions in the market for lumber and pit props.

1 1 McKelvie, op. cit., p. 182.

2 Timber Inspector's Report, in Report of Commissioner of Lands and Works, B.C. 1898.

3 Cowie, John, interview with the writer, June 9, 1950.

Accessibility to larger continuous stands of lumber has determined the importance of logging as a succeeding industry to mining. Logging is thus a major activity in the peripheral localities only, such as Lantzville, Cassidy and Extension.

Present logging operations in the Nanaimo area differ from those on Vancouver Island as a whole with regard to the size of the concerns. Approximately seventy blocks of land are leased to small firms utilizing the scattered stands which are in existence. The logs are sold on the open market, or by contract to the local mills. Railroad ties, telephone poles and pit props are also produced. Present activity in this industry is due to the unprecedented demand for lumber, since utilization of the second growth is now economically possible. Seventy-five per cent of the cut in the Nanaimo area is third grade Douglas Fir, the remainder being of Western Hemlock.¹ The future of this industry in the area is dependent upon world market conditions for lumber. At present, the local industry appears to be in a fairly good position.

C. Fishing

Owing to the lack of large salmon rivers on Vancouver Island, commercial salmon fishing in the immediate coastal

¹ Scaling and Royalty Reports, 1948, B.C. Forest Service, Nanaimo Office.

vicinity has never been so important as along the mainland coast, and the industry has brought little direct benefit to the Nanaimo area.

The Directory for 1893 lists seven men as fishermen, all resident at Departure Bay. The 1948 Directory lists eight living in various parts of the district. These figures, typical of most years, indicate the scope of the industry as an occupation.

While the salmon fishery in this vicinity is of secondary importance, the resources of herring are of considerable value. Schools of herring appear off-shore during the autumn months, and extremely good catches have been made in the waters near the town. In some years the quota of herring for the Lower East Coast of Vancouver Island Sub-district (40,000 tons per annum¹) has been obtained in a few weeks.

Nanaimo is the administrative centre for a fishing district extending from French Creek in the north to Shoal Harbour, near Sidney, in the south. Throughout that district, the relative importance of the herring catch prevails. (See Table V).

There are three buying stations, branches of larger firms, located on the Nanaimo waterfront. The greater proportion of the local catch is never landed there, however,

¹ Dominion Department of Fisheries, Special Fishery Regulations for the Province of British Columbia, 1949, p. 13.

TABLE V

 LANDINGS IN THE NANAIMO
 FISHING AREA, 1949.¹

Salmon	21,305	cwts.
Herring	807,279	"
Cod	4,800	"
Soles	177	"
Perch	59	"
Octopus	22	"
Clams	3,500	"
Crabs	6	"
Shrimps	137	"
Oysters (shucked)	15,000	gallons

1. Data supplied by Nanaimo office, Dominion Dept. of Fisheries.

but is shipped to plants at Vancouver or on the Fraser River; the salmon for canning, the herring for reduction into meal or oil.

The real importance of Nanaimo to the fishing industry is in the servicing, repairing, and supplying of fishing vessels.

The number and value of these vessels licensed to fish in the Nanaimo sub-district, and the value of the fishing gear employed, indicates the true importance of fishing to the Nanaimo area today. (See Table VI).

The Biological Station of the Federal Department of Fisheries, located at Departure Bay, provides further indirect benefit from the fishing industry to the economy of the area. In 1948 this institution had one of the largest single payrolls in the Nanaimo district.¹

D. Mining (other than coal-mining)

This primary industry, confined entirely to non-metallics is least important of all. Small quantities of so-called "fire-clay" were at times mined with the coal. Local sandstones have been quarried for building purposes and for pulp-mill grindstones. While local shale is at present used in a brick-plant on Gabriola island, none of these other products is at present utilized. Sand and gravel are taken from glacial deposits and from the bed of the Nanaimo River

¹ Regional Industrial Index of British Columbia
Regional Development Division, Department of Trade and Industry,
British Columbia, 1949 edition.

TABLE VI

VALUE OF VESSELS AND THEIR GEAR
 LICENSED TO FISH IN THE NANAIMO
 FISHING AREA, 1949.¹

Type	No.	Value
groundfish draggers	22	\$ 340,000
herring seiners	49	2,549,000
salmon seiners	48	882,000
salmon trollers	406	730,800
codfish boats	80	160,000
grayfish boats	95	190,000
crab boats	1	1,200
Value of fishing gear used		<u>1,080,450</u>
Total value		\$ 5,933,450

1. Data supplied by Nanaimo office, Dominion Department of Fisheries.

for use in road building and general construction.

II SECONDARY INDUSTRIES

Like the primary industries, the secondary industries have played a varying part in the Nanaimo economy, dominated as it was by coal-mining. Two distinct types of demand were created by the mining industry; that arising from the needs of the industry itself, and that arising from the requirements of the mining population. Although some of the industries stimulated by such demands were of a temporary nature, others have survived the decline of the industry which led to their initial development and have expanded to supply new and wider markets. This expansion and diversification is the real basis of the community's changing function, since few entirely new industries have been located within the area following the decline of coal-mining. This statement applies, perhaps, even more accurately to the tertiary industries than to the secondary, because manufacturing in the Nanaimo area still does not employ many people.

Most cities support the manufacture of certain items which are either highly perishable or which have a purely local value. During the nineteenth century, many more goods were considered perishable than today. Owing to advances in shipping methods and to the increasing dominance of Vancouver many of these items, previously manufactured locally, are now wholly or partially imported. The city still supports bakeries,

ice-cream plants, soft-drink plants and small scale candy manufacturing. Nevertheless, competing products are now imported in great quantities. Butter, cheese, tobacco products and beer, formerly manufactured locally, are now imported.

Those industries which catered to specialized requirements of the coal-mining industry and its employees have generally disappeared. A tannery and shoe factory formerly supplied the local demand for heavy footwear. For many years a powder plant located near Departure Bay produced blasting powder for mining operations. Both have disappeared with the decline in coal-mining.

Because coal-mining produced both the fuel supply and the demand for electrical energy, a power plant was located on the banks of the Millstone River at least as early as 1892.¹ This plant, near the site of the old Hudson's Bay water wheel, produced electricity from steam with a hydro-electric auxiliary plant.² Later, power was generated from the water-supply in Westwood Lake at a plant farther up the valley. Modern hydro-electric developments caused the discontinuance of local power generation. The area is now supplied with electrical energy from the John Hart project administered by the B.C. Power Commission.

1 B. C. Directory, 1892, p. 322.

2 Cowie, John, interview with the writer, June 9, 1950

Manufacturing which supplied the general requirements of both mining industry and population has survived the decline in coal production but it is still modest in scope, although it may find in the evolving economy an opportunity for steady, if small scale, development.

From the point of view of employment, the most important secondary industry in the area is, at present, sawmilling. This industry also owes its initial development to the stimulus of coal-mining, but its present expansion is due to other factors.

The sawmill established at Nanaimo by the Hudson's Bay Company in 1853 was one of six operating on Vancouver Island in 1866. Its daily capacity was then 15,000 board feet.¹ By 1882, a mill was operated in Nanaimo as well as one at Wellington to supply the colliery at the latter point.² In 1886, the Nanaimo mill changed hands,³ and, under its new owners, its daily capacity was expanded to 70,000 board feet,⁴ and included a planing mill and a sash and door factory. In the latter years of the nineteenth century this mill was one of the largest in operation in the province. By 1895 a second sawmill was in operation at Nanaimo,⁵ and the number was in-

1 Lamb, W. Kaye, "Early lumbering on Vancouver Island," reprinted from B.C. Historical Quarterly, April, 1938, p.112-116.

2 B.C. Directory, 1882-83, p. 156.

3 Nanaimo Free Press, 50th Anniversary number, April 15, 1924, p.2. (Item dated Feb. 20, 1886.)

4 Report of Timber Commissioner, 1888.

5 B.C. Directory, 1895.

creased by several in various parts of the Nanaimo area during the succeeding years. Throughout all this time, the milling industry functioned to supply the demands of coal-mining and its dependent population.

Sawmilling was largely dependent upon mining, and the number of mills appears to have declined with the decrease in the major industry. In 1936 there was only one sawmill operating in the Nanaimo area.¹ In 1941, there was still only one mill in the Nanaimo area producing over one million board feet of lumber per annum.²

The resurgence of milling activity during the war and post-war years has been general throughout British Columbia. The revival of this industry in the Nanaimo area is a local phase of this development, but has also been stimulated by the presence of suitable wharf facilities for loading lumber on the Nanaimo waterfront.

None of the mills at present in operation cuts more than five million board feet of lumber per annum. (See Table VII). The smaller mills in the area usually obtain their logs by contract with the operators of small leased areas in the vicinity. Several of the larger mills obtain their logs by purchase on the open market. The main product is lumber, but railroad ties, hog fuel, sawdust and some pulpwood are also sold.

¹ McMullen, Survey of the E.&N. Land Grant, B.C.F.S., 1936.

² Dept. of Mines and Resources, Sawmills of Western Canada, map, 1941.

TABLE VII
SAWMILLS OF THE NANAIMO AREA ¹

Size of cut	Type of mill	Power equipment	Type sawn	Sources of logs
Less than 100,00 bd.ft. per annum				
1.	portable	diesel, gas engine(s)	Douglas fir	purchase and contract.
2.	"	gas engine(s)	"	from own and leased limits
3.	"	"	"	purch. & contract
100,000 to 199,000 bd. ft. per annum				
1.	portable	diesel engine(s)	alder, maple, D.fir	purchase
2.	"	gas engine(s)	D. fir, hemlock, cedar	purch. & contract
3.	"	"	maple, D.fir, alder, cedar	(purchase and
4.	"	"	Douglas fir	(leased limits
200,000 to 499,000 bd. ft. per annum				
1.	"	"	D. fir, alder	purchase
2.	"	"	hemlock	from own or leased limits
500,000 to 999,000 bd. ft. per annum				
1.	stationary	"	D. fir, hemlock, cedar, spruce, Western yellow pine	purchase
1,000,000 to 4,999,000 bd. ft. per annum.				
1.	"	steam, electric motors	D. fir, hemlock, cedar, spruce	purchase
"	2.	"	electric motors	D. fir, hemlock, spruce
"	3.	"	"	D.fir, hemlock, cedar, white pine
				purch. and from leased limits

1. Compiled from List of Canadian Sawmills, Canada, Dept. of Trade and Commerce, Dominion Bureau of Statistics, Census of Industry, Forest Products Statistics, 1948. (from operations for the calendar year, 1946.)

The small scale of milling operations is commensurate with the magnitude of the forest resources of the area. An increase in purchase of logs from outside points could enable the larger waterfront mills to expand their production.

Much of the lumber produced locally is consumed locally, but an excess now reaches the world lumber markets. The figures for annual shipments via the Assembly Wharf include quantities from mills beyond the Nanaimo area, and reflect the importance of Nanaimo as a shipping rather than as a milling centre. (See Table VIII).

The manufacturing of wood pulp is a new forest products industry in the Nanaimo area. A mill has been established at Harmac on Northumberland channel because of its central location with respect to the logging camps, sawmills and plywood plants of the operating concern.¹ These plants will supply the chips forming the raw material from which the sulphate (kraft) pulp will be produced. A bleaching plant is to be added in the future. Power is obtained from the John Hart project and water via a pipe line from "Ranney Water Collectors" installed near the junction of the Nanaimo River and Haslam Creek. Production is expected to reach 225 tons of pulp per day. The expected employment will total about 225 persons, and the mill will thus have one of the largest single payrolls in the area.

¹ Crispin, C. Manager, Nanaimo Sulphate Pulp Ltd., letter to the writer, dated August 15, 1949.

TABLE VIII

SHIPMENTS OF LUMBER FROM
THE ASSEMBLY WHARF, NANAIMO¹

	Deep Sea ²		Rail ³		Total
1947	54,681,744	FBM	9,341,202	FBM	64,022,946 FBM
1948	53,168,673	"	11,457,930	"	64,626,603 "
1949	49,001,216	"	8,716,233	"	57,717,449 "

1. From figures supplied by Johnston National Storage Ltd., operators of the Assembly Wharf, Nanaimo.

2. Cargoes of lumber loaded on deep-sea ships for export.

3. Shipments loaded onto rail cars (C.P.R. & C.N.R.) at the wharf for Canadian and United States rail points. The cars are switched onto car barges at the respective ferry slips for transportation to mainland rail lines.

The allied metal-working trades have maintained a small but consistent importance throughout the development of the Nanaimo area. The first group of miners sent to the Nanaimo area included a blacksmith.¹ Since that time, there have always been metal-workers of some type in Nanaimo. By 1891, there were three blacksmiths, a carriage and waggon maker, and a foundry and machine shop in the city. Besides the independent establishments, many skilled metal-workers were employed by the mining companies, thus providing a nucleus of employees for the industry. At the present time there are in Nanaimo about eight metal-working establishments, apart from those servicing and repairing automotive equipment.

Much of the output of the present metal-working firms is taken up in supplying the ordinary demands of the population. However, they also do a great deal of work for industrial firms. Some repairs to logging and farm machinery can be done locally, as well as repairs to propellers and other installations for fishing boats. One firm has supplied specially designed equipment for the Biological Station at Departure Bay. In keeping with the new function of the area as a distributing centre, a large volume of the work done in Nanaimo is associated with the maintenance of automotive vehicles. In addition to the firms which specialize in machine and metal work, nearly all the many local garages and service stations

1 McKelvie, op. cit., p. 176.

employ mechanics skilled in automotive repair. The establishment at Nanaimo of a school for training automotive mechanics and diesel maintenance men¹ should ensure a continuing local skilled labour force. Some of the metal-working plants in the area are still housed in the same buildings in which they were established during the coal-mining period, but their improved facilities enable them to meet present day requirements.

Secondary industry in the Nanaimo area is still dependent upon the prosperity of the primary industries and is not likely to assume independent importance in the foreseeable future.

III. THE TERTIARY INDUSTRIES

The tertiary industries comprise the greater part of all economic activity in the Nanaimo area today. These industries are concerned with the retail and wholesale distribution and the transportation, rather than the production, of goods. With them are grouped the service industries which provide administrative, personal, professional and technical services for the public. Such activities can support a greater population than can primary or even secondary industries, but an economy based upon non-productive occupations is in a more vulnerable economic position in times of depression.

¹ British Columbia, Report of Department of Education, 1948-1949, p. n. 114.

Without its central location with respect to other Vancouver Island communities and to Vancouver, Nanaimo might not have attained its present status as a distribution and service point. The facilities upon which the present tertiary economy depends were, in great measure, developed to supply the needs of the mining community.

A. Retail Selling

The retailing of goods became a firmly established business during the coal-mining period. The sale made by the Hudson's Bay Company in 1861 included the single store operated by the Company. By 1882-83, when the population of the area was only about 2,000 there were fifty-one retail outlets in the town. In 1901 these had increased only by ten. In 1947, "trade" establishments in the Nanaimo area numbered only sixty-eight.¹ The number of retail establishments operating during the mining period in Nanaimo would still outrank those of any other Vancouver Island centre except greater Victoria.

Retail selling in the Nanaimo area of today is second only to Victoria in numbers of establishments, and in the size of its payroll. (See Table IX). The volume of retail sales in Nanaimo was, in 1941, the fourth largest in the province, being exceeded only by those in Vancouver, Victoria and New Westminster. (See Tables X and XI).²

1 British Columbia, Regional Industrial Index, 1949, p. 196.

2 *ibid.*, 1948.

TABLE IX
RETAIL OUTLETS IN SOME VANCOUVER
ISLAND CENTRES - 1947 ¹

	No.	Percentage of total industrial establishments	Payrolls	Percentage of total industrial payrolls	Average Payroll
Greater Victoria	381	27.2%	\$ 5,819,095	18.8%	\$ 5,728.39
Nanaimo area	68	20.2	680,096	11.3	10,001.41
Alberni area	48	18.8	274,963	2.7	5,728.39
Duncan area	42	17.2	263,820	7.5	6,281.43
Courtenay area	25	18.0	160,819	7.6	6,432.76
Ladysmith area	16	26.2	74,048	3.4	4,628.00

1. Adapted from Regional Industrial Index, 1949 edition

TABLE X

RETAIL SALES OF CERTAIN INCORPORATED
CENTRES OF BRITISH COLUMBIA, 1941 ¹

	\$
Vancouver	145,205,000
Victoria	36,761,000
New Westminster	13,064,000
NANAIMO	5,858,000
Trail	5,117,000
Nelson	4,189,000
Prince Rupert	4,187,000
Kamloops	3,839,000
Vernon	3,705,000
Chilliwack	3,606,000
North Vancouver	2,885,000
Courtenay	2,579,000
Duncan	2,511,000
Port Alberni	2,341,000
Cranbrook	1,938,000
Prince George	1,577,000
Mission	1,511,000
Rossland	1,109,000
Revelstoke	1,073,000

1. Regional Industrial Index, Regional Development Division,
Dept. of Trade and Industry, p. 178.

TABLE XI

Retail Sales of Nanaimo and British Columbia¹
1931, 1941, 1948.

Year	Total- British Columbia	Nanaimo	% of total
1931	207,578,000 ¹	4,326,000 ¹	2.0
1941	309,573,000 ¹	5,858,400 ¹	1.8
1948	731,420,000 ³	7,000,000 ² (est.)	1.0 (approx)

1. "Census of Canada," Ottawa, Dominion Bureau of Statistics
2. Bureau of Economics and Statistics, Victoria, B.C.
3. "Retail Trade," Dominion Bureau of Statistics, Ottawa

1. Information supplied by Bureau of Economics and Statistics, Victoria, B.C.

B. Wholesale

The wholesale industry in the Nanaimo area is still in process of expansion. The older wholesale businesses are those handling groceries, bakery products, tobacco and other supplies. Wholesale firms have been established for the distribution of electrical equipment, optical goods, automotive parts and accessories. Much of the wholesale business in the area is still done through agencies of firms whose headquarters or branches are located in Vancouver. These agencies are usually operated in conjunction with retail establishments. There are few warehouses as yet in Nanaimo, and those at present in the city handle such items as flour and feed, groceries and similar products. It is possible that a warehouse district may develop in the vicinity of the steamship terminal, where sites accessible to transportation facilities could be made available.

C. Transportation

Transportation has been an important industry in the Nanaimo area throughout its history. Extensive facilities were developed to handle the movement of coal from the mines and at the present time economic activity revolves around the transportation of goods.

The early reports of the Chief Commissioner of Lands and Works indicate the processes of establishing local land

routes. Roads were built out from Nanaimo to mining areas, such as Harewood mine, and to shipping points such as Departure Bay.¹ The road pattern of the coastal plain region was developed through the linking of these early local projects. Much work has had to be done in succeeding years to straighten many of the roads so established.

Railway transportation on Vancouver Island was established as a direct result of coal-mining. The vexed question of the Esquimalt and Nanaimo Railway, which had led to threats of secession from Confederation by British Columbia,² was finally settled when Robert Dunsmuir undertook construction of the line.³

The waterfront site at Nanaimo was occupied by the lines and loading facilities of the Vancouver Coal Company, and Dunsmuir was equally as anxious to reach the shipping facilities as the market of Victoria. During Dunsmuir's ownership, the line was built to Nanaimo in 1886, and to Wellington in 1887. Extension to Port Alberni, Crofton, Courtenay and other points took place after the Canadian Pacific Railway assumed ownership of the Esquimalt and Nanaimo Railway, in 1905. Since Wellington was for many years at the end of

1 Report of Chief Commissioner of Lands and Works, British Columbia, 1876.

2 A railway on Vancouver Island was to form part of the transcontinental line which was to be built in fulfillment of the terms under which British Columbia joined Confederation in 1871.

3 Cowie, A.P., Early history of the Esquimalt and Nanaimo Railway, unpublished address, p. 3.

steel, roundhouse facilities were established there which still exist. The railroad is an important source of employment in Wellington today.

Coal-mining activity was primarily responsible for the state of development of the harbour facilities in the Nanaimo area. The larger firms operated fleets of their own ships, as well as providing accommodation for other vessels. The Vancouver Coal Company dominated the Nanaimo waterfront, for by 1913 the whole waterfront from Commercial Inlet southward was occupied by Company installations. Other public and private facilities were located to the north. On Departure Bay the Company had further facilities for the Bechin mine. A smaller mining company had a pier in Townsite, where its railway line from East Wellington reached tidewater.¹ Smaller mining companies operated loading facilities at Boat Harbour and on Nanoose Bay. The present waterfront rail transfer points were established as a direct result of coal mining. Western Fuel built a car ferry slip which still handles freight car barges for the Canadian National Railway Company.

The E. & N., excluded from the Nanaimo waterfront, had built a ferry slip at Ladysmith, where loading facilities of the Dunsmuir Company were located, in 1899.² In 1921, a greater flow of traffic necessitated the construction by the C.P.R. of the slip at Jayem on Nanoose Bay.

1 Canada, Dept. of Marine and Fisheries, Port Directory, 1913 and 1914, Ottawa.

2 Cowie, op. cit., p. 5.

The transportation industry today has a new purpose; new facilities have been built and a changing transportation pattern is emerging. The Nanaimo area is the central rail distributing point for Vancouver Island.¹ Necessity for efficient handling is leading to progressively greater centralization of transportation facilities.

Commercial road traffic is handled by busses and trucks on both a local and regional basis. Local passenger traffic is handled by city and district bus lines radiating from the terminal on the harbour.²

Regional bus lines operate from the same point. Local trucking firms comprise the greater proportion of transportation establishments in the town. The Alberni area supports 32 transportation firms having an average payroll of \$13,000. and the Nanaimo area has 28, but average payrolls are only about \$9,000. per annum. Since several large firms are included in the figure for establishments, it is obvious that many small firms are involved also. Regional truck lines radiate from Nanaimo over a wide area. Freight rates from Vancouver are the same to Victoria as to Nanaimo, while the divisional point of rate equalization for larger shipments by truck is at the midway point of Duncan.³

1 Glover, M.H.A., Bureau of Economics and Statistics, Dept. of Trade and Industry, letter to the writer, August 23, 1950.

2 Vancouver Daily Province, "New Bus Run scheduled for Nanaimo," May, 1950, p. 17.

3 Scouler, J. Manager, Island Freight Service Ltd., letter to the writer, June 8, 1949.

The trucking lines which operate from Nanaimo compete with scow and barge firms. However, they are able to provide a more frequent service. Two trips a day are made by trucks to Port Alberni, whereas water-borne cargoes only reach that city three times a month. One of the two regional trucking lines has facilities in the waterfront terminal.

The importance of rail transportation in the functioning of the Nanaimo area as a distribution point is hampered by the continuing pattern of facilities developed during the coal-mining period. Shipments carried over Canadian Pacific Railway lines are taken by scow to Ladysmith or Nanoose Bay and are transferred to the Esquimalt and Nanaimo line there, rather than at Nanaimo. However, the railway may move these facilities to the terminal, together with its station and roundhouse and shops which are now located at Wellington.¹ Some coal is at present shipped to other Island points via rail, but most is carried by water. The rate structure established in July, 1949, should centralize rail freight movements on Nanaimo rather than on Victoria.

The provision of new harbour facilities has made possible the expansion of the local transportation industry. Both foreign and domestic cargoes are handled at the Assembly Wharf and the smaller wharves, but no cumulative records are kept of the latter movements. Domestic traffic between

¹ 1950 Journal of Commerce Yearbook, Supplement, 17th Annual Edition, p. 252.

Vancouver, Nanaimo, and other coastal points is, however, of greater volume than foreign shipments.

Comparison of the tonnages handled by British Columbia ports can only be made on the basis of foreign shipments. Although these give some indication of the activity of the port of Nanaimo, they do not present a true picture of the scope of local operations. (See Table XII). While many coastal ports export vast quantities of specialized products, those of Nanaimo contain a greater variety of goods. Both coal and lumber products are important exports (see Table XIII p. 131A.) The proportion of these exports from Nanaimo is undergoing a change. As coal exports decline, the volume of others, particularly forest products, is increasing (see Figure 20). The exact proportion of these tonnages which comprise lumber products cannot be determined, because figures on such shipments are issued on the basis of board feet. The average annual shipment of lumber for export from Nanaimo is about 60 million board feet (see Table VIII, p. 118). Comparison of the exports of forest products from Vancouver Island points in 1947 indicates that Nanaimo, least important as a lumber exporter, leads in the export of unmanufactured forest products. (See Table XIV). This reflects the scope of secondary forest industries in the area. Other wood products, and the by-products of wood processing, exported from other centres, formed no part of the exports from Nanaimo.

TABLE XII

MOVEMENT OF FOREIGN SHIPMENTS
THROUGH BRITISH COLUMBIA PORTS ¹

(in short tons)

	Total	Inward	Outward
Vancouver, 1948	4,339,118	2,307,240	2,031,878
New Westminster, 1948	796,313	26,663	769,650
Port Alberni, 1947	268,139	6	268,133 (2)
Victoria, 1948	256,247	25,995	230,252 (2)
Chemainus, 1947	211,659	438	211,221 (2)
NANAIMO, 1947	195,143	2,352	192,791
Power River, 1947	166,341	33,134 (3)	133,755 (4)
Ocean Falls, 1947	89,341	56,652	32,689
Quatsino, 1947	66,761	63,245 (3)	3,516
Prince Rupert, 1947	20,917	17,789 (5)	3,128

1. From Regional Industrial Index, 1949 edition.
2. Chiefly lumber products
3. Chiefly petroleum and petroleum products
4. Chiefly newsprint
5. Chiefly fish

TABLE XIII
FOREIGN CARGOES LOADED AND UNLOADED IN
THE PORT OF NANAIMO, 1947.¹

Short Tons

OUTWARD:

lumber, timber, box, crate, cooperage material	81,458
logs, posts, poles, pit-props, piling	76,279
coal, bituminous	34,301
fish, fresh, frozen, cured	552
all other freight	201
Total	192,791

INWARD:

gasoline	1,814
all other freight	272
castings and machinery	152
petroleum, crude	114
Total	2,352

1. From Regional Industrial Index, 1949 edition, p. 195.

Figure 20.

Foreign-bound Cargoes, 1938-47

Coal: from reports of Minister of Mines

Total volumes: from figures supplied by
Bureau of Economics and Statistics,
Dept. of Trade and Industry, Victoria.

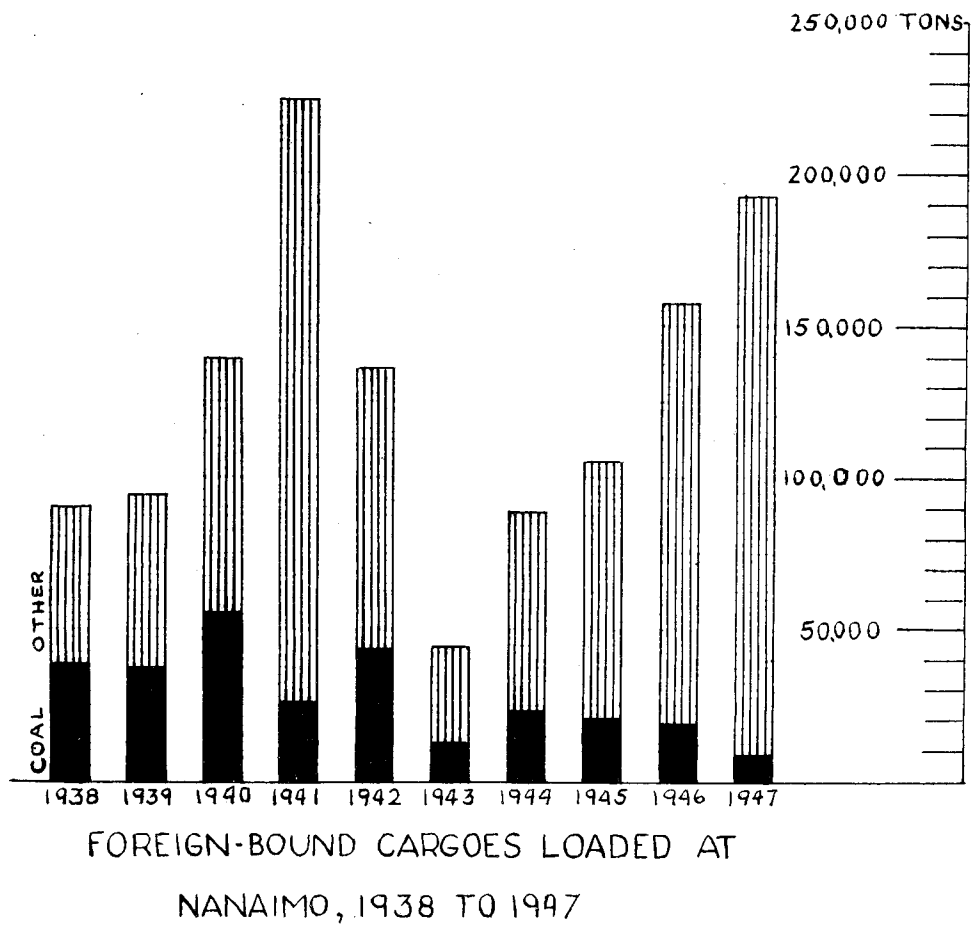


FIG. 20

TABLE XIV

Cargoes of certain forest products
loaded for foreign countries at
Vancouver Island ports.¹

(in tons)

	Lumber, timber, box, crate, cooperage material!	Logs, posts, poles, pit-props, piling.
Port Alberni (1947)	198,835	1,648
Chemainus (1947)	185,841	17,985
Victoria (1948)	175,349	8,770
Nanaimo (1947)	81,458	76,279 ²

1. From Regional Industrial Index, 1949 edition.
2. Comprised largely of telephone poles, etc. (Source, Scaling and Royalty Reports, Nanaimo office, B.C.F.S.)

Petroleum, and petroleum products comprise the greater part of the foreign cargoes landed at Nanaimo (see Table XIII p. 131A.) This is true in many British Columbia ports. At Quatsino, second largest importing point in the province, (see Table XII, p. 131) such products form about 80 per cent of the imports. The volume of this traffic results from the decentralization of the logging industry as forest reserves are consumed. Development of this trend could remove much of the distributing industry from the Nanaimo area.

D. Administration

Part of the local tertiary and servicing industry is concerned with the functioning of upper Vancouver Island administrative units. Nanaimo is the scene of all Assize and Supreme Court trials from Duncan north. Nanaimo is the headquarters of the Vancouver Island Union Library serving the area from Mill Bay, Shawnigan Lake and Cowichan Lake, to Campbell River and the Albernis. Other headquarters include those of the Upper Vancouver Island Public Health Unit, and the Regional office for the Federal Department of Fisheries, administering an area between the Island and the mainland from Howe Sound north to Cape Caution. Another unorganized regional function centred in Nanaimo is recreation. The local ice-rink, the only one north of Victoria, attracts patrons from a wide area. As might be expected, no official of the Provincial Department of Agriculture is stationed in

the city, while the headquarters of the Provincial Inspector of mines has now been transferred to Cumberland.

Administration of Vancouver Island transportation lines is also being centralized in Nanaimo¹; already the main maintenance garage, ticket offices and administrative facilities of the regional bus line have been moved from Victoria to the city terminal.

Economic activity in the Nanaimo area which had declined as coal-mining declined, is now entering a new period of development. What new functions will accrue to the Nanaimo area, and the extent to which present functions will be maintained and expanded will depend less upon environmental and other factors within the area than upon happenings of world-wide significance as they affect the market for lumber, and the general prosperity of Vancouver Island.

1 1950 Journal of Commerce Yearbook, Supplement, Seventeenth Annual Edition, p. 252.

CHAPTER VI

THE CULTURAL LANDSCAPE OF THE NANAIMO AREA

The cultural landscape comprises all the changes upon the earth's surface brought about by the interaction of man and his environment. The direct evidence of coal-mining in its influence upon the cultural landscape of the Nanaimo area is not, today, of major importance. Indirectly, however, the industry has affected many of the cultural landscape features, since they have evolved as the local adaptation to a coal-mining economy. The patterns developed during the coal-mining era are being over-laid by new patterns evolving from the changed occupancy of the area and the new interrelationships being brought into play.

I PRIMARY LAND USE

The amount of land at present being used for mining in the Nanaimo area is not very extensive, but the influence of mining upon the use of land by other primary industries has been very important. Both the patterns of agricultural and forest land use were developed in accordance with the varying relationships between these industries and the dominant mining industry.

A. Agricultural Land Use

The distribution of land used for farming in the Nanaimo area is governed primarily by the availability of arable land. Farms are therefore concentrated into two chief districts; the valley of the Millstone River from Brannen Lake to the outskirts of the city, and the broad valley from Nanaimo Harbour to Ladysmith Harbour. (See Figure 21).

In neither of these districts are large contiguous farming areas found. Rock outcrops and stretches of poor soil intervene, limiting the extent of cleared and cultivated land. In these two districts farming is carried on in a patchy pattern which becomes more compact in the immediate vicinity of lakes and streams. These are the areas where the most extensive deposits of deltaic and lacustrine soils have been laid down. In the vicinity of Cedar, much of the cultivated land includes areas of residual shaly soil which can be cultivated because it is mixed with the adjoining deposits of more fertile soils.

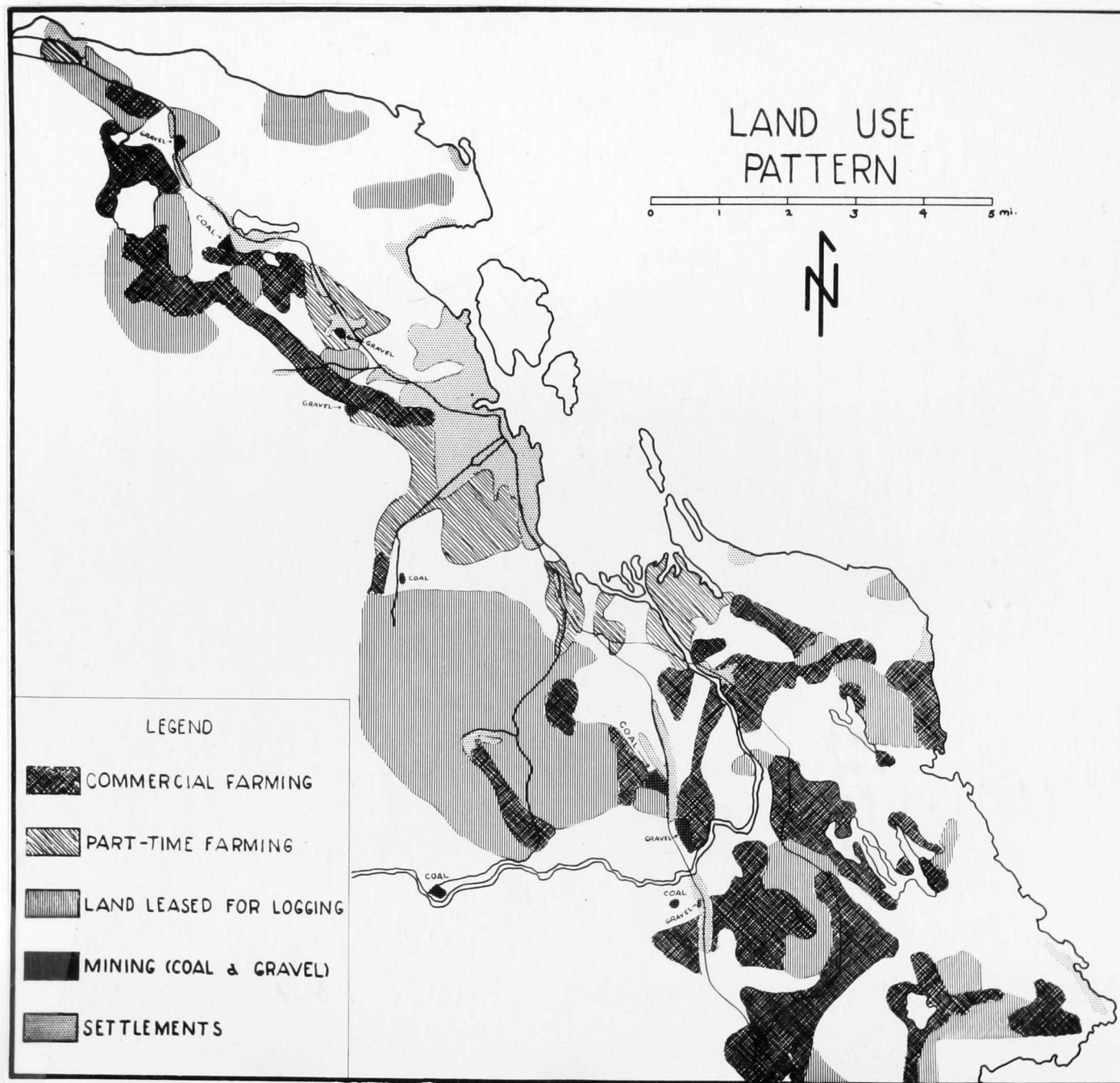
Elsewhere, farm lands form an even more scattered pattern. Smaller farming districts have been established in valleys occupied by creeks and small lakes, or in swamps where black muck deposits have formed. The Extension valley floor is occupied by such a limited agricultural district. Throughout the whole area, small patches of swamp have been cleared and drained for farming although they may be surrounded by fairly extensive tracts of forested land.

Figure 21

Land Use

Base map: B.C. Forest Service, 1937.

Land leased for logging: from Management
Sheets, Nanaimo Office, B.C. Forest Service



Even though the form of the agricultural land use pattern owes nothing to coal-mining, its extent is directly attributable to the industry. The districts around Nanaimo have been settled for a comparatively long period, because of their early development as coal-mining areas.

"Due to the fact that the district has been settled for so long and has been so carefully picked over for tillable soils, there are no areas available for new farm settlement aside from small holdings. There is also little possibility of increasing the cultivated acreage on existing farms for in most cases clearing has been carried to the extreme edges of the tillable soil."

Of all the upper Vancouver Island areas where the soil survey was made, the Nanaimo-Ladysmith district was the only one in which cultivated acreage exceeded the area of arable soil. (See Table II, p. 69). Not every acre of arable soil is under cultivation, nor is every cultivated acre arable soil. However, the process of trial and error by which the distinctions between arable and non-arable soil were formerly made has been carried on long enough to make the distribution of arable soil and of cultivated land conspicuously similar.

There is little evidence of zonation with regard to types of farm produce throughout the area. All parts of the area are fairly to easily accessible to the main centres of population. The governing factor in deciding the types of product in an area is the extent of arable land available. Thus, while there are three dairies in the immediate vicinity of Nanaimo, there are others near Wellington, Lantzville,

Cedar, Cassidy, and in the Millstone Valley. The local florists have their nurseries in and near the city itself, but most of the locally grown vegetables are produced in market gardens at considerable distances from the town. The more distant farms tend to have larger fields of hay than do those closer to the city, yet fairly large hay fields are found in the residential area immediately west of the city.

The distribution of part-time farming areas has been associated with coal-mining activity and is now related to the accessibility of such areas to the centres of population and employment. Part-time farming became more important in the vicinity of Vancouver Coal Company operations than in the vicinity of Dunsmuir mines. Harewood, Northfield and Chase River have part-time farms which appear to have been in operation some considerable time. Near Extension, Wellington and South Wellington commercial, rather than part-time, farms predominate. Many part-time farms are now being operated in conjunction with industries of the distributing complex, so that newly cleared part-time farms are in evidence at Cedar, Chase River, Northfield and Wellington. Part-time farming, however, seems to be associated with the distribution of partly-arable soil. Good soil is in demand for more intensive cultivation, non-arable soils do not give adequate returns for the labour and money involved.

The more centralized organization now evolving in the area may give rise to a more strongly zoned pattern of agricultural land use. The demand for residential space may push full-time farming operations to the periphery while accentuating the developing pattern of part-time farming on the outskirts of settled areas.

B. Forest Land Use

The pattern of land utilization for logging in the Nanaimo area is not stabilized with regard either to its form or to its extent. All the land within the Nanaimo area has already been logged-over and most of the arable soil has been brought under cultivation, so there are few areas of any great extent now covered by large stands of merchantable timber. Both the above-mentioned factors stem from the development of the area in conjunction with coal-mining.

Small firms lease blocks of land for logging purposes in the vicinity. Those leased in 1948 give an indication of the pattern of land utilization for forest purposes in the area. (See Figure 21, p. 136). Logging lands occupy the interstitial spaces between the farming areas, where rock outcrops and non-arable soils prevent profitable cultivation. These blocks of land are cleared within a few years, when new areas are leased. The actual extent of land leased for logging thus fluctuates constantly, but the general pattern remains the same.

In some parts of the area, the land is used neither for logging nor for farming. Some of these tracts have recently been logged, while others have not yet been logged. Much land is covered with immature timber. Near the confluence of Haslam Creek and the Nanaimo River, the soil is so stony that it has not produced a merchantable crop in the period since it was first cut over.¹

Toward the western margin of the area, tracts leased for logging become more extensive and more nearly contiguous. This reflects the lack of arable soil. Greater slope and more common outcroppings of rock together with the greater prevalence of forest soils have discouraged the development of agriculture. These leased areas, although near the tracts in the mountainous interior leased by the large logging firms, are in logged-over stands and are being operated by the smaller local firms which are typical of the Nanaimo logging industry.

C. Land Utilization for Other Primary Industries.

The land used by the fishing industry in the Nanaimo area is for commercial and transportation purposes, rather than for fishing in itself as a primary industry.

Coal-mining does not occupy a great areal extent of land at the present time. Evidence of the greater previous use of land for mining is to be seen in the distribution of dumps of mine refuse throughout the area. Near Extension,

1 Spilsbury, loc. cit., p. 41

at least, these dumps encroach upon the limited acreage of fertile land. (See Figure 22).

The only other mining activity, the production of gravel, makes limited use of the land in scattered localities. The pits are near Lantzville, East Wellington, Cassidy and Northfield. (See Figure 21, p. 136). Recently, gravel has been recovered from the bed of the Nanaimo River near Cedar. Numerous small gravel pits have been used from time to time throughout the whole area.

II SETTLEMENT PATTERN

One of the basic features of the cultural landscape is the pattern developed by settlements. Settlement patterns are of two types, agglomerated and dispersed, of which the former predominates in the Nanaimo area.

Settlement patterns are clearly the result of early coal-mining activity, although a new settlement pattern is being superimposed upon the old. During the period of coal-mining activity, clustered settlements arose wherever coal could most easily be reached. For this reason, a zone of mining settlements was established near the western margin of the workable seams. (See Figure 23). In this vicinity, actual coal outcrops occurred, or drilling proved that the coal horizons were accessible. Mining development followed and the establishment of settlements.



Figure 22.

Extension

This mine dump at Extension, about 100 feet in height, encroaches on fertile bottom land of the valley floor.

Figure 23.

Coal Seam and Mining Villages

Base map: B.C. Forest Service, 1937

Coal seams: Paper 47-22, G.S.C., by
A.F. Buckham.

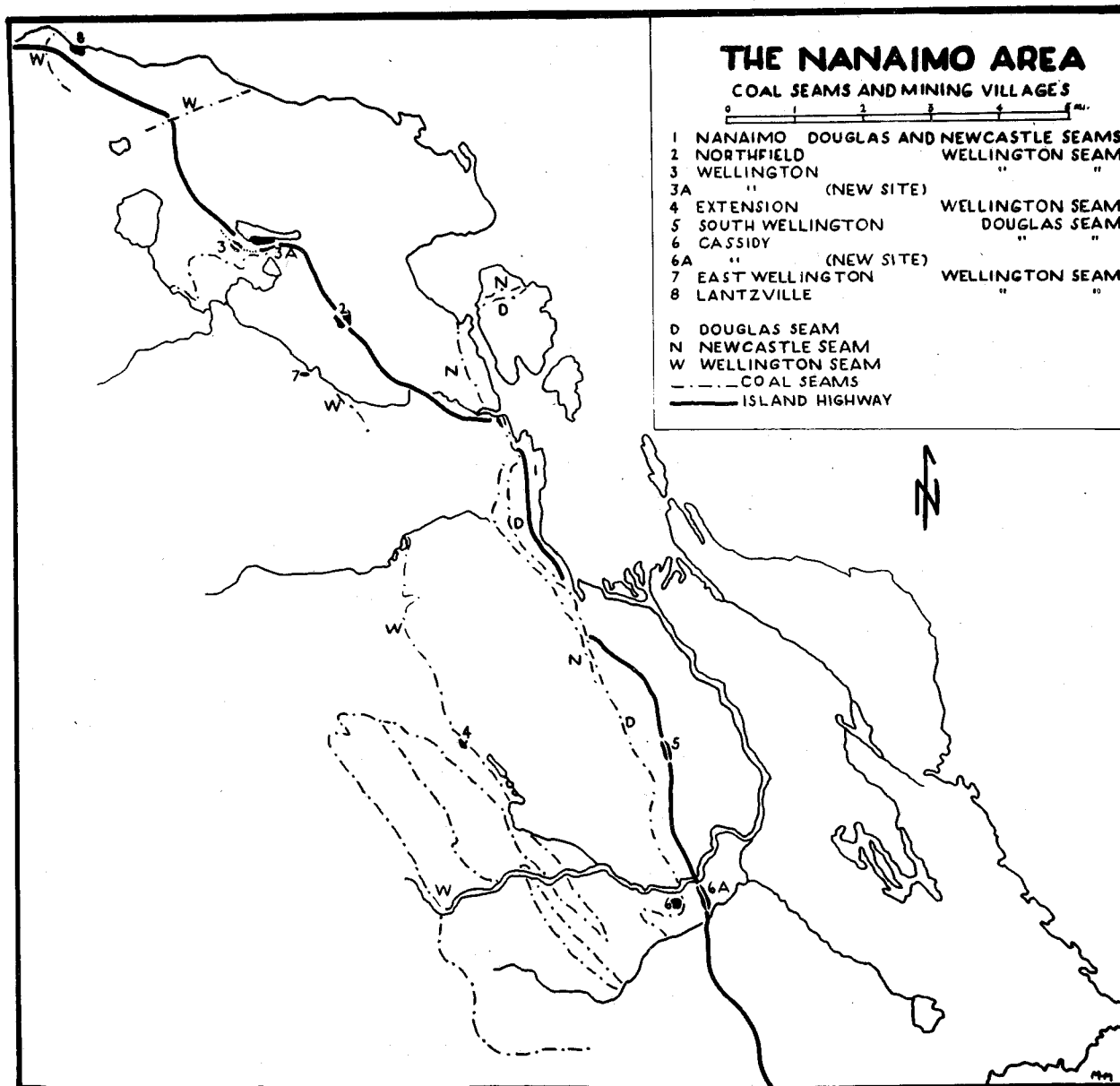


Figure 23.

The villages of South Wellington and Extension and the original settlement at Wellington were established by the Dunsmuir firm. Nanaimo and Northfield were founded by the Vancouver Coal Company. Cassidy was originally the model townsite for the Granby mine, and East Wellington and Lantzville were developed by the East Wellington Coal Company and the Vancouver-Nanaimo Coal Company respectively. The policies of these firms had much to do with the development of the villages. The Vancouver Coal Company encouraged its workers to become permanent residents, but many workers for the Dunsmuir firm were, in the early years, transient immigrant labourers.

Settlements developed during the coal mining period in a linear pattern near the western edge of the field. The settlements themselves usually had compact patterns.

The change in occupancy of the Nanaimo area is imposing a radial settlement pattern upon the linear pattern already developed. Settlement is spreading outward from Nanaimo along the main highways leading from the town, almost linking the earlier communities. Near the town, the radial skeleton is being filled in. While the more remote settlements are not so directly involved in this phenomenon, linear patterns are being imposed upon them in keeping with the growing radial settlement pattern throughout the area.

One effect of the change from a mining to distributing economy has been the migration of the settlements of Wellington and Cassidy. The mining communities were established in the best locations for reaching the coal seams. When large-scale mining ceased, the settlements migrated toward the adjacent highways and developed linear patterns along these roads. In the case of Wellington, the newer part of the community, which had been laid out as a residential area located on the Island Highway, survived while the older part of the settlement disappeared. Cassidy is now in a completely new location. The old site is deserted. (See Figures 24 and 25).

III STREET PATTERNS OF THE NANAIMO AREA

Within the general pattern of settlement in the area of this study, more detailed urban patterns are discernible. Street patterns are responding to the same influences which affect the overall settlement pattern. During the coal-mining period compact street plans, often artificial, were developed to suit the necessities of coal-mining. Since the decline in the industry the necessity for accessibility to highways and the modern increase in the private automobile ownership has encouraged the development of more linear urban development.

A. The Street Patterns of Nanaimo

Nanaimo, although founded as a coal-mining centre, has been less completely dominated by the industry than some of the smaller settlements have been. The original town was laid out



Figure 24.

The Tipple, Cassidy.

The abandoned tipple of the
Granby Colliery dominates
the deserted townsite.



Figure 25.

Cassidy

Two concrete buildings on the former townsite of Cassidy. The one on the left is the only inhabited building in the vicinity.

by the Vancouver Coal Company but it has always performed a greater variety of functions than have the smaller centres. An important factor in determining the actual pattern of the streets has been that of local topography.

The present city centre was originally a peninsula, divided from the mainland by an arm of the sea extending from the head of Commercial Inlet toward the Millstone River. (See Figure 26). South of Commercial Inlet the land rose rather abruptly from the sea with small rocky islands lying off-shore. From the former inlet the ground slopes up sharply to a ridge, in places over 200 feet above sea-level, about one-half mile inland from the shore in a formation roughly reminiscent of an amphitheatre. To the south, the rim of the amphitheatre merges with a rocky upland along the coast, and to the north it dips to the Millstone River. Steep slopes run to the river and the sea in that part of the city lying north of Millstone. Immediately behind the city the ground drops sharply to a stretch of land in which some fertile soil is found. This district is about one mile wide. Behind it again the ground rises rather uniformly to the east flank of Mount Benson.

Varied adaptations to surface configuration have had to be made which, in conjunction with the progressing development of the city, have given rise to three distinct "towns" within the city and its environs.

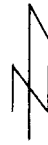
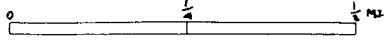
Figure 26.

Original topography of Nanaimo

Base map and contours: Nanaimo Sheet,
Dept. of National Defence, 1941.

Shoreline: map in office of City Engineer,
Nanaimo, dated 1891 and undated maps in
the Bastion Museum, Nanaimo.

ORIGINAL TOPOGRAPHY of NANAIMO



The first of these towns is reflected in the street pattern of the present commercial centre of the city. (See Figure 27). The pioneer community was seen by Mayne, an officer in the Royal Navy, who described it as follows:

"The town, such as it is, stands upon a singular promontory Along the shores are the colliery buildings and about a dozen remarkably sooty houses, inhabited by the miners and the few Hudson (sic) Bay Company officers here. There is a resident doctor in the place, who inhabits one of these houses, and to the left of them stands the Company's old bastion...."¹

The town was centred on Commercial Inlet where one of the mines was located and where shipping facilities had been developed. (See Figure 17, p. 85). A road later led toward Wellington. As the town grew, a causeway was built connecting the southern end of the promontory with the mainland and the inlet was eventually filled in with refuse by the mine company.

The congested pattern of curving streets in the city centre still outlines the pattern of the old peninsula. (See Figure 28.)

Soon after the sale of the town to the Vancouver Coal Company, settlement began to spread up the slopes beyond the inlet. The first large home in the community was built in this locality in 1862.² When a number of houses had been built, the company undertook to lay out a plan for the street pattern of the settlement.^{3,4} The necessity of adapting a

1 Mayne, R.C., Four years in British Columbia and Vancouver Island, London, John Murray, 1862, p. 35.

2 Vancouver Daily Province, May 20, 1950.

3 British Columbia Directory, 1891, p. 37.

4 Nanaimo Free Press, Jan. 29, 1891.

Figure 27.

Street Patterns

From Nanaimo Sheet, Dept. of National Defence,
1941.

- A. Pioneer Community
- B. Coal-mining Community
- C. Present Community

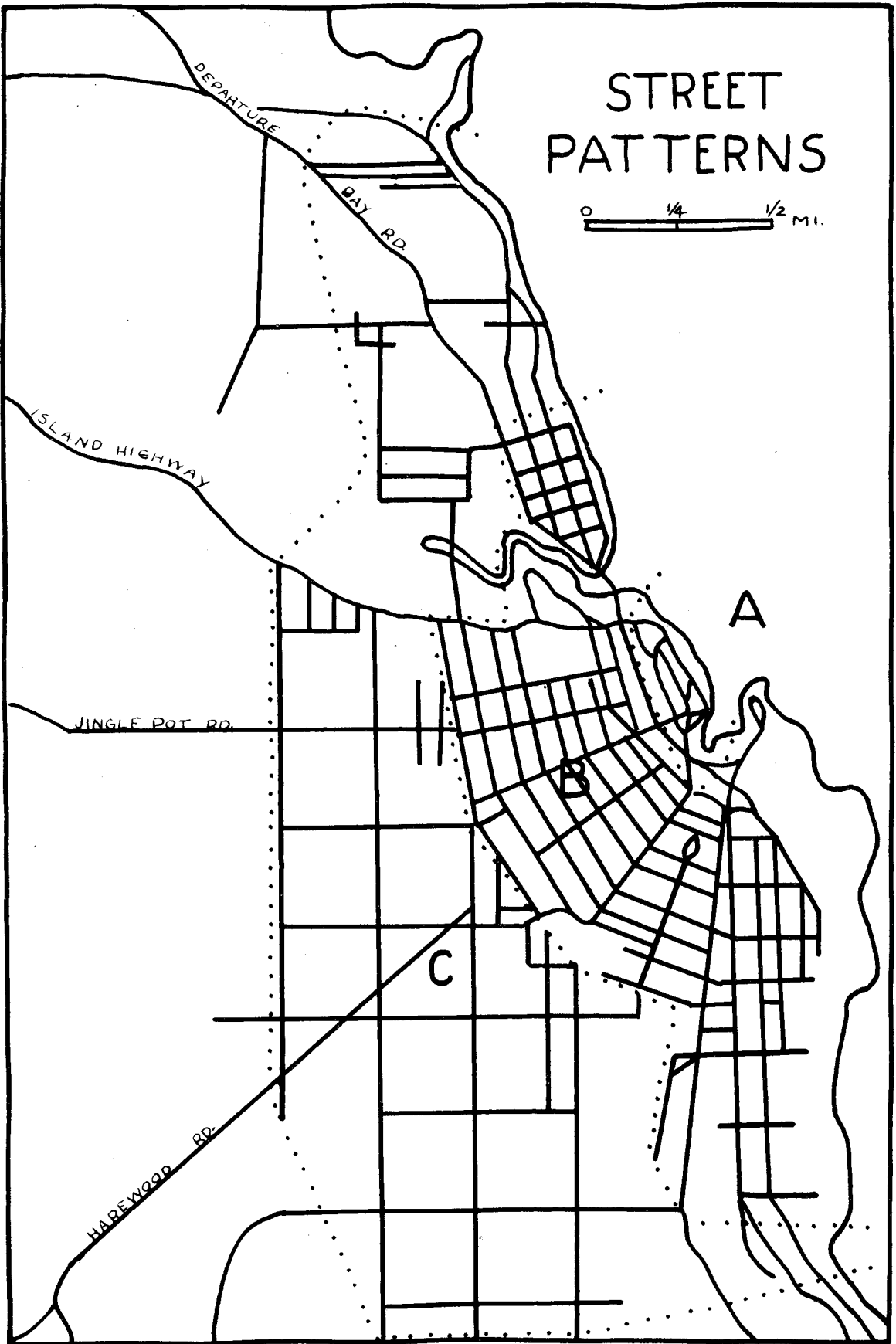


Figure 28.

Nanaimo - 1875

General view of Nanaimo in 1875.
The causeway between the Ravine
and Commercial Inlet leads to
Commercial Street. The building
immediately east of the Ravine
bridge is the present city hall.

Photograph: Provincial Archives.



street layout to surface conformation led to the adoption of the radial plan evident throughout much of the city. This pattern of radiating main streets crossing the contours and concentric cross-streets following the trend of the contours covers most of the ground enclosed by the basin-like formation.

By 1890, the pattern of this most extensive section of the city proper was well-developed. The radiating streets extended as far as the city limits of that time. (See Figure 29). The Ravine had not as yet been filled in, but the causeway had been built. Settlement had not spread much up the steep slopes of the town, although it had spread across the Millstone River to the newly opened residential area known as Newcastle Townsite.¹

Immediately west of the town the flatter land had been divided into forty acre blocks and subdivided into five acre lots for the settlement of company employees upon small farms. This land was "leased with option to buy".

The third town, that of the present day, extends beyond the present city limits to the north and west. It includes, as well as Townsite, the Harewood or Five Acres district, where the miners settled, and Brechin district north of Townsite. Brechin mine on Pimbury Point came into production in 1904. By 1912 only a few houses had been built in connection with the mine.² This mine was closed, owing to the strike, in 1914, but

1 Nanaimo Free Press, March 6, 1891.

2 G.S.C., Topographic map of the Nanaimo map-area, 1912.

Figure 29.

Nanaimo about 1890

Base map, street pattern, waterfront, coal company properties, from map in office of City Engineer, Nanaimo, dated 1891.

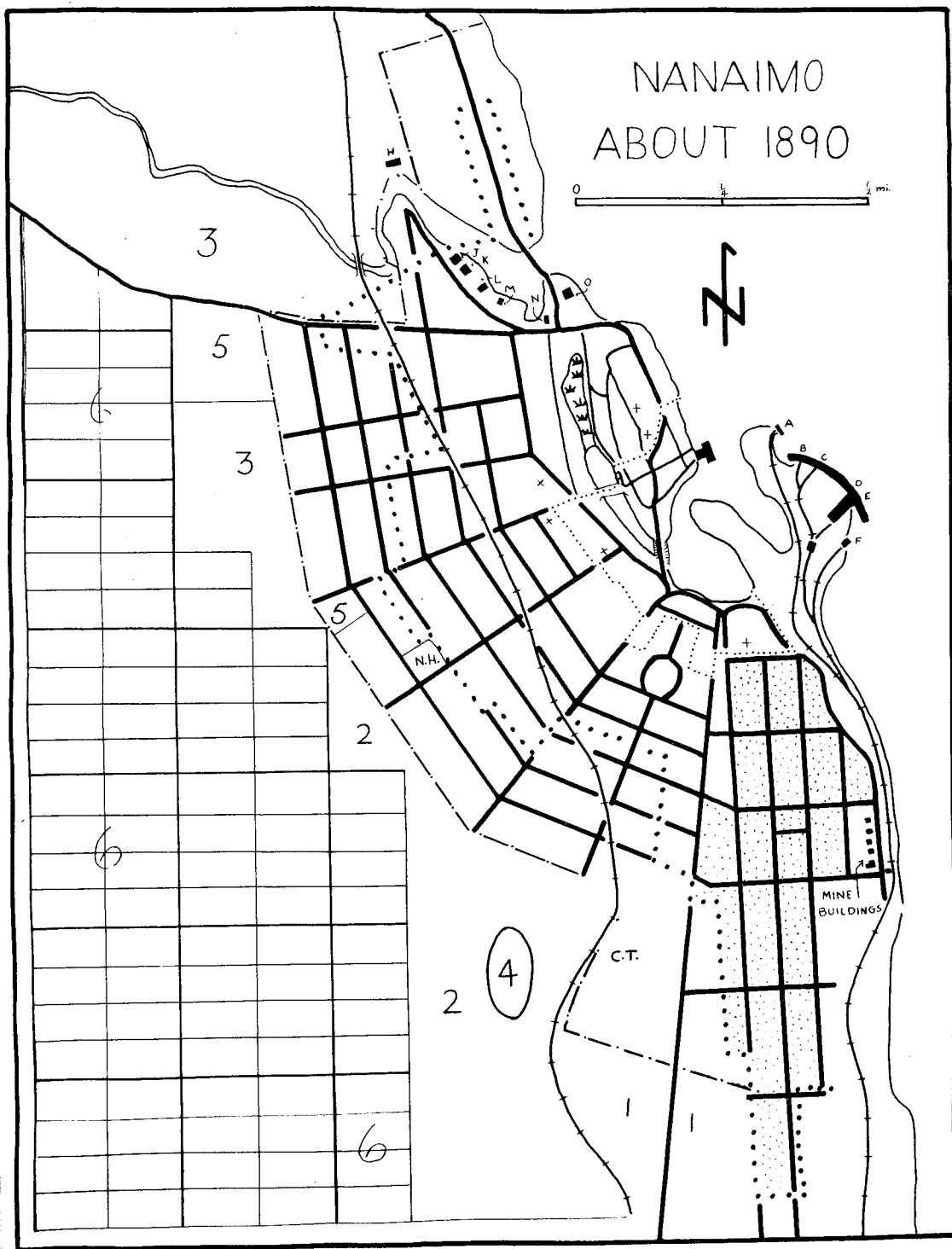
Functional areas from William's Victoria and Nanaimo Cities' Directory, 1890.

Industrial sites on Millstone River from sketch map drawn by John Cowie.

Legend

1. New Vancouver Coal Company's farm
 2. " " " " park
 3. " " " " reserve
 4. cricket ground (land donated by coal company)
 5. cemetery (" " " " ")
 6. land leased by coal company to employees with option to purchase.
-
- A. New Vancouver Coal Company's ballast wharf
 - B. " " " " loading "
 - C. " " " " " "
 - D. " " " " " "
 - E. " " " " " "
 - F. " " " " ferry slip
 - G. " " " " weigh house
 - H. Power House
 - J. Planing mill
 - K. Sawmill
 - L. Tannery
 - M. Brewery
 - N. Foundry
 - O. Sawmill (new site)
 - N.H. Nanaimo hospital (land donated by coal company)
 - C.T. Chinese section
 - + Church
 - limits of residential area
 - limits of commercial area
 - .-.-.- city boundary

The dotted area shows the district inhabited most densely by mining families.



it provided the nucleus of the present extension of urban development.

The street patterns of these newer areas conform more closely to the conventional block pattern of most North American cities. In Harewood the roads and streets follow the boundaries of the old forty acre and five acre subdivisions. Owing to the more moderate slope of the ground in this vicinity it is fairly well adapted to the needs of the population. In Townsite and Brechin the arbitrary street pattern is not always well adapted to the rougher nature of the topography.

The radial pattern of the second town extends through the newer residential areas in the form of the main road systems. In Five Acres, the road toward the old Harewood mine cuts across the regular block pattern. In Brechin the Departure Bay road is such a radiating highway. Settlement is spreading along these highways in the two areas, and along Comox Road (the Island Highway) beyond the city limits.

B. The Street Patterns of other Urban Centres

The street patterns of the smaller urban centres were usually planned by the mining companies operating in the vicinity. These patterns are in a sense artificial but served the needs of the communities. During the coal-mining period the purpose of the communities was to provide a location for the homes of most of the mine employees, compact enough for easy access to the mine and for provision of some social life in these more isolated settlements.

In Wellington nearly all traces of the original settlement, along what is now a side road, have disappeared, along with all traces of actual mining operations. (See Figure 30). The newer townsite is almost bisected by the Island Highway. The settlement is confined by the railway, two lakes and some higher ridges of ground. Its present day pattern is that which was laid out when the community was a town of some size.

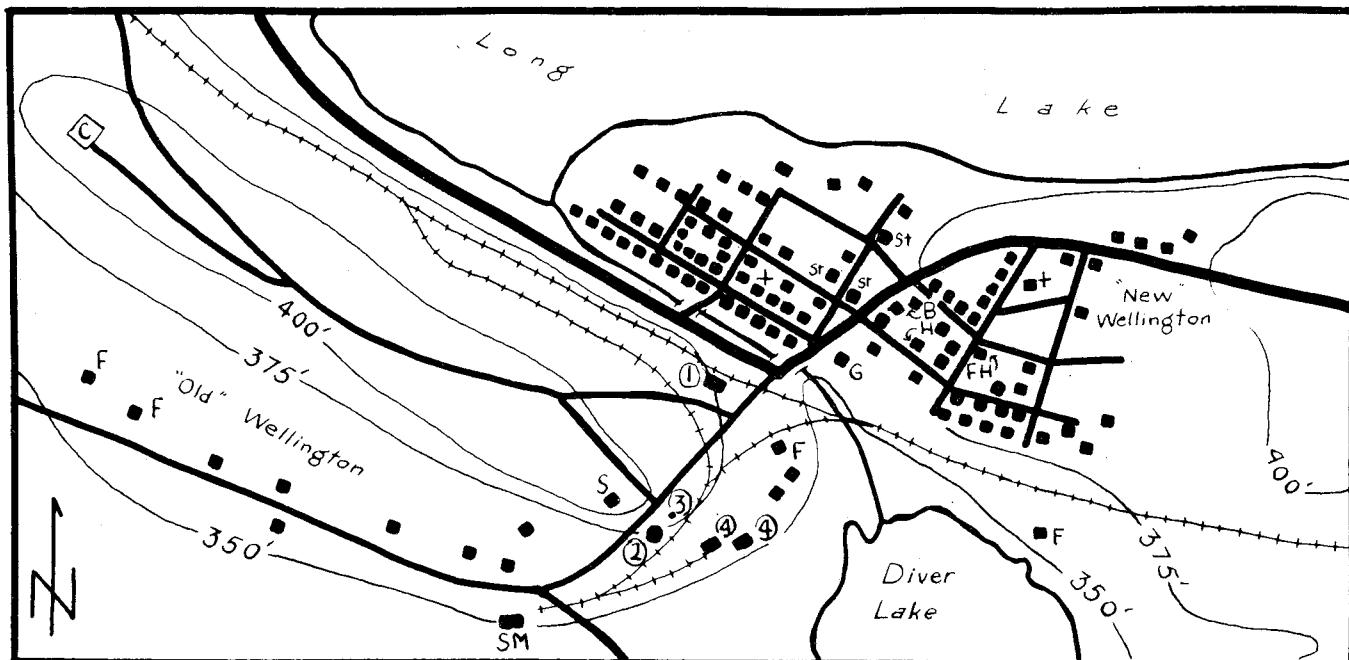
Extension is another former coal-mining community having an artificial street pattern. Topographic influences are much stronger in this area, since the settlement lies between two inward-facing cuestas in a valley floor with small lakes, creeks and swampy land. (See Figure 31). The complex street pattern of the settlement only intensifies the congesting effects of topography. Since most of these streets are, in actuality, roughly gravelled roads between the houses the pointless plan of the street pattern adds nothing to the attractiveness of the location.

Whereas many of the mining communities have been consciously laid out, the settlement of Cedar has developed without any type of regulation or restriction. Its attenuated linear pattern is more typical of the pattern of small settlements throughout the coastal plain of Vancouver Island. (See Figure 32). The community has developed gradually as a residential area with an upsurge in its population occurring since the end of World War II. Before the war, the community was a loosely knit settlement of homes interrupted by areas

Figure 30.

Wellington

Base map: Nanaimo sheet, Dept. of
National Defence, 1941.



WELLINGTON, B.C.

0 $\frac{1}{5}$ $\frac{2}{5}$ mi.

- | | |
|--------------------|---------------------|
| ① Railroad station | ■ F Commercial farm |
| ② Water tower | ■ B Bakery |
| ③ Diesel oil pump | ■ H Hotel |
| ④ Round house | ■ St Store |
| ■ SM Sawmill | ■ G Garage |
| ■ S School | ■ + Church |
| ■ FH Fire hall | ■ Home |
| ---+--- Railway | □ Cemetery |
| — Island Highway | — Secondary roads |

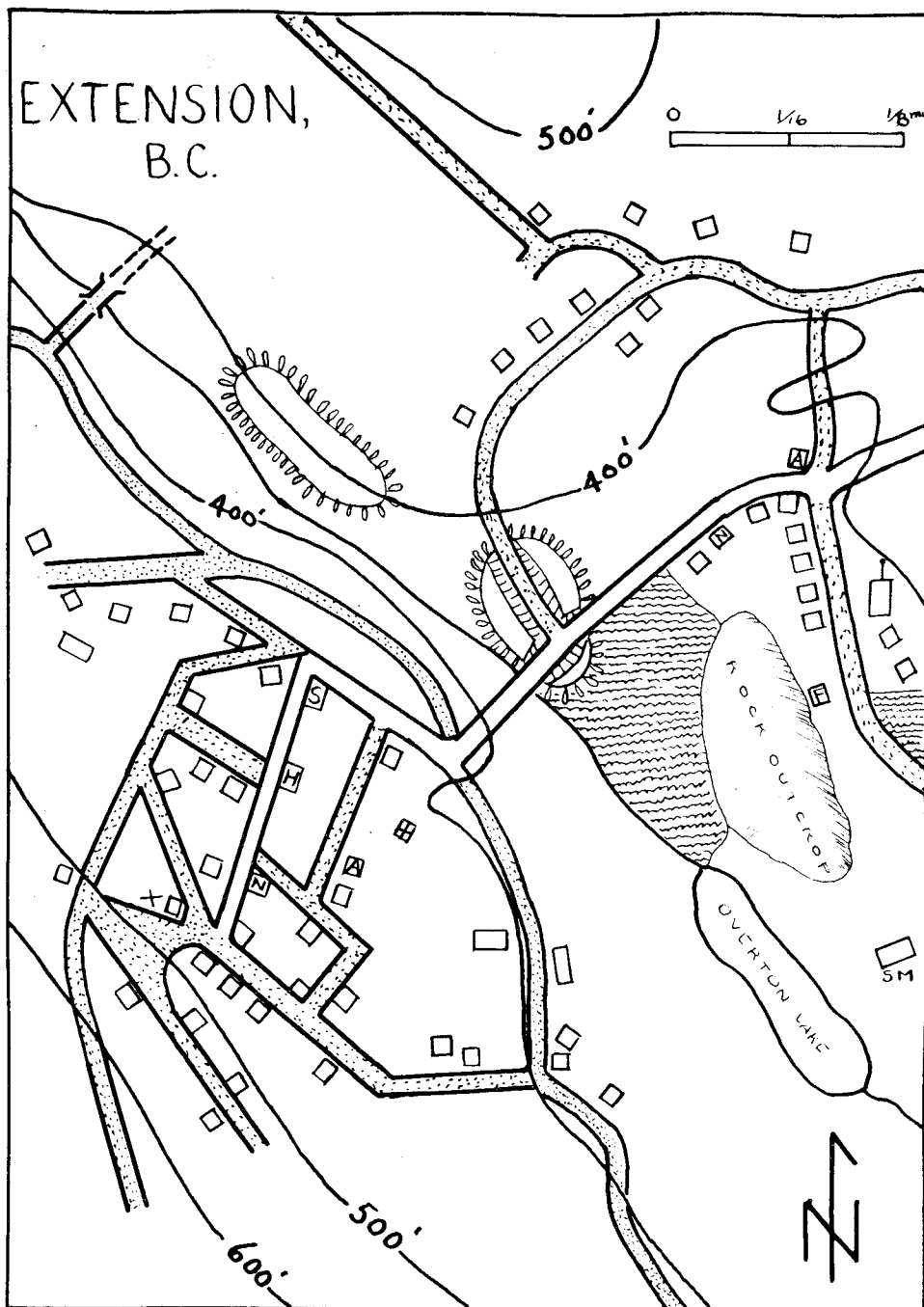
Figure 31.

Extension

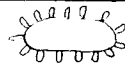
Base map: Nanaimo sheet, Dept. of
National Defence, 1941.

EXTENSION, B.C.

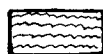
0 1/16 1/8 m



- A Abandoned house
- H " hotel
- ⊞ church
- + Church
- S Store
- SM Sawmill
- ⊞ New house
- ⊞ Abandoned school



Mine dump



Cultivated land



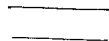
Commercial farm



Houses



Gravelled road

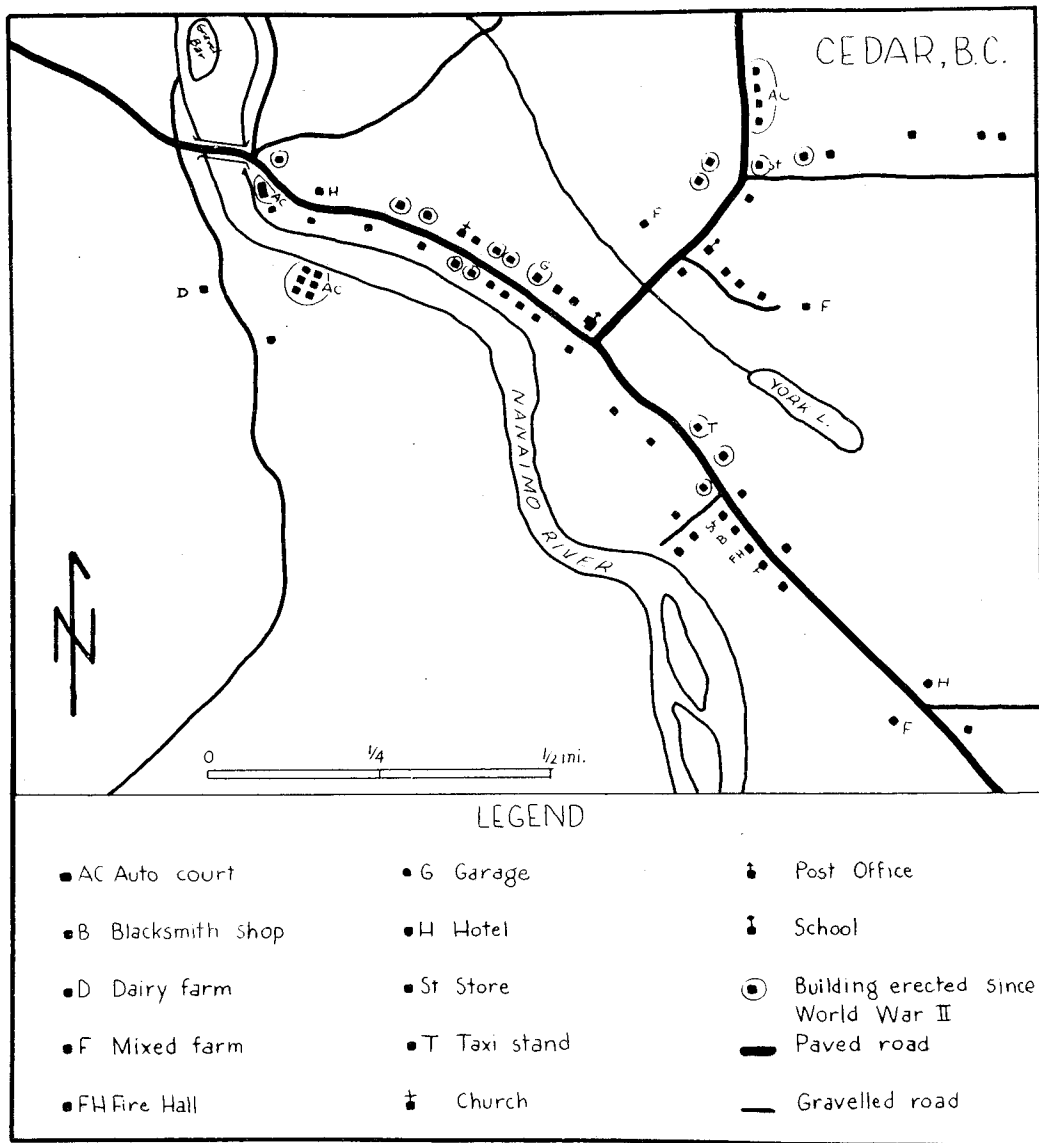


Paved road

Figure 32.

Cedar

Base map: B.C. Forest Service, 1937.



devoted to full time and part-time farming. Since then, new houses have tended to fill up the existing spaces and have also been built along the road to the pulp mill which joins the highway in the centre of the settlement. Cassidy, in its new location, and South Wellington have developed on this pattern also, but are perhaps even less compact than Cedar. Since Departure Bay has been developed as a resort and residential area, its pattern is linear along the curving shore of the bay.

IV FUNCTIONAL AREAS

Further differentiation of the cultural landscape is made by the grouping of certain aspects of community life, either naturally or by regulation, into definite zones. These functional areas, in conjunction with the pattern of the facilities serving the community, form the functional pattern.

Within the city of Nanaimo, zoning regulations were first introduced in 1936. Similar restrictions were imposed upon an area beyond the city limits in 1948 with the formation of the Nanaimo Regulated Area in 1948. (See Figure 33). Because zoning regulations were effected following long periods of previous development, considerable deviation from the zoning pattern occurs. Furthermore, the schedules provide for areas classified as residential, commercial and industrial, in that order. No distinction is made between

Figure 33.



Nanaimo Regulated
Area

From map prepared by Regional Planning
Division, Dept. of Municipal Affairs,
Victoria, 1949.

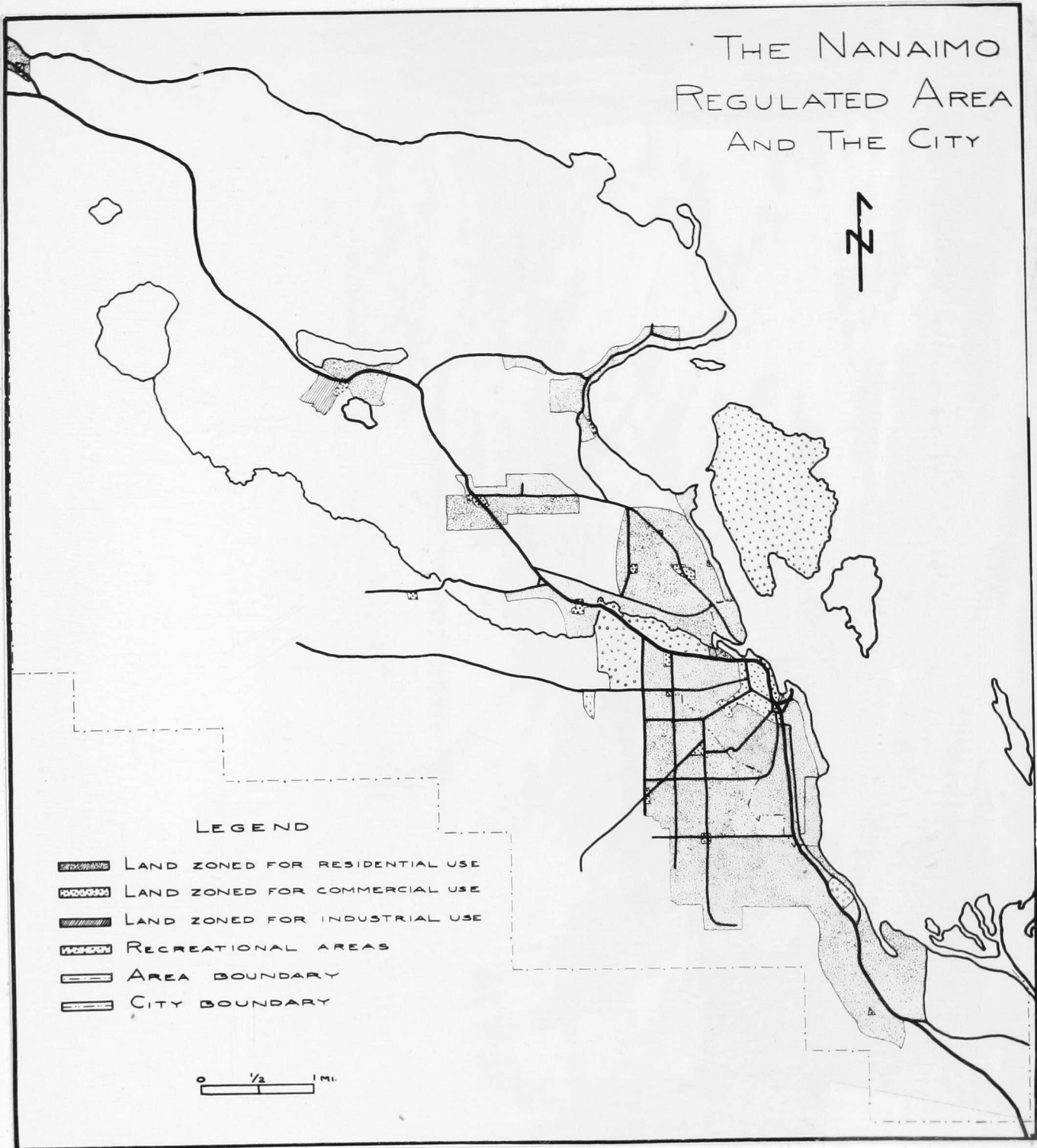
THE NANAIMO REGULATED AREA AND THE CITY



LEGEND

-  LAND ZONED FOR RESIDENTIAL USE
-  LAND ZONED FOR COMMERCIAL USE
-  LAND ZONED FOR INDUSTRIAL USE
-  RECREATIONAL AREAS
-  AREA BOUNDARY
-  CITY BOUNDARY

0 1/2 1 MI.



manufacturing and light industry. The laws exclude the latter types of development from the area devoted to the previous types, but do not exclude the first types from areas devoted to the latter. Residences can be built in both commercial and industrial areas. No regulations prohibit the residential use of land in farming areas. Before the enforcement of zoning laws, the natural advantages of certain sites had led to the concentration of allied forms of activity in fairly well defined areas within the city.

A. Nanaimo

By 1890 the pattern of the functional areas in Nanaimo was already established in the general zonation which it exhibits today. (See Figure 29, p. 154). Manufacturing was concentrated along the south bank of the Millstone River. A few manufacturing establishments had settled in scattered locations throughout the city, where some of them are still found. The waterfront from Commercial Inlet south was fully occupied by the mine offices, railway yards and shipping facilities of the New Vancouver Coal Mining and Land Company.

Immediately north were the wharves of local shipping and merchandising firms. At that time few commercial or light industrial firms had been attracted to the vicinity of the railroad station, since the freight car ferry slips at Ladysmith had not yet been established. Commercial firms were concentrated at the southern end of the peninsula and on the

opposite shore. Service establishments were found throughout the city but were more common in and around the commercial district.

Mining employees lived in all the residential sections of the city, but their homes were more common immediately west of the coal company's waterfront properties where the majority were employed. The waterfront street known as Esplanade was the site of large homes belonging to some of the mine executives.

Many prominent citizens had homes on the slopes immediately above the ravine, although industrial and commercial firms were located there as well. Newcastle Townsite was, in part, inhabited by loggers, farmers and employees of the nearby sawmill.

The present pattern of functional areas in Nanaimo is essentially the same as in 1894. The most important changes have resulted from the filling in of the ravine and the building up of the waterfront area, both of which projects were undertaken by the mining company. The waterfront has also been raised during the construction of the Assembly Wharf and of the Canadian Pacific terminal. The functional areas still occupy zones centred on the waterfront. (See Figure 34).

The plants now on the south bank of the Millstone are mainly those of metal working firms, with ship-yards on the adjacent sea-front. South of Commercial Inlet are the Assembly wharf, the transportation terminal and two sawmills.

Figure 34.

Nanaimo Today

Base map: Nanaimo sheet, Dept. of National
Defence, 1941.

Legend.

1. oil docks
2. C.P.R. Wharf
3. coal docks
4. Assembly Wharf
5. freight car ferry slip (C.N.R.)
6. small boat wharves
7. shipyard



residential areas



commercial areas



light industrial areas



industrial areas



schools



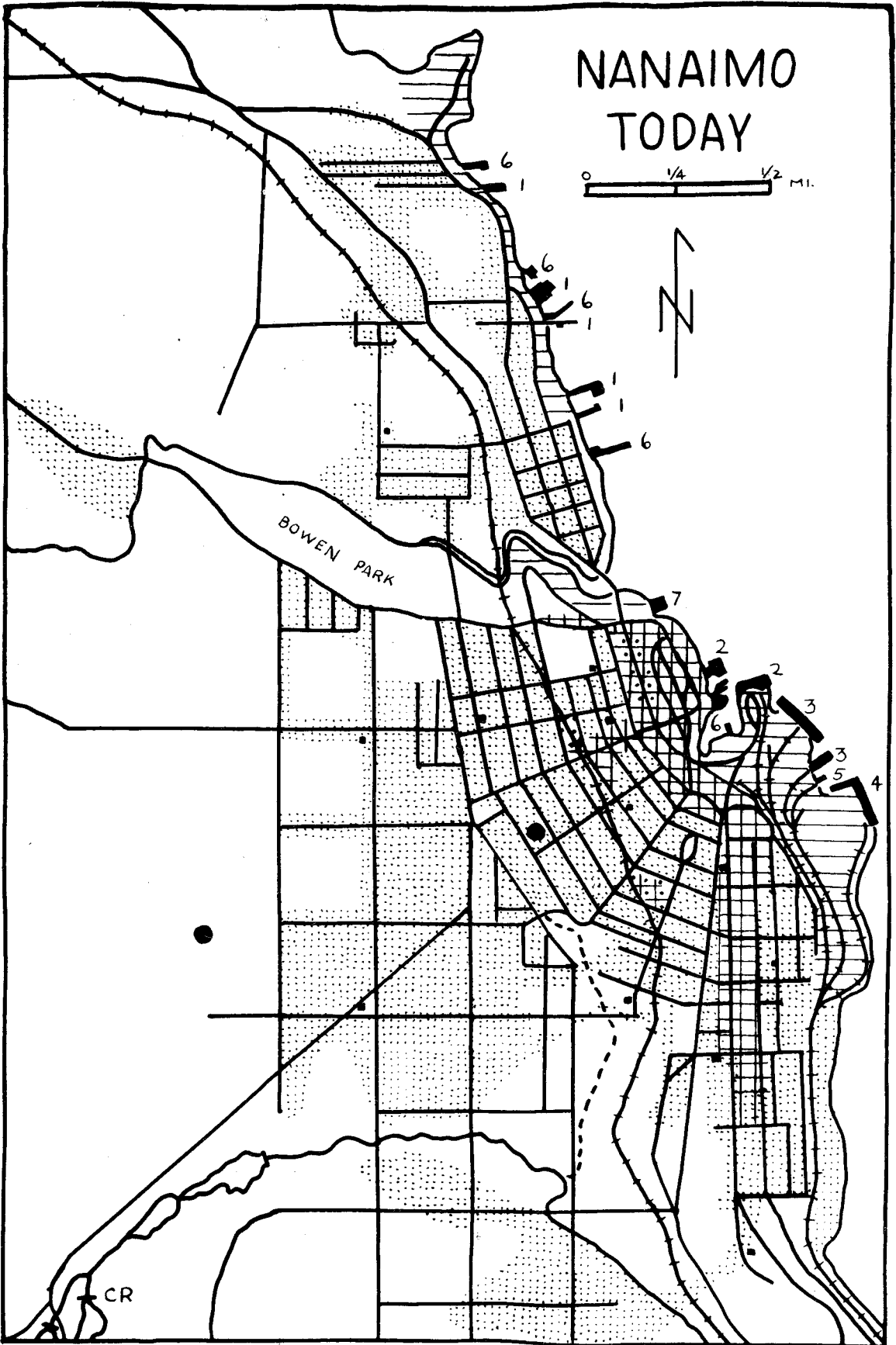
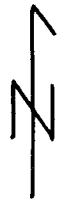
hospitals

CR

city reservoir

NANAIMO TODAY

0 1/4 1/2 M.I.



The Ravine, or Terminal Avenue, is zoned only for commercial firms and so is occupied by industrial firms which were established there before 1936. It is felt that this site might well be made available to light industry since it provides level space accessible to the waterfront in a situation which is not otherwise very attractive. Future action will probably depend on the route chosen for the arterial highway through the town. No provision apart from commercial zoning is at present made for the light industrial activity located in the vicinity of the Esquimalt and Nanaimo Railway. In Nanaimo, the concerns which have been established near the railroad include bakeries, an ice-cream plant and firms dealing in flour and feed. These companies depend upon bulky low cost raw materials which are not usually transported by rail if water-borne transport is available. In this locality, however, rail transportation is used only to convey the supplies from the ferry slips at Nanoose Bay and Ladysmith. Here, again, future zoning action may be governed by developments which may be undertaken by the railway. Scattered manufacturing activity throughout the city has continued on the sites where plant facilities were established.

The present commercial zone includes the former peninsula, the reclaimed inlet, and the lower slopes beyond. (See Figure 34, p. 164). In addition, the commercial zone extends from the middle of the town at the point where the ravine is bridged.

The heart of the shopping district is Commercial Street which formed the main thoroughfare on the peninsula. Ground floor premises are occupied by stores and other businesses, the upper floors of the buildings housing the offices of professional people, industrial and financial firms and other organizations. The side streets are similarly occupied, except that here the ground floors also may be used for office space. In this area, too, are those administrative agencies which cannot be housed in their respective governmental buildings.

On the periphery of the commercial district are those firms requiring more space for their operations, such as garages and automobile dealers, or those having a lower turnover of sales; second-hand dealers, for example. The peripheral commercial district also contains the premises of manufacturers' agents dealing in specialized goods whose customers will seek out their establishments.

Various small commercial centres, conveniently located for the residential areas, have been provided in the zoning plan, but there are many businesses, established before 1936, which do not conform to this pattern. Most of these are small confectioneries and "corner stores" but there are also some long-established firms which do a substantial business. These are found along the main streets radiating from the city centre.

The residential area occupies the remainder of the city, and as has been seen, considerably beyond. Within the city itself, there are few vacant lots now available. The effect of the mining economy on the residential pattern remains for the southeast part of the city still has many small homes on narrow lots. Large first-class homes are now concentrated in Townsite, across the river, but new first-class residential areas are generally being developed outside the city limits. Most of the residential area is occupied by second-class homes of middle-income group families. Many of the former large homes in the city have now been converted into multiple dwellings. Older residences of all types exist in the zones now classified as industrial or commercial areas.

Numerous small parks are located in the city but most of them are children's playgrounds. All area functioning as recreational centres with the exception of sports grounds, lie outside the city. Bowen Park, on the Millstone, is most accessible. (See Figure 34, p. 164). Beaches in the immediate vicinity are unattractive and the residents go to the beaches at Departure Bay or on Newcastle Island.

Administrative functions in Nanaimo are centralized, to some extent, on Front Street, in the northeastern part of the commercial district. The Court House, containing some of the Provincial Government agencies, and the Post Office Building, housing many of the Federal offices are both located there. Forthcoming expansion is planned for both centres. The new

City Hall will be located just off Wallace Street, on the slope beyond the ravine.

The majority of the service institutions of Nanaimo are located in the oldest sections of the town: near the city centre and in the southeastern district. In that area are most of the churches and licensed hotels, and the premises of the many service clubs.

The functional areas of Nanaimo are undergoing a process of reorientation. With the opening of the new transportation terminal, much of the activity in the town is centred at the south, rather than the north end of the commercial district. Traffic routes have changed, as have the relative position of industrial areas and concerns to transport facilities, and the relative position of hotels to the incoming tourist trade. Any changes which result from this shift in activity will probably be more in the nature of modifications within the functional zones, since the new location still occupies a central position in relation to the city itself and to the area in general.

B. Other Settlements

The functional zones of the remainder of the Nanaimo area are less diverse in scope and are elementary in development. Little distinction has been made between residential, commercial and industrial zones. The laws enforced in the Nanaimo regulated area should, through time, produce a more definite pattern.

Commercial establishments are usually scattered along the main highways in the same manner as the residential areas. The Regulated Area plan calls for the formation of a centralized commercial core in each community of the Area. Industrial zones are provided beside the railway roundhouses at Wellington and along the waterfront in Brechin. A small saw-mill is at present located near the Wellington industrial area. The waterfront site, in Brechin, is occupied by the storage tanks, offices and docks of several petroleum companies, wharves and floats for fishing vessels, and sawmills. Small manufacturing plants include, apart from small sawmills, a brick plant, small boat works and a hand-loom weaving studio. The pulp-mill settlement of Harmac should become a major manufacturing centre in the area.

The pattern of the functional zones in the Nanaimo area has not yet altered greatly since the decline in coal-mining.

V. TRANSPORTATION PATTERNS

Nanaimo owes much of its present importance to its location at the juncture of two routes: the land transportation route which runs along the eastern coastal plain of Vancouver Island, and the water route to Vancouver and to some of the main trade routes of the world. The chief land routes within the Nanaimo area are thus really linear in character but, owing to the local configuration of the coast line, they appear to radiate from the city. In practice, the trans-

portation routes of Upper Vancouver Island do form a nodal pattern at Nanaimo, but the narrowness of the Coastal plain limits the westward extension of transportation routes.

The sea-route of most importance to the Nanaimo area is that across the Strait of Georgia to Vancouver. It was over this route that the largest proportion of coal has been sent since early in the twentieth century. This is the route over which flows the greatest quantity of goods and the only sea-route by which passengers reach the port. The export of lumber from Nanaimo to the world market is also made possible by this route, since ships call at Nanaimo while in the Vancouver vicinity.

The coastal movement of goods includes, as well as that between Vancouver and the port, that which moves north and south from Nanaimo. Coal, logs and petroleum probably comprise the bulk of this traffic. The movement of goods over local sea-routes probably accounts for the greater part of the goods passing through the port of Nanaimo.¹

Road patterns are perhaps the best example of the true nature of transportation routes in the Nanaimo area. The Island Highway converges on Nanaimo from north and south and passes along the main commercial streets of the city. Local road patterns show an even plainer nodal development. Most

¹ No statistics on the coastal movement of goods are available. Logs and petroleum comprise the greatest part of this movement along the British Columbia coast. To these would be added, in the case of Nanaimo, the cargoes of coal moved by barge and scow from the port.

of the locally divergent roads were originally constructed to outlying coal-fields. These include the section of the Island Highway which leads to Wellington, the Jingle Pot Road to East Wellington, and the Harewood Road. (See Figure 27, p. 151). The highway through Cedar District was also constructed from Nanaimo because of the early farming development in the vicinity. Topography has governed the detailed course of roads in the Nanaimo area, but the pattern of converging routes on Nanaimo is visible throughout, even in localities which are closer to Ladysmith than to Nanaimo. (See Figure 35).

The Nanaimo area has air route connections with Vancouver and Victoria. The airport is near Cassidy. (See Figure 35.)

The Assembly Wharf and the Canadian Pacific Railway terminal form the nucleus of the present transportation pattern. The wharf handles outgoing lumber and incoming heavy freight. The Terminal centralizes all land routes, with the exception of the railway. If railway facilities should be located there, all forms of transportation in upper Vancouver Island, with the exception of coastwise shipping and air traffic, would have centralized facilities in Nanaimo.

VI HOUSE TYPES

The houses in the Nanaimo district are not, in general, greatly different from those of any other part of the British Columbia coast. There is, however, a decreasing proportion

Figure 35.

Functional Patterns

Base map: B.C. Forest Service, 1937.

FUNCTIONAL PATTERNS

0 1 2 3 4 5 mi.



LEGEND

LAND ROUTES

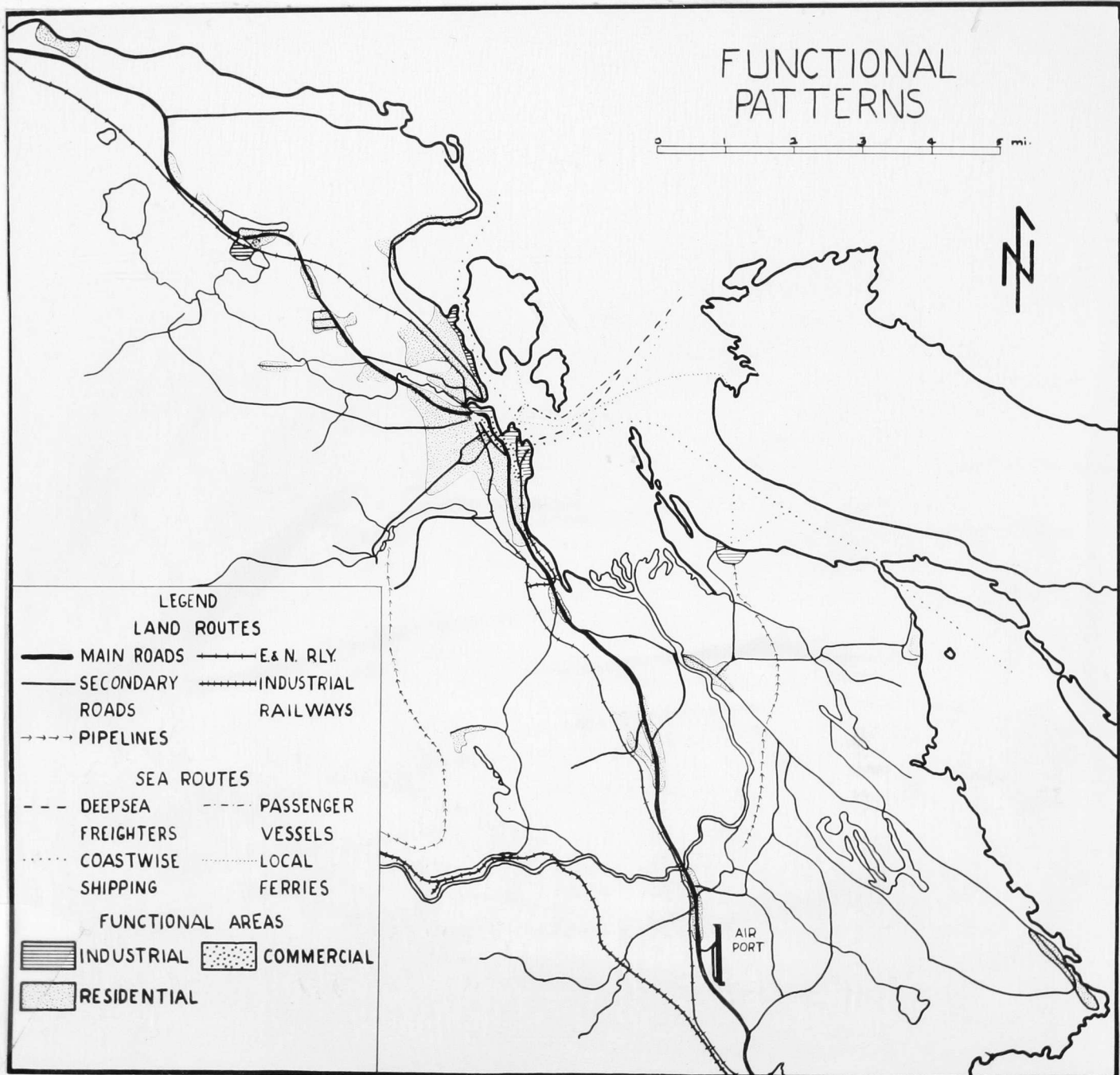
- | | |
|-------------------|-----------------------|
| — MAIN ROADS | — E & N. RLY. |
| — SECONDARY ROADS | — INDUSTRIAL RAILWAYS |
| - - - PIPELINES | |

SEA ROUTES

- | | |
|----------------------------|-------------------------|
| - - - DEESEA FREIGHTERS | - - - PASSENGER VESSELS |
| - . . . COASTWISE SHIPPING | - . . . LOCAL FERRIES |

FUNCTIONAL AREAS

- | | |
|-------------|------------|
| INDUSTRIAL | COMMERCIAL |
| RESIDENTIAL | |



of buildings which is typical of the Nanaimo area, and of the coal-mining period in particular.

A. Homes

The homes of the former mine employees can still be identified in the same localities. In those communities where homes were erected by the mining companies, such as Lantzville, rows of identical dwellings may still be found. In other communities the houses are not uniform but are all of very similar construction, resulting from the similar economic circumstances of their owners. The homes of the mine labourers are unmistakable but the owner-built homes of the middle-income employees and the mine executives are not distinguishable from those built by similar income groups in any other industry.

The homes built by the former mine labourers form the only distinct house type in the Nanaimo area. The miners could only afford to build the smallest possible houses which would shelter their families. (See Figures 36 and 37). The main part of the one-storey houses is about ten by twenty feet, usually containing two rooms. At the back is a lean-to kitchen usually not running the full length of the house, containing a window on the sidewall and the back door. The houses are of wood construction, and many have stove-pipe chimneys. In some of the outlying communities, these houses are built on small adjoining lots each with its well and outhouse. Groups



Figure 36.

Home of the mining period,
Wellington.



Figure 37.

Home built during the
mining period - Extension.

of houses of this type are to be found in the Dunsmuir settlements of Wellington, South Wellington and Extension, while a few scattered examples are to be found in Northfield, East Wellington, Chase River and Nanaimo itself. A few of these miners' homes have been renovated in recent years. Some have been painted, some have had as many as two additional lean-tos built behind the original kitchen, or have had porches added in front. Most of such homes, however, are still in their original plain unpainted condition. They were probably built by the low paid immigrant workers.

Other types of homes dating from the mining era are much less distinctive. The census of 1921 lists 501 dwellings in Nanaimo and suburbs, nearly 25 per cent of the total, as being in connected rows or terraces.¹ Today there is no trace of these homes. Before World War II, the mining district of Nanaimo contained many homes that were in poor repair and in need of painting. Short rows of identical houses, built for renting to mining families, were also common. Since the war, many of these homes have been replaced by small modern houses, or have been completely renovated and painted. Post-war improvement in the upkeep of homes is most noticeable throughout the city and the area as a whole.

The homes built by the various nationalities among the mining people exhibit certain distinct tendencies, but cannot be classed as separate types. The neat, plain homes of the

1. Census of Canada, 1921, vol. 3, p. 11.

Finnish people of Chase River give an air of prosperity to the community. The "sauna" or steam bath-house, which formerly was seen in almost every yard has nearly disappeared since the installation of household water systems. (See Figure 38). The homes of Italian people are distinguished less by the type of houses than by the excellence of their gardens.

B. Other Houses

Throughout the Nanaimo area buildings of all kinds have one feature in common: many of them are at least twenty years old or date from the recent post-war period. The explanation lies in the history of the coal-mining industry. The decline in production, and the depression, so affected the prosperity of the whole community that the citizens could not afford to build new homes, business firms could not replace or modernize their premises, and the city could not afford to replace old buildings. The present City Hall was built as the Mechanics Institute Hall in 1864,¹ (See Figure 17, p. 85), but a new building is under construction. The same condition applies to the schools in the area. (See Table XV).. Many of the rural schools were built with provincial assistance in the 1920's but none at later dates, probably a reflection of the declining rate of population growth. However, within the city itself no new schools were built from 1900 to 1947. Since then, four new schools have been constructed in the city

¹ McKelvie, B.A., Vancouver Daily Province, May 21, 1949.



Figure 38.

Finnish home, Chase River.

The "sauna", or steam bath stands to the left of the house at the rear.

TABLE XV

DATES OF SCHOOL BUILDINGS IN THE
NANAIMO AREA¹

	Date
Middle Ward (Nanaimo)	1880
North Ward (Nanaimo)	1896
South Ward (Nanaimo)	1896
John Shaw Senior High School (Nanaimo)	1898
Mountain (East Wellington)	1898
Northfield	1911
Harewood (Five Acres)	1914 (addition
South Wellington	1919 1923)
John Shaw Junior High School rebuilt	1921
Lantzville	1921
North Cedar	1922
Brechin	1927
Nanaimo Bay (south of Nanaimo)	1929
Pauline Haarer (Nanaimo)	1948
Princess Royal (Nanaimo)	1949

In process of construction, 1950

Nanaimo	1 school
Wellington	1 school
Chase River	1 school
Harewood	1 school

1. Information supplied by office of Inspector of Schools, Nanaimo.

and its suburbs and two in the surrounding districts. A large new high school unit is to be built to serve the whole area. Several rural schools have been closed in connection with the operation of the local consolidated school district.

The decrease of building operations over the readjustment period is partly evident from the value of annual permits issued by the City Engineers office from 1921 to 1949. (See Figure 39). The remarkable increase in building in the post-war years is an indication of the renewed activity of the district. The value of building permits issued in the Nanaimo Regulated Area from March 12, 1949 to December 31, 1949 totalled nearly one and one quarter million dollars.¹ (See Table XVI). From the types of buildings erected, the importance of the distribution and service industry can also be judged.

Directly or indirectly, coal-mining has had a profound effect upon the cultural landscape of the Nanaimo area. Many of the man-made features which are distinctive of the area are in some way related to the coal-mining industry.

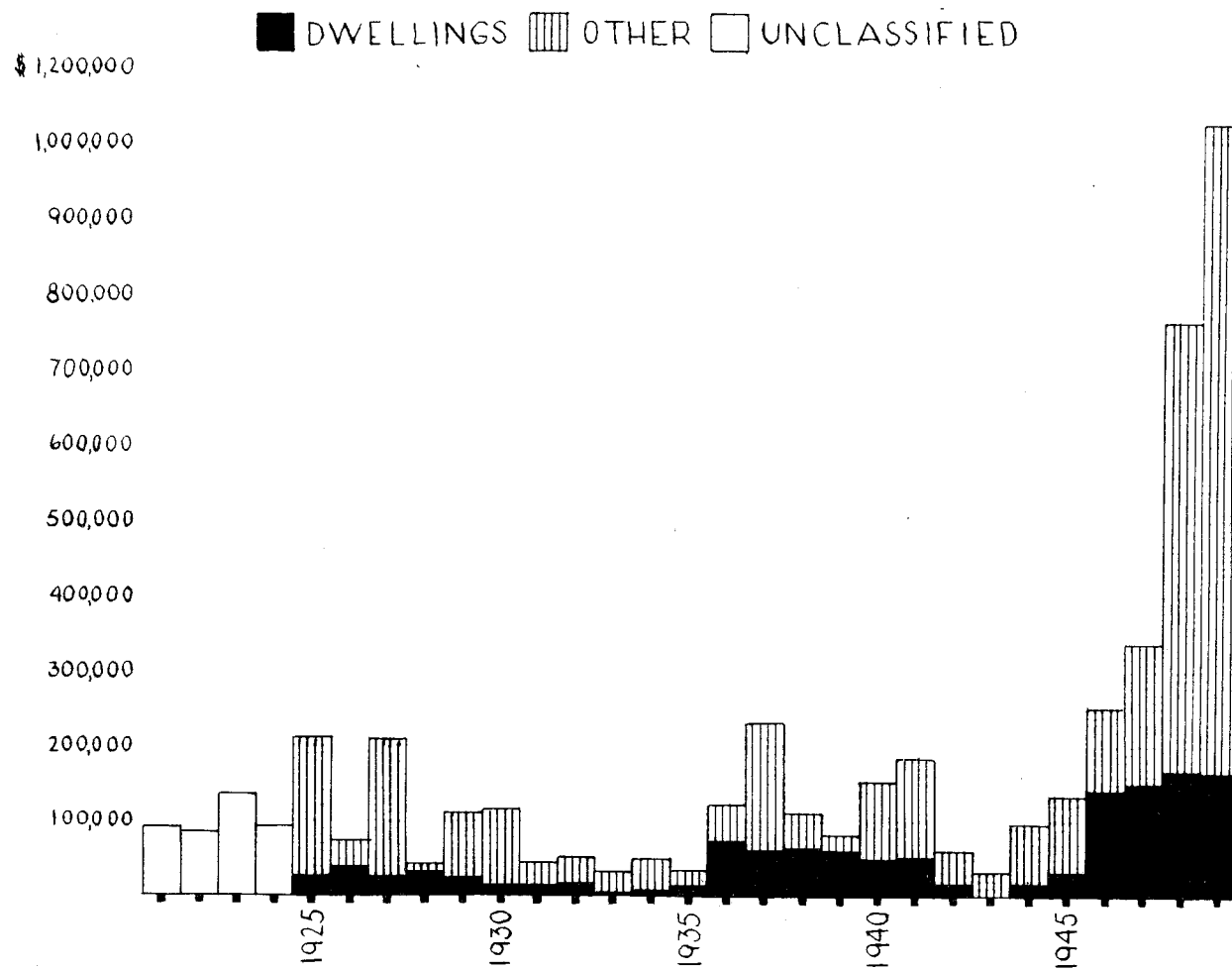
Features on the cultural landscape directly concerned with coal-mining are few and rapidly disappearing. The landscape patterns established during the coal-mining era are still visible, however, and exert a continuing strong influence upon community life.

¹ Nanaimo Free Press, Feb. 8, 1950.

Figure 39.

Building Permits

From figures supplied by office of
City Engineer, Nanaimo.



BUILDING PERMITS ISSUED BY THE OFFICE OF THE CITY ENGINEER
FIG.39

TABLE XVI

BUILDING PERMITS ISSUED IN THE
NANAIMO REGULATED AREA,
March 12, 1949 to December 31, 1949.¹

Type	Number	Total Value
Private:		
homes	175	\$ 996,900
garages	72	27,075
workshops	<u>7</u>	<u>4,850</u>
Total	254	1,028,825
Public:		
offices	2	3,200
tourist camps	2	25,000
tourist camps (additions)	5	28,000
stores	3	9,500
bowling alley	1	6,000
greenhouse	1	10,000
service station	1	8,000
drive-in theatre	<u>1</u>	<u>70,000</u>
Total	16	\$ 159,700
Grand Total	270	\$ 1,188,525

1. Nanaimo Free Press, Feb. 8, 1950, p. 1.

CHAPTER VII

POPULATION

The mining industry has deeply affected the lives of the people in the Nanaimo area. Its expansion first attracted many of them to the district, but its vicissitudes caused some to leave. The industry controlled their material prosperity and living conditions and intangibly influenced their thinking. Ever since its decline in importance, coal-mining has modified the adaptation of the people to the new economy which has succeeded it.

I POPULATION GROWTH

The progress of population growth has been like that of the progress of the coal-mining industry itself. A slow beginning was followed by a short period of rapid growth. After this came a period of near stagnation; a longer span of years during which population increased more slowly and finally declined. This declining trend has not continued, however, but has begun an upward swing which may prove to be the start of a second period of rapid population growth. This last period of population increase coincides with the time when the community turned away from coal-mining to find new resources for exploitation.

No accurate figures of actual population can be given for the Nanaimo area. The Canadian Census gives the population of the city itself and that of the suburbs, Chase River, Harewood, Brechin and Departure Bay, for some years. Estimates of population in the smaller communities have been made from time to time in the British Columbia Directories. Beginning with these figures as a basis, and checking with the number of miners employed in various pits, an estimate of population growth has been made. (See Figure 40). Its value more probably lies in the relative totals of population at various times rather than in the actual quantity of the totals themselves.

The size of the population of Nanaimo during the period of operation by the Hudson's Bay Company was commensurate with the scope of its mining activity. Increases in population probably occurred in two spurts during the following years, in 1861 and thereafter, when the Nanaimo mines expanded, and about 1871, when the Wellington mines commenced production.

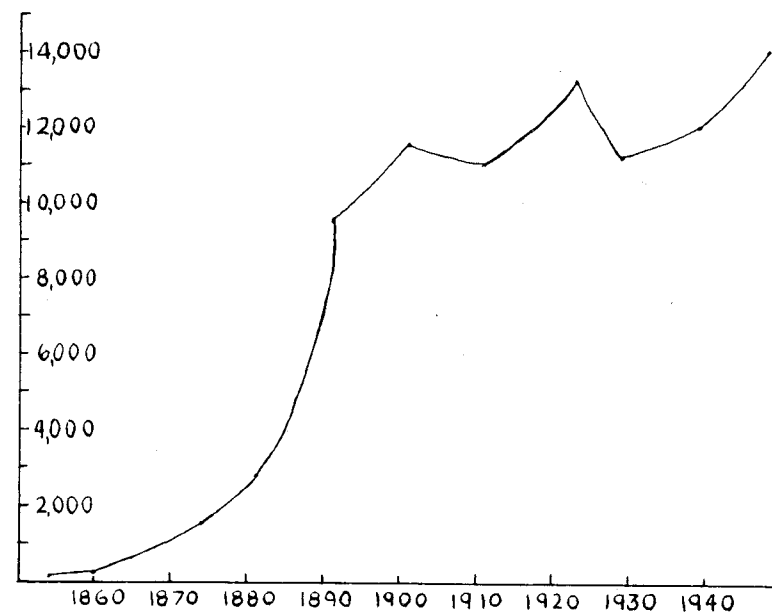
Even so, the first census taken in the area reported fewer than 3000 people in the "Nanaimo - Noonas Bay" area.¹

The decade 1881 to 1891 was one of rapid increase in population, in keeping with the increase in production and employment, and with the expansion of operations into new fields. Not even in the recent post-war period has such a rapid rate of population growth obtained.

¹ Census of Canada, District 91 a., 1880-81.

Figure 40.

Data from census and
directories.



APPROXIMATE POPULATION GROWTH OF NANAIMO AREA — 1854 TO 1948

FIG. 40

The difficulties encountered by the industry in the years following 1891 are reflected in the rate of population increase. No immediate decline ensued, but the rate of increase constantly slowed down. The apparent decrease from 1901 to 1911 was actually due to the movement of the miners employed in the Extension pits to Ladysmith.

The city of Ladysmith was established as the shipping point for the Extension field which commenced production in 1898. By 1902, it had also become the residential centre for the Extension miners and was incorporated in 1904. The city functioned as part of the Nanaimo area as a shipping point, residential area and transfer point between rail and water transportation routes. As a result of decreasing employment in the Extension mines and the development of new fields, the population of Ladysmith declined sharply before the census year of 1921. When, in 1929, the Extension mine closed, its connection with the mining industry virtually ceased. During the time, prior to 1929, when the population of the Nanaimo area was dropping, the population of Ladysmith had begun once more to increase. Logging was beginning to replace mining as the main concern of the people. Some years before World War II, Ladysmith became a logging centre for a large lumber milling firm. The economic existence of Ladysmith is now almost completely divorced from that of the Nanaimo area. Its last functional link with the area, the freight car

transfer point, is actually a manifestation of geographical inertia.

The population of the Nanaimo area, which had remained fairly stable during the previous thirty years, was not able to resist the steady downward trend in coal-mining after 1923. For the first time, sufficient numbers of people left the area to cause an actual decline in population.

The general economic recovery of the late 1930's, coupled with a partial revival in the coal industry itself, changed this trend within a few years. It was, however, probably the increasing activity of the distributing and service industries which prevented the population increase from being merely temporary. These industries were greatly stimulated by developments during the war and post-war years, resulting in an increasing rate of population growth. This change in population was, for the first time, not associated with developments in the coal-mining industry. The Nanaimo area thus entered a new phase of its existence.

The relationship between population growth and mining activity can best be seen in the case of Nanaimo itself. The mines operating within the city and in its immediate environs have all been those of the Western Fuel Corporation and its predecessors (Vancouver Coal Company, etc.). The employees of this company first settled the communities of Harewood, Northfield and Brechin. Because of the company policy of

transporting many of its men from the city to outlying mines, however, its employees have formed the major part of the mining population within the city. It is probable that the numbers of Western Fuel Corporation employees living outside the city has been somewhat offset by those of other companies living within it. The total number of Western Fuel Corporation employees, therefore, should be fairly indicative of the number of people living in Nanaimo who have been directly engaged in mining.

In order to show, approximately, the resident mining population rather than the annual fluctuations in employment, the number of miners for each census year has been taken as the average for the preceding ten years. Where complete figures are lacking, the figure used has been the average number employed during those years for which statistics are available. (See Figure 41).

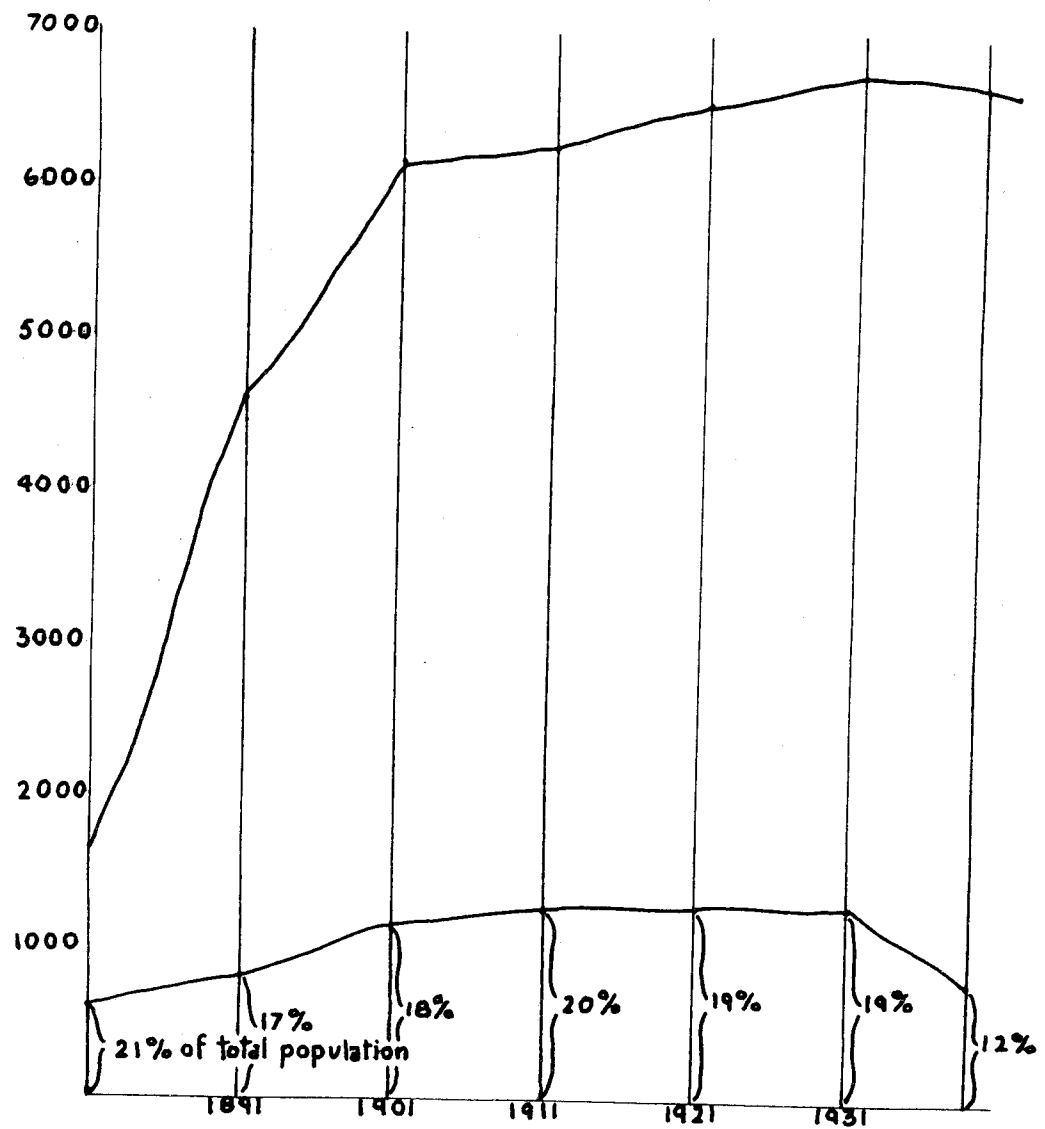
When mining first commenced in the Nanaimo field the majority of the inhabitants were connected with the industry. In the years 1881 to 1891 the rapid increase in total population outstripped the increase in mining employment. With the re-establishment of a more stable rate of population growth, mining again came to employ about 20 per cent of the total population of the city. This proportion was maintained until shortly before the cessation of company operations in 1939.

Neither the population of Nanaimo nor employment by Western Fuel Corporation declined sharply after 1923 as they

Figure 41

Mine Employees to Total Population

From Census of Canada and Reports
of Minister of Mines, British Columbia.



Proportion of mine employees to total population of

Nanaimo

Fig. 41

did in the area as a whole. Work was suspended or abandoned in the company's outlying mines in 1929 and 1930, but employment in Number One mine on the Esplanade was maintained and even increased during some of the depression years. As exhaustion of the mine approached, employment declined and the proportion of mine employees in the city dropped even more sharply than did the total population.

The agreement between trends in total population of the city and in mining employment, as well as the fairly constant proportion of the total population engaged in mining clearly illustrates the relationship between the two. Were more accurate figures on the population of the smaller centres available, the relationship might prove even closer, since these communities offered fewer alternative opportunities.

II POPULATION DISTRIBUTION

During the coal-mining period, the pattern of population distribution was governed by the location of greatest mining activity. Because of the geological limitations of the Nanaimo coal-field few of the mines in the area lasted for any length of time. As long as there were still easily accessible reserves, however, new mines were opened up to replace depleted pits. In consequence, the mining population was comparatively mobile within the area of the field. The Vancouver Coal Company, which had settled its employees in and around Nanaimo, transported its workers to outlying mines by train,

or ferry, but its operations were more localized than those of other companies. A major shift in mining activity by the Dunsmuir company resulted in a corresponding shift in population. Movement of minor sections of the population associated with the operations of small companies was fairly frequent. In later years the use of automotive transport lessened the necessity for moving communities to the location of new pits. Even so, some of the former mining families can recall living in several different communities in the Nanaimo area.

Since the decline in coal-mining, the factors motivating the choice of home-sites have completely changed. In response to new relationships the distribution of population has altered. It seems probable, also, that the present distribution will be much more stable than in earlier years.

Until the closing years of the nineteenth century mining activity was chiefly confined to the northern section of the Nanaimo field. The largest mines were in Nanaimo itself and at Wellington, where the greatest concentrations of population existed. (See Figure 42). A small mine, employing few men, was operated by the Esquimalt and Nanaimo railway in the vicinity of what is now South Wellington. Although the original company was mining in the South Field, near Chase River, most of its employees resided in and near Nanaimo. This company was also mining at Northfield, while the Dunsmuir firm and a smaller company were operating in the Millstone Valley in the general vicinity of East Wellington. The scant

Figure 42.

Population Distribution, 1891.

Base map: B.C. Forest Service, 1937.

Each unit represents 100 persons.

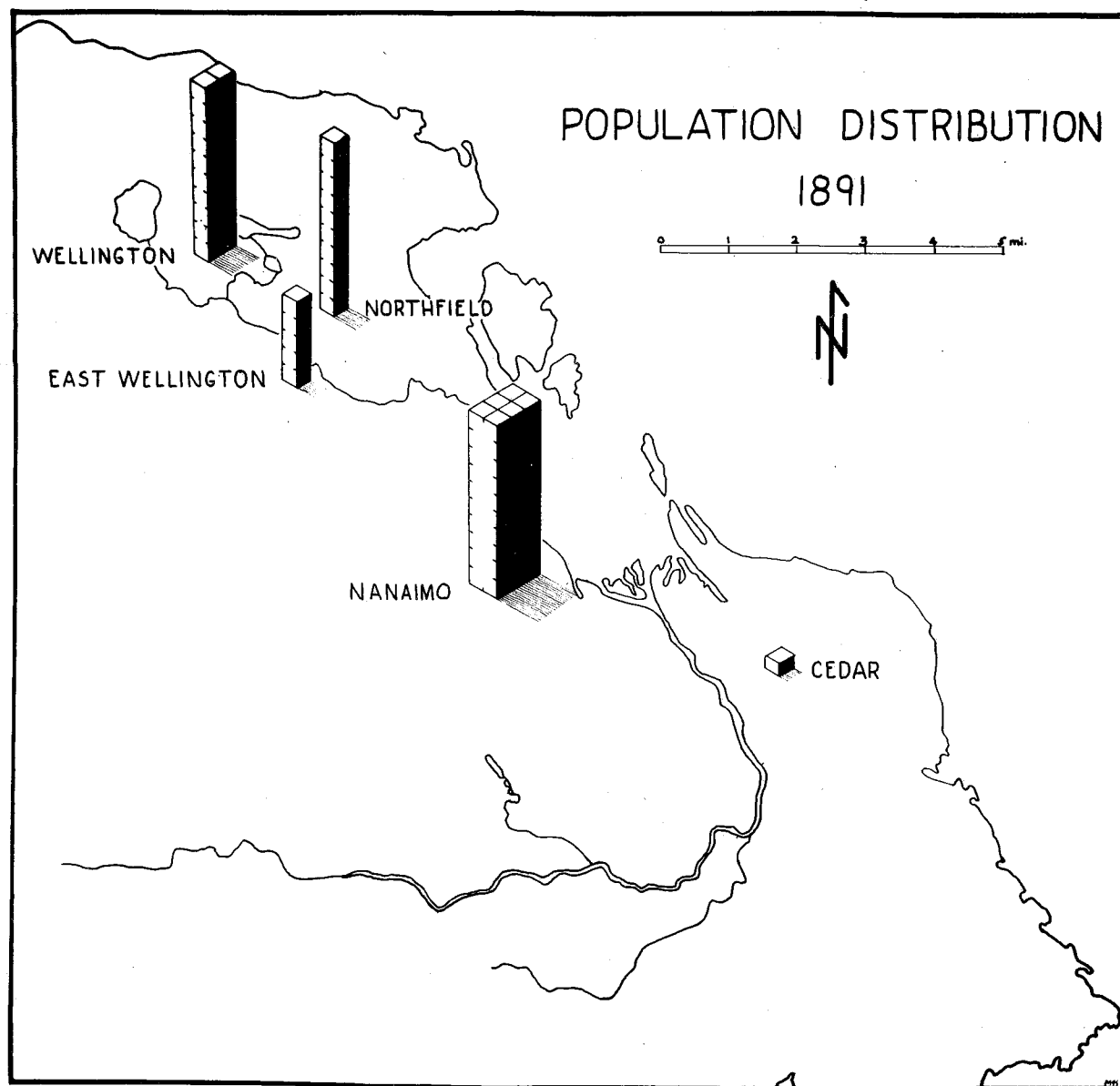


Figure 42.

population of the southern section was composed of isolated farming families.

At the beginning of this century the population of the outlying areas underwent a major change in distribution. The movement from Wellington to Extension began the trend toward the southward shift of the population. Wellington, which had been an incorporated town of 3000, lost most of its population immediately. Many of the people from the district moved to Extension which was reported in 1901 to have a population of 2500.¹ In this year the population of Ladysmith, the newly-established shipping point, was about 750. The expanded operations of the Alexandria mine at South Wellington by the Dunsmuir Company firmly established the southern section as a major coal-mining area.

The population distribution of 1901 was, however, only temporary. The isolated community of Extension proved less attractive than Ladysmith and by 1902 many of the miners had moved to the coastal town. Ladysmith was incorporated in 1904 and by 1911 it was the home of over 2500 people.

A new mine in the northern section was established at Pimbury Point in 1904. However by 1911 only a few people were settled in the Brechin district immediately north of Townsite. Beyond Nanaimo itself, population was still concentrated in the southern half of the area. In 1923, when coal-mining activity was at its height, mines were operating throughout most of the area, but the largest centres were still

1 B.C. Directory

in Nanaimo and the field to the south. (See Figure 43). The South Wellington, Extension and Nanaimo mines were still producing as before. Two new centres of mining and mine population had developed. In the north, the small company town of Lantzville had been established on the south shore of Nanoose Bay. However, most of the employees of this mine were transported to work from Nanaimo. The new Cassidy mine was one of the largest in the area, and in 1923 Cassidy was the largest of the outlying communities. (See Figure 43).

During all these years, the scattered farming population was increasing, but none of the non-mining communities had produced villages of any size.

The villages established during the coal-mining period form the basis of the present pattern of population distribution, but the actual distribution has undergone change. This change arises from the relationships in the economy. When the main activity was coal-mining, the population was situated where the coal could be mined, regardless of the attractiveness or accessibility of the location. Today the main concern is the activities centred in the city. By preference and through lack of space within the city limits, a large proportion of the people employed in the city live beyond its boundaries.¹ They have built attractive homes and many keep a few livestock. For

¹ The present population of the Nanaimo area is estimated to be about 14,000 of which 7,200 are people residing within the city limits and 4,200 are people living in the immediate vicinity of the city.

Figure 43.

Population Distribution, 1923

Base map: B.C. Forest Service, 1937

Each unit represents 100 persons.

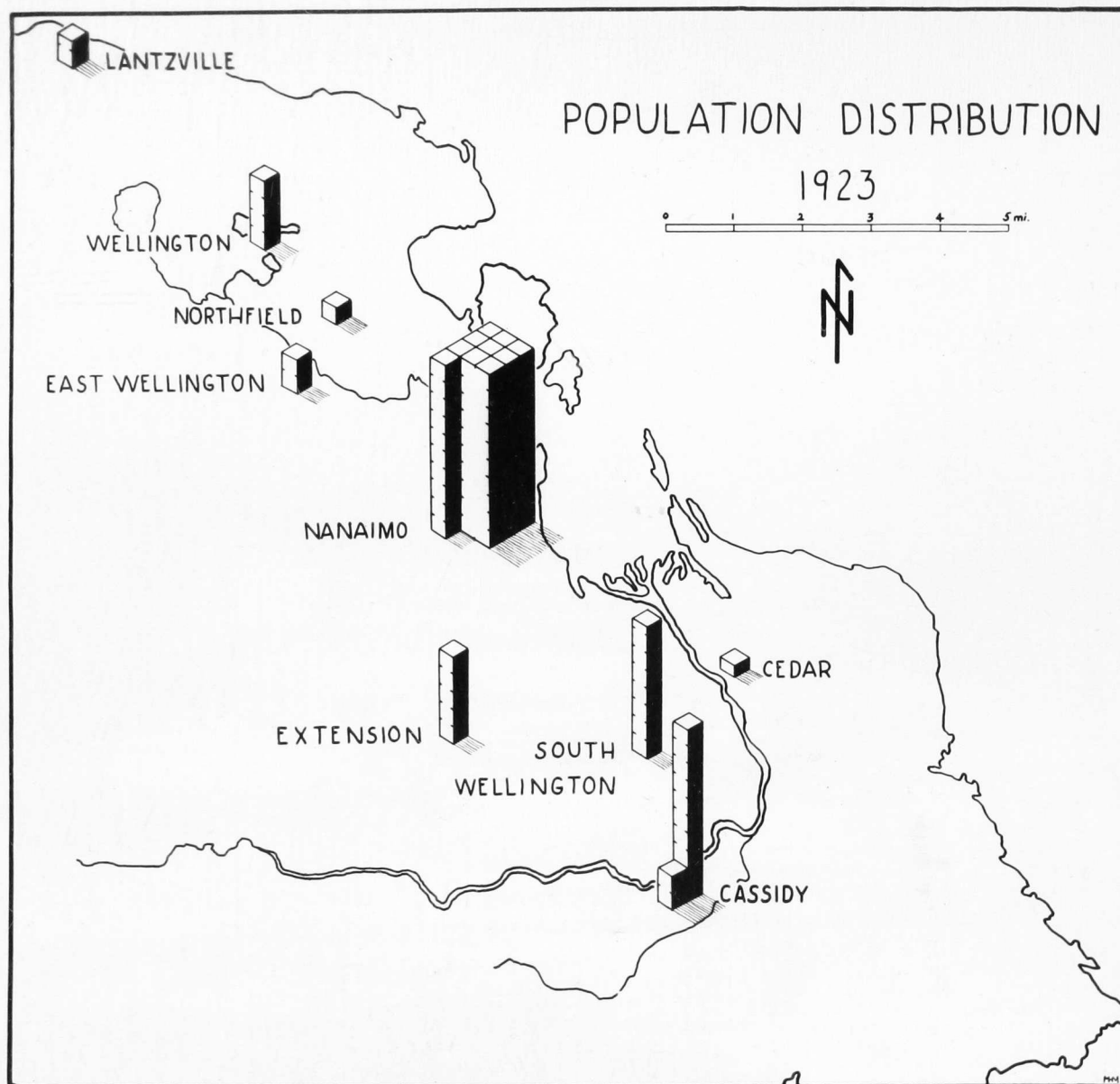


Figure 43.

these reasons, those who live in the outlying communities look for locations accessible to Nanaimo which are attractive and have agricultural possibilities.

The demand for residential space is pressing on the land in the immediate vicinity of Nanaimo. Those who use the land for crops, loggers and farmers, are forced to the periphery of the area. There is thus a zonal tendency toward sparse settlement of the periphery.

Population has partially shifted to the northern section once more. (See Figure 44). Wellington is again the largest centre beyond Nanaimo, while Northfield, Chase River and Departure Bay have also increased in size. South Wellington, still a mining centre, has decreased to a lesser extent than have Extension and Cassidy. Within the southern half of the area, population has shifted away from the mining communities to the village of Cedar. The most immediately accessible districts, Brechin and Harewood, or Five Acres, have become largely residential in character. In Harewood, this was accomplished through the subdivision of a great many of the five acre lots. Some of the most attractive locations in the area, such as Lantzville and Yellow Point, more remote from Nanaimo have developed as tourist centres.

The same natural factors which have governed the development of the area have also governed the distribution of population. Population distribution which was formerly influenced strongly by geology is now partly determined by the

Figure 44.

Population Distribution, 1948.

Base map; B.C. Forest Service, 1937

Each unit represents 100 persons.

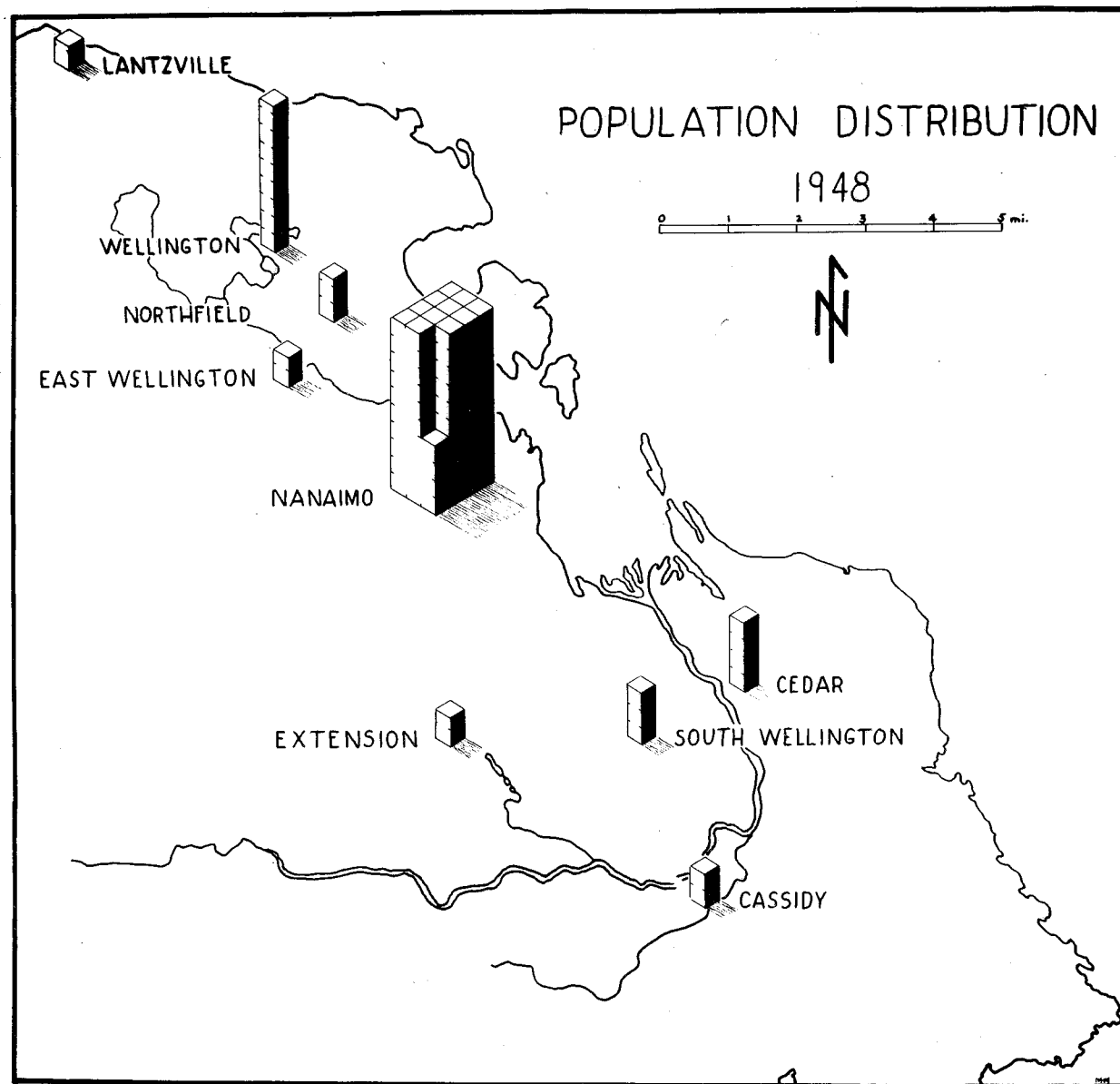


Figure 44.

relative location of villages to the main centre, Nanaimo.

III OCCUPATIONS

It is obvious that coal-mining has been the dominant occupation during the greater part of the history of the Nanaimo area but certain other occupations were pursued during the coal-mining period, notably those, as has been seen, that complemented or supported the dominant industry. Since coal-mining has declined other industries have risen to prominence.

The existing industries have expanded and new industries have made a beginning in the district.

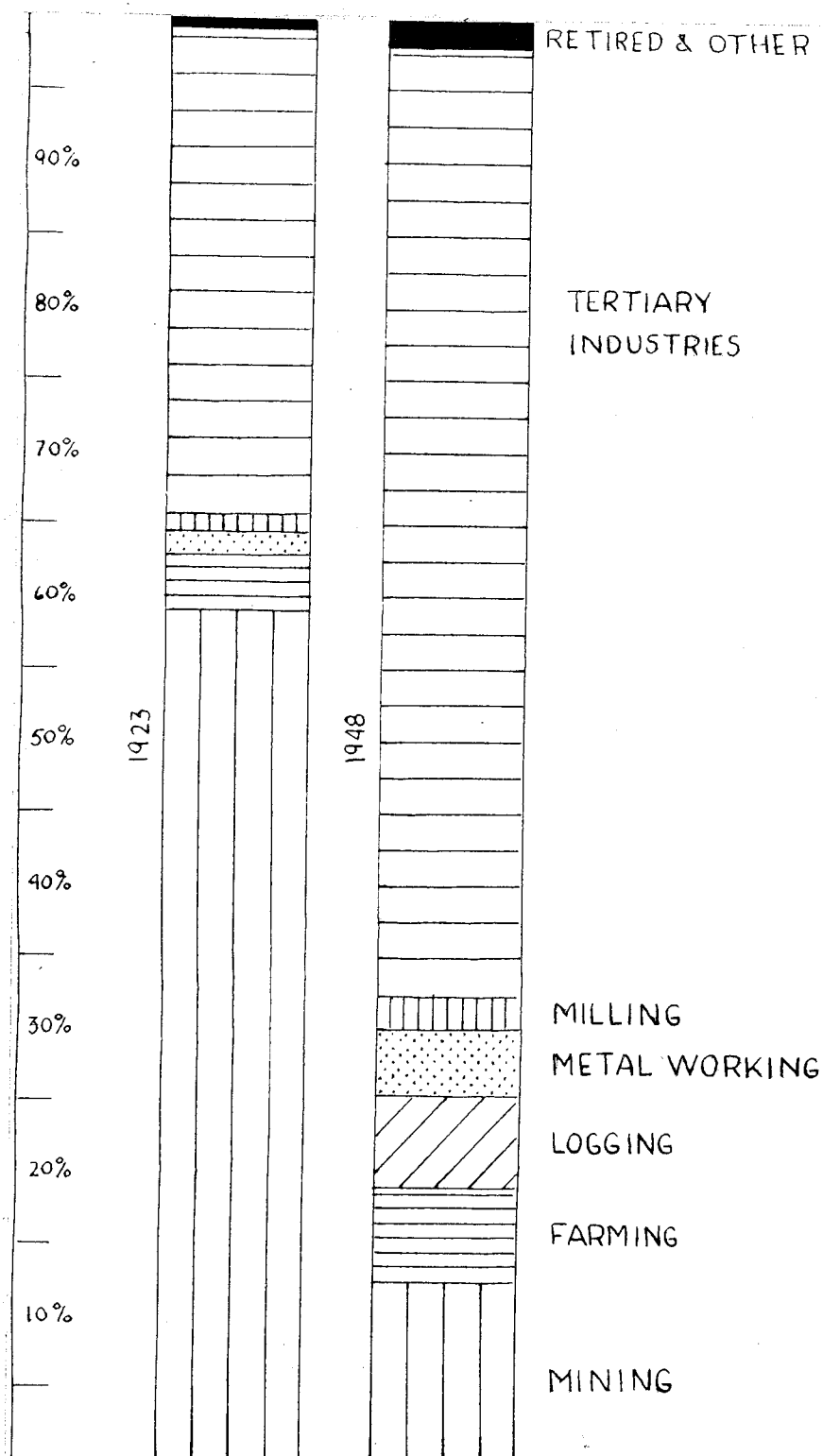
The peak year of coal-mining employment, 1923, may be taken as the one in which coal-mining was most distinctly dominant among local industry. When the figures for that year are compared with those of 1948, the implications of the change may be judged.

As might be expected, coal-mining itself was the leading industry in 1923¹ (See Figure 45). In that year 59 per cent of the people were employed by the coal-mining companies. (See Figure 45). These people, of course, represented a considerable variety of trades but all were directly supported by the industry. The other industries were developed according to their importance to the coal-mining economy. The industry of secondary importance therefore, was the non-productive

1 The figures for the following graphs have been obtained from the B.C. Directory for the years concerned. Although these sources may be inaccurate in detail, it is felt that the proportional values of occupations listed are a good indication of the existing occupational composition.

Figure 45.
Occupations.

From British Columbia Directories,
1923 and 1948.



OCCUPATIONS, 1923 AND 1948

FIG. 45

group of service and tertiary industries, employing 34 per cent of the working population. Milling was of very small importance, as was the metal-working industry. Many workers in the latter industry were directly employed by the mining companies. The only primary industry of any consequence was farming which, however, engaged the energy of only four per cent of the total working force.

The most significant changes in the occupational complex twenty-five years later were the decline of coal mining, the increase of the tertiary group of industries, and the modest increase in some of the primary and secondary industries. (See Figure 45, p. 199). In 1948 coal-mining still employed 12 per cent of the working population, with the prospect of further decline in this proportion. The service industries, on the other hand, employed 65 per cent of those gainfully employed, a greater proportion than did coal-mining at the peak of its importance. Farming employed seven percent of the workers and milling two per cent. Although the importance of logging as an occupation may decline somewhat, employment by the pulp mill should further increase the labour force employed in forest manufacturing. The metal working industries, although still not employing a large number of workers, had doubled the proportion of its employees in relation to the whole. Retirement is not strictly an "occupation", but by 1948 the proportion of the population classified as "retired" formed a small but significant group in the occupational complex.

The population of the Nanaimo area in 1923 was chiefly concerned with primary production. Today, the area is devoted in great degree to the tertiary industries.

Occupational types in the Nanaimo area

	Primary	Secondary	Tertiary	Retired
1923	63%	3%	34%	-
1948	26%	7%	65%	2%

The significant fact is that in 1923 two-thirds of the labour force was employed in the production of goods. At the present time only one-third of the working population is productive. The remainder is directly dependent upon incomes or indirectly dependent upon the productive efforts of other people.

Since the major part of the population in the Nanaimo area is concentrated in the city and its suburbs, the proportions of occupations represented in these districts are similar to those of the area as a whole. In 1923, the proportion of the labour force engaged in mining was slightly lower than in the area as a whole. The deficiency was more than balanced by the greater percentage engaged in the tertiary industries, while the other primary industries were less important. In 1948 the same complex prevailed; mining engaged a slightly lower proportion of the people than in the area at large, while the tertiary industries employed a considerably higher proportion. At both times the proportion of metal

workers in the city and suburbs was the same as in the greater area, while the proportion of mill-workers was lower. This latter fact is probably due to the location of saw-mills in the outlying districts. No figures are available regarding the number of retired people living in and around the city, but it seems probable that there are a number of such people in the vicinity.

The occupational complex of each of the communities, both during the coal-mining era and since, differs from that of the area as a whole. The differences can be traced to the available resources of the community and to its location.

In 1923 there were four communities which were engaged in coal-mining almost to the exclusion of other activities, Lantzville, Cassidy, South Wellington and Extension. No statistics regarding the population of Lantzville are available. As a "company town" of 26 houses¹ its small population was presumably supported entirely by mining. Extension, South Wellington and Cassidy each had a mining population comprising approximately 90 per cent of the working population. (See Figure 46). In Extension and South Wellington, small numbers engaged in the service industries formed the second occupational group. A few farmers lived at South Wellington, and Extension was the home of a few loggers. In Cassidy, all service workers were employed by the Granby Company, and the only other occupation represented was a little farming.

1 Report of Minister of Mines, 1920.

Figure 46.

Occupations, 1923

Base map; B.C. Forest Service, 1937.

Each unit represents 10% of the
gainfully employed population.

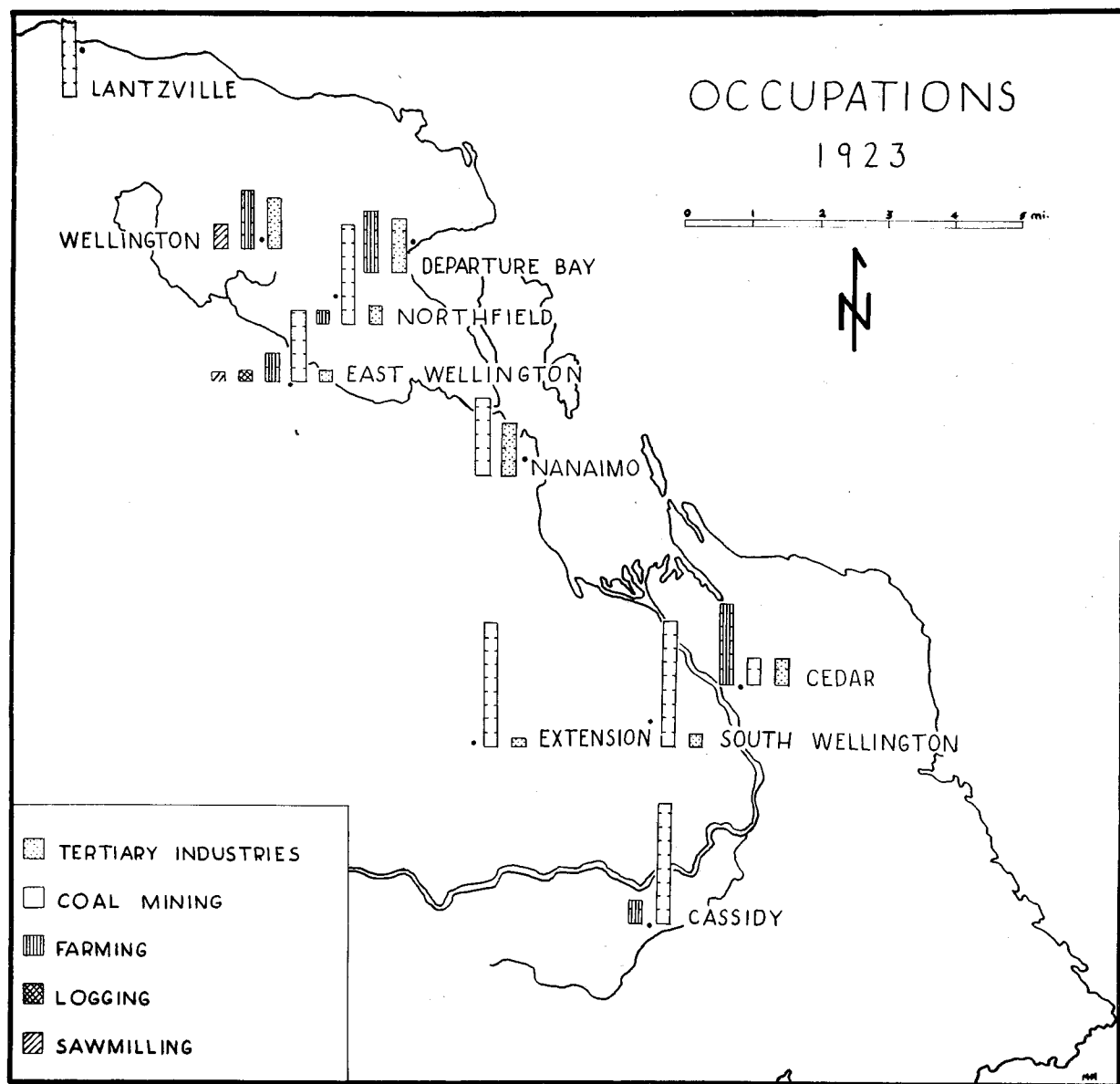


Figure 46

The adjustment made by these communities has varied with their environment. Mining on a large scale has completely disappeared from Lantzville and Cassidy, although a few people are still employed by the industry. (See Figure 47). Both communities are comparatively close to large logging operations beyond the Nanaimo area, and are in districts leased for small-scale logging. Logging and milling are important to Lantzville; logging and farming support the majority of the Cassidy residents. The service industries, represented in both localities, are most important in the sea-side village of Lantzville.

Mining is still the leading industry in South Wellington and Extension, the communities most accessible to the large-scale mines in recent operation. In both cases decrease in mining employment has been offset by the increased proportion of people engaged in logging and farming. South Wellington is near the more extensive farming areas, but Extension has access to some fertile bottom lands. Milling and the service industries have increased their proportions slightly.

Two adjacent communities, East Wellington and Northfield, have differed in their adjustment to the decline of coal-mining. In 1923 mining was the leading industry in both places, but less dominant than in the above examples. In East Wellington, on the Millstone River, farming formed the second largest occupational category, although logging, milling, metal-working and the tertiary industries were also fairly well represented.

Figure 47.

Occupations, 1948

Base map; B.C. Forest Service, 1937.

Each unit represents 10% of the gainfully
employed population.

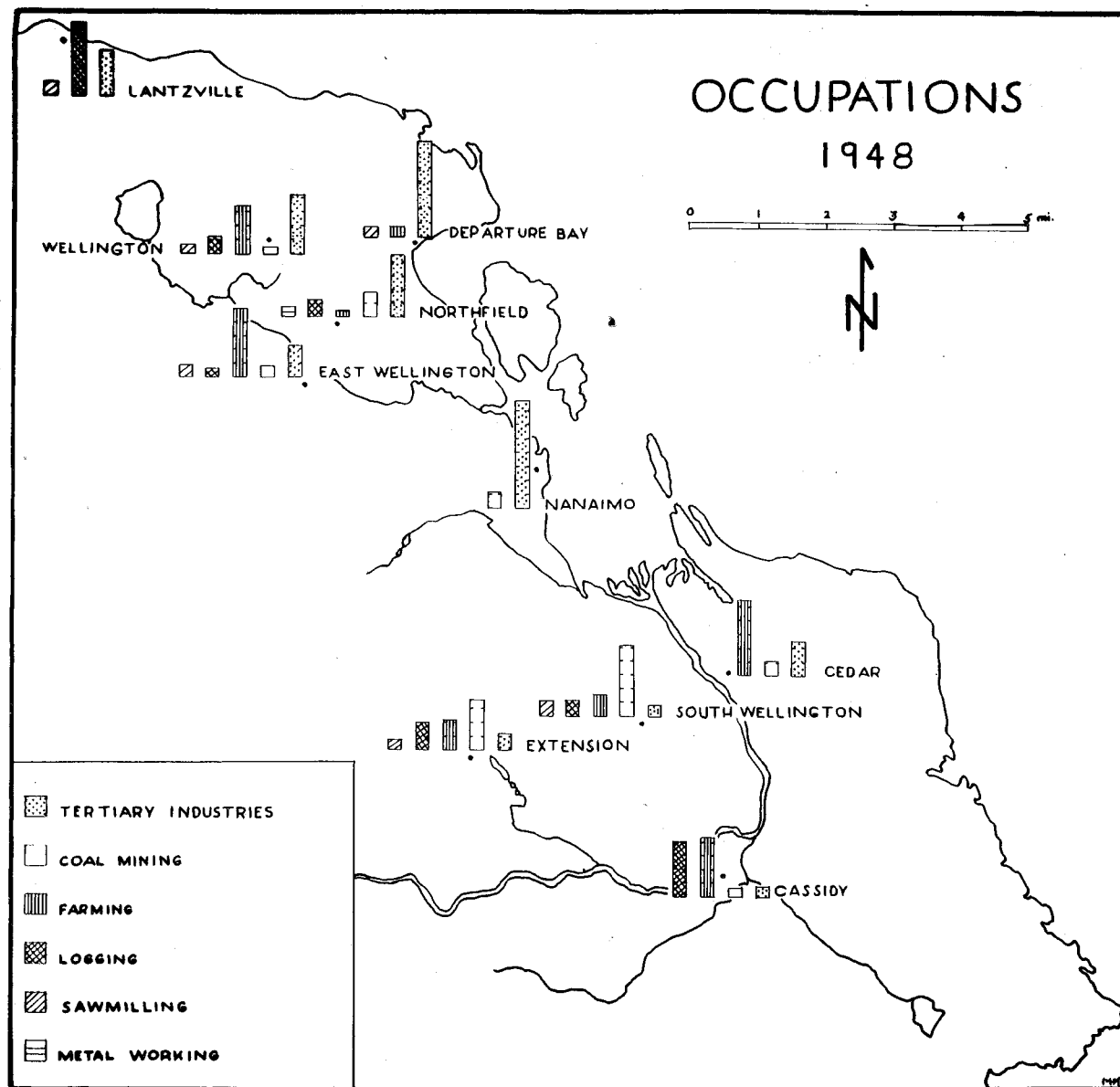


Figure 47

In Northfield, which is more accessible to Nanaimo, the service workers formed the second largest group. Farming was slightly less important, and the only other occupation, metal-working, engaged only a few people. By 1948, farming had asserted itself as the leading occupation in East Wellington, the service industries were second and the proportion of workers engaged in the other industries was little changed. In Northfield, the service industries employed nearly 45 per cent of the working population. Owing to the requirements of the small mines, coal-mining was the second industry in importance. Farming had declined in importance, but the increased proportion of mill and metal-workers pointed to the growing importance of the community as a residential site for those employed in the city.

In three communities, farming was the most important occupation in 1923; Wellington, Cedar and Departure Bay. (See Figure 46, p. 203). The latter, unlike the two former, is not located in an area of extensive arable soils and the farming group was partially comprised of market gardeners. In all three communities the service industries employed the second largest group, although the mining population of Cedar was of similar size. The residential character of Departure Bay can be judged from the proportion of retired people, mill-workers and metal workers who also resided there. The occupational complex of Departure Bay has undergone considerable change with its growing importance as a residential centre. Farming

has declined greatly, and the tertiary industries now employ 70 per cent of its working population. All the other industries of the area, with the exception of metal-working, are represented by small groups of the labour force of the community. In Wellington, also, the service industries have displaced farming as the leading occupation, although to a lesser extent. Retired people form nearly 20 per cent of the whole self-supporting group. Otherwise, only minor changes have occurred in the proportions of workers engaged in the other industries. The occupational complex of Cedar has changed remarkably little. The proportions of service workers and retired people have increased until they exceed mining in size. Mining and farming have both declined slightly, but the other productive industries have increased slightly. The lack of significant change reflects the progress of a community where less adjustment to the loss of coal-mining has had to be made, and where the impact of the spreading residential areas has not yet been fully experienced.

The increasing diversity in employment in 1923 as compared to 1948, noticeable in the smaller communities, does not obtain in Nanaimo itself. Coal mining was the leading industry in 1923, with the tertiary industries in second place. Now these positions are reversed, with the non-productive industries being even more predominant than was coal-mining. Since the population of Nanaimo and its suburbs represents the

majority of the total population, this fact indicates the lack of balance which still exists in the economy.

IV NATIONAL ORIGINS

The coal-mining industry has strongly influenced the composition of the population with regard to national origins. The labour market attracted varying nationalities throughout the life of the Nanaimo field. The history of national immigrations to the area has differed from that of the province as a whole, and the present complex of nationalities differs from that of the average Vancouver/Island city.

The proportion of different origins resident in the Nanaimo area has altered only in detail since the first census was taken in 1880-81.¹ At that time the population was predominantly British in origin, although to a lesser degree than in later years. People of continental European and Asiatic origin formed a comparatively small proportion of the population as they have ever since. A high proportion of people were of "unknown" origin and there was a greater diversity of nations represented than at subsequent periods. These two facts may

1 Owing to the variability of census districts in various years, it is not possible to give nationalities by actual numbers. The percentages for the applicable census divisions have been calculated instead. Statistics on national origins have been given for the following census divisions:
 1880-81 Nanaimo-Noonas Bay
 1911, 1921 Nanaimo and suburbs
 1901, 1931, 1941 Nanaimo city
 The census for 1891 is unavailable.

perhaps be due to the inclusion of seamen in port.¹ Changes in the population composition since 1881 have been changes in detail only of the relative proportion of United Kingdom, continental European and Asiatic people.

The three groups have played separate roles in the coal-mining industry. The first immigrant miners were experienced men from the British pits. The Reports of the Minister of Mines give the names and occupations of those who were killed or injured in mining accidents, and from these it appears that men of British origin predominated among the skilled workers. From this source, also, it would appear that continental European and Chinese were employed originally as unskilled labourers. The Chinese workers became less important in the industry in later years.

Mining, before the days of collective bargaining, was done on a contract basis. The skilled miner would contract to cut coal for the company and would employ and pay his own helpers.² Most miners employed Chinese, since they would accept lower wages than other labourers. It became the general opinion, however, that the Chinese did not take the necessary precautions when employed in an underground capacity.³ This belief is commonly held even today. Because the Chinese worked for such low wages, moreover, they tended to deprive other nationalities

¹ Two vessels were listed as "temporary dwellings" by the census.

² British Columbia, Report of Royal Commission on Coal in British Columbia, 1914, p. 11.

³ Report of Minister of Mines, 1902.

of the unskilled labouring jobs. In any event, the European miners agitated to have them removed from underground workings, and in 1907 were successful in their attempts. Since then the Chinese population of the area, comprising the greatest part of the Asiatic group, has declined in proportion to the whole.

The policy of the Vancouver Company, of bringing in British immigrant workers, was not so closely followed by the Wellington firm. The Wellington mines had a fairly large turnover of personnel and the town a more transient population.¹ In addition, the proportion of continental Europeans appears to have been higher. As early as 1875, a list of 24 fatalities in a single Wellington disaster includes the names of seven men of Italian origin.² Numerous Italian immigrants came to the British Columbia coal mines³ and today people of Italian origin form the largest single national group among continental Europeans in the area. Were figures available to show the national complex of the outlying communities where the Dunsmuir firm operated it seems probable that people of central, southern and eastern European origins would comprise a fairly high proportion of the whole.

The initial predominance of British coal-mining people has been maintained in spite of a decrease in their numbers following upon the decline in the industry. The above average

1 Williams Official B.C. Directory, 1893, p. 248.

2 Report, Minister of Mines, 1875.

3 Foerster, R.F., The Italian Emigration of our time, vol. 20, Harvard Economic Studies, Harvard University Press, 1919, p. 350.

proportion of other Europeans reflects their increasing association with the industry and their ability to adapt themselves to the demands of new occupations. The below average proportion of Asiatics reflects, in part, the tendency of the Chinese to leave the area when the demand for their unskilled labour declined in the coal-field.

Among the continental Europeans, the greater proportion are those people whose origins were in central and southern Europe: people of Italian, Czecho-Slovakian, Hungarian, Roumanian and Austrian descent. The census category "other European" probably includes those of Yugoslavian origin as well. Together, these people comprise nearly seven percent of the whole population. (See Figure 48). Nearly five percent of the population is composed of western Europeans, while the Scandinavian and Finnish people, usually associated with the logging and fishing industries, comprise only two per cent.

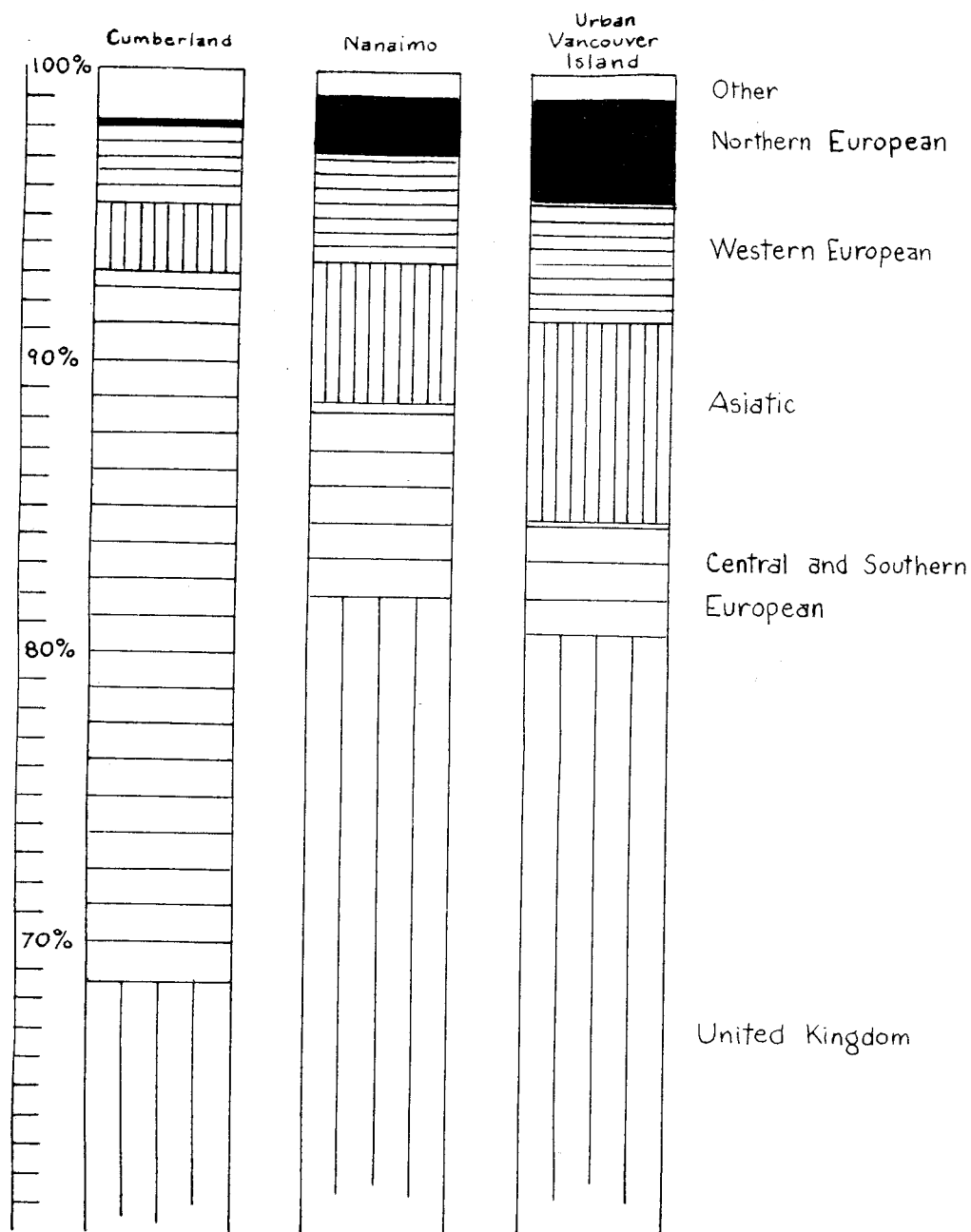
The complex of national origins in Nanaimo is intermediate between the pattern of the average Vancouver Island community and Cumberland. The latter is a small mining town (1941 population, 885) in the Comox field, where operations of the Dunsmuir firm began in 1889.¹ Cumberland is almost completely devoted to coal-mining. Its high proportion of central and southern Europeans (nearly 25 per cent) and its low proportion of northern Europeans reflects its later develop-

¹ Graham, Chas., "The problems of the Vancouver Island coal industry," Trans., C.I.M.M., July, 1924, p. 456.

Figure 48.

National Origins of Cumberland,
Nanaimo and Urban Vancouver Island.

Data from Census of Canada, 1941.



NATIONAL ORIGINS OF CUMBERLAND, NANAIMO AND URBAN VANCOUVER ISLAND
FIG. 48

ment as a mining centre and its preoccupation with the industry.

The proportions of nationalities within the broader groups have also been influenced by coal-mining. About ten per cent of the urban population of the island lives in Nanaimo. Theoretically, a similar proportion of each nationality should reside there also. However, certain nationals are of greater or lower incidence in Nanaimo than is usual. Thus there are proportionately more Scottish and Welsh people than English or Irish; more Belgian and German than French. (See Figure 49). Among western European and British groups, at least, a traditional coal-mining association may have influenced migration to the Nanaimo field. Italian nationals comprise the largest European group, in Nanaimo and Cumberland, in keeping with the general migration of these people into the coal-mining industry of North America.¹ The same predominance of British and southern and eastern European nationals found in Nanaimo exists also in the Roslyn-Cle-Elum field of Washington.²

V SOCIAL CONDITIONS

Coal-mining dominated the life of the Nanaimo area to such a degree that it deeply affected the living conditions of all the inhabitants. Some of the more material effects have already been lost, while others are quickly disappearing. Some of the intangible effects have had no less powerful results on the community and may, perhaps, be more lasting.

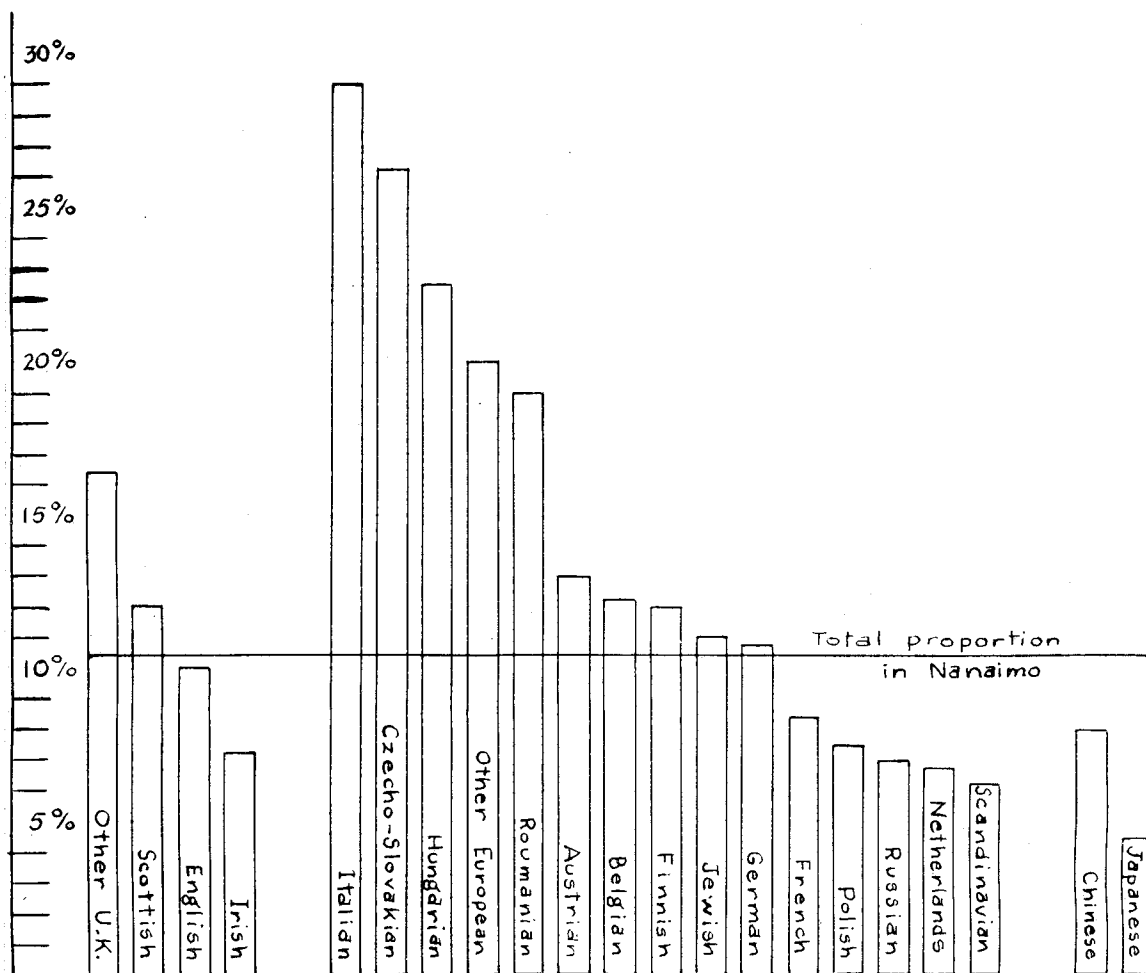
1 Foerster, op. cit., p. 350.

2 Dart, op. cit., p. 60.

Figure 49.

Proportion of Urban Vancouver
Island National Groups resident
in Nanaimo, 1941.

Data from Census of Canada, 1941.



PROPORTION OF URBAN VANCOUVER ISLAND NATIONAL
GROUPS RESIDENT IN NANAIMO, 1941

A. Living Conditions

The development of the coal-mining industry brought about an early concentration of population within the area which was dense in comparison with that in many other parts of the province. The density of population in the whole Nanaimo area is today about 150 persons per square mile. Since nearly two-thirds of the total population of the area is found within the city and the immediate districts, there exists considerable pressure upon the land for residential purposes. In the smaller communities surrounding Nanaimo, new houses are being built on lots which are sometimes nearly as cramped as in the original mining villages.

Within the city itself population pressure is extremely high. In 1941, following the decline of the depression years and preceding the increase of the war and post-war years, population density within the city nevertheless amounted to 5871.68 persons per square mile. This figure was exceeded in British Columbia only by that of Cranbrook.¹ While this density was achieved partly by the close spacing of homes and the building of "rows" it was also made possible by the building, during the mining period, of large boarding houses and other multiple dwellings. The average number of people per occupied house increased through most of the mining period and has declined sharply in the period since that time. (See Table XVII.) In the years since 1941 population density has

1 Census of Canada, 1941, vol. A. 4.

TABLE XVII

AVERAGE NUMBER OF PERSONS AND
FAMILIES OR HOUSEHOLDS PER
OCCUPIED DWELLING, 1881 to 1941.¹

Year	Persons per occupied dwelling	Families or households per occupied dwelling
1881	4.2	1.00
1901	4.8	1.01
1911	4.85 ²	1.03 ²
1921	4.4 ²	1.05 ²
1941	3.7	1.04

1. The figures have been obtained from the census for those years which provide the necessary data. Total numbers of population and occupied dwellings have been omitted because of the varying basis of the figures.

2. Averages for "Nanaimo and suburbs".

been increased by the building of new one-family homes on vacant lots and by the conversion of some of the large old homes into multiple dwellings.

While the mining industry generally accounted for the construction of many low-value homes all through the area, the policy of the Vancouver Coal Mining and Land Company enabled many people to become home-owners. The proportion of owner occupied homes compares well with the proportion in many other cities of British Columbia. However, the legacy of the mining industry can be seen in the prevalence of low-value homes. (See Table XVIII) With the renewed prosperity of recent years, however, so much renovation and new construction has been undertaken that the appearance of the residential districts is rapidly improving. In time Nanaimo should compare favourably with other towns in respect to the value of its homes as well.

The provision of water and sewage facilities in the Nanaimo area is limited by the supplies of water available. Nanaimo city waterworks are supplied by a dam situated on the South Fork of the Nanaimo River. The system supplies the city and parts of the immediate vicinity. Beyond this area water supplies and sanitary facilities must be provided by the individual home-owner. Expansion of the city facilities depends upon provision of an extended distribution system, since the supply obtainable from the present source is adequate

TABLE XVIII

VALUES OF OWNER-OCCUPIED HOMES ¹
IN SOME BRITISH COLUMBIA CITIES

	Percentage of Total Dwellings	Median value of owner- Occupied Homes
Kamloops	44.0%	\$ 2,920
Trail	49.4	2,650
Nelson	55.3	2,480
New Westminster	58.3	2,380
Kelowna	59.1	2,210
North Vancouver	60.3	1,990
Prince Rupert	41.9	1,950
NANAIMO	<u>59.8</u>	<u>1,810</u>
Vernon	54.7	1,750

1. Adapted from Table 11, Vol. 5, Census of Canada, 1941.

to meet increased demands. The formation of a Greater Nanaimo Water Board has been under discussion with a view to solution of the problem.¹ At the present time the lack of an adequate water supply is hindering residential development in such communities as Northfield.² Most of the outlying communities derive their water supply from the ground water resources and these appear to be reaching the limit of their development.

Electrification, both rural and urban, is well advanced. The B.C. Power Commission supplies all but the more remote rural areas. The city is well-supplied with telephone service, although service to rural areas is still limited by shortages of equipment and supplies.

The homes of Nanaimo contain many of the household amenities, and this situation seems fairly common in all parts of the Nanaimo area. A comparison from the census returns of 1941, of Nanaimo and Port Alberni, a Vancouver Island town of similar size, with two coal-mining centres of Nova Scotia, indicates that the British Columbia communities have a greater proportion of modern equipment in the homes of the people, and that Nanaimo is better supplied in this respect than is Port Alberni. (See Table XIX). The greater prevalence of vacuum cleaners in the B.C. towns may be due to the greater availability of hydro-electric power, and that of automobiles to the greater isolation of these two towns. However, the proportion

1 Vancouver Daily Province, "Big water system mooted," Sept. 30, 1949.

2 ibid., "Water supply urged," May 3, 1950.

TABLE XIX
COMPARISON OF PERCENTAGE OF CERTAIN
MODERN CONVENIENCES IN FOUR COMMUNITIES - 1941¹

	Radios	Automobiles	Telephones	Vacuum Cleaners	All Four
NANAIMO	<u>85.9</u>	<u>32.5</u>	<u>74.3</u>	<u>44.5</u>	<u>21.0</u>
Port Alberni	82.9	37.2	68.2	31.0	18.6
North Sydney	84.6	33.8	39.0	18.7	8.9
Sydney Mines	87.9	10.1	12.1	6.0	.7

1. Census of Canada, 1941, Vol. 9, Table 31.

of all facilities enjoyed by Nanaimo citizens indicates a fairly comfortable mode of living.

B. Working Conditions

During the coal-mining activity, working conditions were not always attractive. Coal mining was difficult and dangerous, and most of the former miners are satisfied to be out of the pits. Only at Cassidy, where the provision of excellent living and working conditions was part of company policy, is there any regret for the passing of coal-mining.

Working conditions in some industries are still hazardous, particularly logging and milling. Once again, however, the area supports, in the pulp plant, an industry which attempts to provide good working conditions.

The Nanaimo area had not completely emerged from the readjustment period following the decline in coal-mining when the census of 1941 was taken. It was not until after 1941 that the full stimulation of wartime activity upon business conditions was experienced on the Pacific Coast. In 1941 the average male workers of Nanaimo received lower annual returns than did those of either Ladysmith or Port Alberni. Employment was less steady in Nanaimo than in the other two centres, in spite of the fact that both were predominantly dependent upon forest industries to employ their citizens. (See Table XX).

The employment conditions for women were much more favour-

TABLE XX

EMPLOYMENT OF MALE WORKERS IN THREE
VANCOUVER ISLAND COMMUNITIES - 1941 ¹

	Total wage earners	Percentage of labour force	Average annual earnings	Average weeks employed	Average weekly earnings
Ladysmith	491	88%	\$ 1,225	40.52	\$ 30.23
Port Alberni	1,609	86	1,178	41.02	28.72
NANAIMO	2,096	78	982	39.52	24.81

1. Census of Canada, 1941, vol. 6, Table 2.

able. The average female worker in Nanaimo was employed for a longer period of the year than were either male or female workers in any of the three towns. (See Table XXI). Women formed a larger proportion of the total labour force than in the other two towns and had higher annual and weekly wage returns than in Port Alberni and Ladysmith. It appears probable that a "parasite" labour force developed during the coal-mining period. That is, the female members of mining families, who could not work in the mines, formed a labour supply from which the local retail and service establishments drew their employees. During the readjustment period these industries were less disrupted than the heavier industries and in the recent period of community importance as a distributing centre the women workers of Nanaimo have formed a valuable asset to the community.

In contrast to the era of large companies employing thousands of men, the distribution period has seen a great increase in the number of small privately operated concerns. The trend is most noticeable in small coal-mining, logging and saw-milling, construction and its allied trades, and in the trucking industry. Many of the small firms have been started by newcomers and are, in many instances, well suited to the requirements of the district. It is perhaps due also to the distrust engendered by the collapse of coal-mining. Many of the people feel greater security in owning and operating their own business than in being employed by a large firm. Whether this sense of

TABLE XXI

EMPLOYMENT OF FEMALE WORKERS IN
THREE VANCOUVER ISLAND COMMUNITIES - 1941¹

	Total wage earners	Percentage of labour force	Average annual earnings	Average weeks employed	Average weekly earnings
NANAIMO	455	22%	\$ 575	41.37	\$ 13.91
Port Alberni	230	14	500	36.63	13.64
Ladysmith	59	12	390	35.66	10.93

1. Census of Canada, 1941, vol. 6, Table 2.

security is justified will depend on the future of industrial prosperity in the province and country as a whole.

C. Recreation

Nanaimo is adequately supplied with a considerable variety of commercial and private recreational facilities. It has a reputation as a "sports-minded" town. However, a changing attitude toward recreation is noticeable which is partly the local manifestation of a wide-spread phenomenon but is also the result of the changing community outlook.

The mining population of Nanaimo was, at it often is everywhere, keenly interested in active forms of recreation. Track and field sports and wrestling aroused great local interest. Teams from the Nanaimo area twice won the Dominion soccer championship,¹ and Nanaimo was included in the itinerary of touring British soccer teams. The main interest was in participation in sport and in the development of local athletes.

Perhaps due to the loss of a common economic and social interest within a large group of the people, interest in participation in sports has nearly disappeared. Whereas many of the population formerly felt in common the need and the desire for vigorous open-air activity, there is now a lack of a common meeting-ground and less necessity for active recreation. The majority of the people prefer to watch others perform. The local High School track meet is now the only one of its kind in

¹ Ramsden, Erick, "Nanaimo city of 'firsts'," Vancouver Daily Province, Magazine, Saturday, May 21, 1949, p. 9.

the area. In winter the hockey team arouses greatest enthusiasm, but it is chiefly composed of players from outside areas. Lacrosse and softball are staged in minor provincial or local leagues, but neither provide active participation for many people. The chief local interests are now in yachting, bowling and other forms of sport which engage comparatively small groups of people. The greater interest in "spectator sports" is common in North America today, but is more than usually noticeable in the Nanaimo area because of its greater contrast with past activity.

VI THE EFFECTS OF COAL-MINING ON COMMUNITY THINKING

The conditions of the coal-mining industry profoundly affected the people engaged in it. Some results of this direct impact of the industry are still apparent. The vicissitudes of the industry, however, had an indirect but more widespread impact upon the thinking of the whole community. It is probable that this latter, affecting as it does a greater variety and number of people, will be more lasting in its consequences.

Many aspects of the mining industry led to a feeling of insecurity among the miners. The work was hard and uncongenial; returns in wages were frequently uncertain; strikes and mining market conditions, beyond the control of the individual, always made future unemployment a possibility; particularly in the early years, frequent mine disasters made life itself uncertain.

The reaction of the workers to these conditions was, in many ways, similar to those of the people in a New South Wales coal-mining community.¹ In the face of such future uncertainty, the miners wished to make the most of the present on such luxuries as the times afforded, rather than on houses.² Great interest was shown in lodges and other group activities. In 1901, Nanaimo supported 24 such societies and their branches.³ In the same year there were 20 licensed hotels in Nanaimo and 12 in the area beyond. The town had always been considered a hard-drinking one, both in the Hudson's Bay days when "large quantities of spirituous liquors"⁴ were consumed and in later years when Commercial street was a "string of saloons".⁵ The licensed hotels of today all date from the mining period, when the men sought an escape from their problems in drinking.

Among the older people, the difficulties of the mining period are still remembered vividly. Among those still working, as has been seen, they have produced a strong desire for independence.

Those people not directly associated with coal-mining have

1 Walker, Alan, Coaltown, A social survey of Cessnock, New South Wales, Melbourne University Press.

2 ibid., p. 15.

3 B.C. Directory, 1901.

4 British Columbia, Mem. IV, Archives of British Columbia, House of Assembly, Correspondence Book, Aug. 17, 1858, p. 69

5 Duncan, Eric, Fifty-seven years in the Comox Valley, Comox Argus Co., Ltd., 1934, p. 28.

derived from its progress, on the other hand, a prevailing sense of optimism. World and local events always occurred which rescued the industry and the area from depression. The opening of new mines or the revival of market conditions brought the industry out of temporary recessions. The strike of 1912-14 was followed by the activity of World War I and the years following. Even after most of the coal seams were exhausted, the development of the distributing industry rescued the city and the area from the depression it had suffered. Public sentiment thus tends to regard the future with optimism, without remembering that revival has come from outside sources and without considering the foundation upon which future economic prosperity is to be based.

CHAPTER VIII

THE COAL-MINING INDUSTRY AS A FACTOR IN THE DEVELOPMENT OF THE NANAIMO AREA

The factors which make the Nanaimo area locally distinctive from other parts of the upper Vancouver Island region can nearly all be traced directly or indirectly to its former close association with coal-mining. The present relationship between the Nanaimo area and the greater region owes little, directly, to coal-mining, but it has been founded upon the basis of the existing development within the area. In the future it seems probable that the prosperity of the district will depend increasingly upon regional factors which can be little affected by the actions of the local population. Future efforts of the people might well be directed toward the maintenance and improvement of the Nanaimo area in its position as an important functional unit within the greater region.

I THE INFLUENCE OF COAL-MINING UPON PRESENT LOCAL DEVELOPMENT

One of the most fundamental phenomena in local development, although perhaps not immediately obvious, is the nature of the orientation of the Nanaimo area. It is, more than most parts of Vancouver Island, confined to and dependent upon the

coastal plain. By its nature, coal-mining was restricted to the geological limits of the plain. The extent of the plain in the vicinity of Nanaimo which made coal-mining economically feasible, however, made the forest resources of the mountainous interior more difficult of access from the sea. Furthermore, during the years when many other communities were becoming established as logging and milling centres, the energies of the people and the facilities of the area were still in great measure devoted to the exploitation of the coal seams. Although mining is now of relative unimportance, the community is still essentially coastal in its outlook. Local activity is still confined to the plain, while the complex of distribution and service industries is based upon the convergence of water-borne trade routes with the main transportation route along the coastal margin of the island.

A. Influence upon Economic Utilization of the Area

As might be expected, the effects of the coal-mining economy have most strongly influenced the development of purely local industrial and commercial activity.

The influence upon agriculture has been to strengthen a regional trend in that industry. Part-time farming has been found to be an economically successful industry in other parts of Vancouver Island.¹ In the Nanaimo area, the mining

¹ Van Horne and Maxwell, Agriculture in Central Vancouver Island, 1946.

industry permitted and even necessitated the development of part-time farming as a subsidiary occupation. This industry aided many people in the period of adjustment which followed the decline of the coal industry, and has continued to be adaptable to the present economic activity of the community. Owing to the natural limitations of soil and topography it is the only form of agricultural development possible in many districts of the area. Mining brought settlers to the locality at an early date. Farming has long been established in the area and so cultivation has been extended more nearly to the limits of the arable soil available than in many parts of Vancouver Island.¹

Coal mining has thus indirectly pushed agriculture nearly to the limits of its areal expansion. Within the tracts of arable land, however, the market of the coal-mining community encouraged the development of the hay and pasture farming typical of the Pacific Northwest. The development of specialized agricultural production within the area has been in response to the comparatively high costs of farming in the region rather than to the local influence of the coal-mining industry.

In nearly all other forms of local economic activity the outstanding development is the prevalence of small-scale industry financed by local capital. This tendency may have re-

1 Spilsbury, Soil Survey, p. 62.

sulted from a distrust of further employment with large industrial firms. It was certainly, in part, a necessary response to the declining position of coal-mining. The present importance of small-scale industry is made possible by the prevailing high level of economic activity but is also well suited to the natural limitations of the Nanaimo area.

In coal-mining itself, although the mine operated by the Canadian Collieries produces the greatest part of the coal and gives the greatest employment, there are many small firms locally owned and operated. Almost all logging and milling within the Nanaimo area is similarly controlled. The transportation, retail selling, construction and light manufacturing industries are also dominated, in numbers at least, by small independent organizations. This trend is in contrast to that of many other Vancouver Island communities where the economic life of the town is dominated by one phase of the operations of large industrial corporation.

B. Influence upon Community Progress

The optimistic outlook which is a typical public sentiment in the Nanaimo area is hampered in contributing to community progress by a concomitant result of the coal-mining industry; the development of local loyalties. The mining population of each community was intensely loyal to the local centre and the local group. Nanaimo itself was similar in this respect to the smaller centres. This tendency has remained within each of the

communities in this area.

It is significant that, beyond the city limits, the surrounding territory is unorganized. Local ratepayers' associations are numerous, and the prevailing desire appears to be, as in the case of Lantzville, for incorporation as village municipalities¹ rather than for municipal organization of the whole area. The lack of cooperation between local communities appears to be making the problem of organizing a water board and of extending the city limits more difficult of solution.

A step towards greater cooperation between communities has been taken by the organization of the Nanaimo Regulated Area. It is noticeable that this development is confined to the northern section where population is now more dense and where compact, rather than linear, settlement patterns prevail.

Another factor hindering the progress of community development has been the recession associated with the decline in coal-mining. Neither private citizens, commercial firms nor the city administration were financially capable of maintaining or improving buildings of all kinds, roads and public facilities. The great improvement in the appearance of all sections of the Nanaimo area in recent years testifies that the conditions of poor repair previously general in the area were due to a lack of funds rather than to a lack of initiative or

1 Vancouver Daily Province, Feb. 2, 1950.

of civic pride. Now that money for needed repairs and expansion is available it is being freely spent. The rivalry between communities which has frequently handicapped community progress, may in this instance give it considerable impetus.

II THE INFLUENCE OF THE COAL-MINING ON THE REGIONAL FUNCTION OF THE AREA

The coal-mining industry did not of itself make the Nanaimo area important as a distribution and transportation centre, but it provided the foundation upon which this development was built.

Some locality on the central east coast of Vancouver Island would certainly have developed as the distributing point for the region. It was the harbour and transportation facilities, developed during the coal-mining era, which attracted this activity to the site of Nanaimo in particular. Although the pattern of railway facilities was somewhat decentralized as a result of mining developments, the advantages of the general vicinity were great enough to overcome the difficulty. Access to the Island Highway system was easy. Most important of all, the reclamation of the harbour areas by the Nanaimo mining company provided, in later years, a site for the Assembly Wharf and transportation terminal which became necessary for the handling of passengers and freight.

At a time when many cities in British Columbia were emerging from the pioneer stage, and before many were even founded, Nanaimo was already a busy community. In time of mining prosperity, large payrolls were periodically spent within the town. A great variety of retail and service establishments were developed in response to this source of income. Although the long strike and the depression caused many firms to close down, there were still a great number of commercial enterprises in the city. Owing to its early start it was natural that the city attained a position of dominance in the retail business of the upper island, and that this business should develop in keeping with expansion in the wide area it served. The number of urban settlements in the vicinity provided a labor force of both sexes to staff these retail and service enterprises.

Nanaimo has lost what administrative function for coal-mining it formerly possessed, but is gaining increasing dominance as an administrative centre for other public and private organizations. In some instances, however, the site has been chosen independently by the organization concerned (as, for example, the administration of the Dominion Fisheries Department on the central east coast of Vancouver/Island). In other cases, administrative functions have followed the general development of the distributing and service industry. The direct effect of coal-mining on this phase of the functional development of the area has been negligible. Nevertheless,

the tendency for administrative functions to centre in the area may prove to be an important contribution to ultimate local development.

III FUTURE POSSIBILITIES OF THE NANAIMO AREA

The course of future development in the Nanaimo area will be governed by a great variety of factors. Many of these will not be geographic in character, and will be completely beyond the control of the people in the area. Nevertheless, by taking known factors into account, some insight may be gained into the possible trend of future events, and some suggestions for future consideration may be advanced.

A. Agriculture and Forestry within the Nanaimo Area

The following statement of C.D. Orchard might have been made with specific reference to the Nanaimo area: "It is axiomatic that mankind lives by virtue of natural resources and nothing else. A people can prosper by selling services provided other people cultivate the natural resources and supply them with food and raw material, but it is a highly competitive and dangerous business."¹

Increasing emphasis is being placed, in the area, on the provision of services rather than on the production of goods. Although natural factors impose limitations on the ultimate production of primary products in the district, much might be

¹ quoted by Spilsbury, R.H. in "Land utilization on Vancouver Island," Forestry Chronicle, vol. 19, 1943, No. 3, p. 162.

done to secure the maximum returns from the resources of soil and climate which are present.

The present pattern of agricultural land use in the districts surrounding Nanaimo would be easily adaptable to a programme of interdependent agricultural and forest production. Cultivation is now nearly coincident with the extent of arable soils. In the valleys clearing is extensive and full-time farming prevails. Elsewhere, the available pockets of arable soil have been sought out and cultivated, while the forest soils have frequently been left to grow trees. In these localities, farming is often only a part-time occupation. This pattern could be utilized "to make every non-agricultural acre a productive forest."¹ At present, the practice of using non-arable soil for rough pasture is the chief hindrance to the attainment of this ideal. The pasture so provided is of inferior quality, while the grazing of the livestock ruins the vegetation cover for productive forest purposes. An effort to provide areas of improved pasture, at the same time utilizing the remaining tree cover on a sustained yield basis, would result in more satisfactory returns of both types of product.

Future agricultural development in the Nanaimo area would, of necessity, be in closer utilization of arable soil rather than in areal expansion. The produce of hay-pasture farming should continue to find a local market, and some specialty products are being marketed beyond the area in competition with

1 Spilsbury, Soil Survey, p. 76.

the produce of other places. The future of both types of farming activity is, of course, linked with the general development and prosperity of the province as a whole.

As long as the present brisk demand for lumber obtains, it is probable that the local saw-mills will continue to absorb the amounts cut in the Nanaimo area. Should the demand subside, logging might be seriously affected. The local population provides a considerable market for fuel, some pit-props, railway ties and lumber, but much of the present cut of timber is exported as lumber. Future depletion of forest resources throughout the province might enhance the value of the local resources, particularly if forest management practices were followed in the interval. At the present time, woodchips for the pulp mill are supplied from outside operations of the operating company, not from local sources.¹

The use of land for residential purposes is becoming increasingly important. Although some arable soil in the immediate vicinity of Nanaimo is used for home-sites,² many new homes in the outlying areas are being built on small holdings cleared from the forest. Present regulations do not prevent the use of agricultural land for residential purposes, although this may become necessary in the future.

¹ Crispin, C., Manager, Nanaimo Sulphate Pulp Ltd., letter to the writer, Aug. 15, 1949.

² Spilsbury, Soil Survey, p. 80.

B. Manufacturing

It is unlikely that manufacturing in the Nanaimo area will ever expand much beyond its present modest scope. The large plants already established in Vancouver and other centres possess initial advantages which local manufacturing could not attain. The chief source of the necessary energy, the John Hart project, is equally accessible to other areas. Small expansion may be possible through exploitation of the factor of proximity to the point of demand.

Expansion of sawmilling is probably limited by the extent of local forest resources and other accessible timber areas lie within the working circles of the large forest products firms. The pulp mill was established in the area because of its relative location to the other operations of one of the large organizations, and its future development will be dependent upon the operations of the parent firm.

The location of Nanaimo with respect to logging and fishing areas provides some opportunity for the repair and servicing of equipment. Provided that competitive costs can be met, work which is done in Nanaimo saves the time and shipping costs of sending the equipment to Vancouver. However, the greater facilities of the larger plants enable them to undertake projects beyond the scope of local plants, while the transportation costs which these firms must themselves bear does not permit low cost operation.

C. The Tertiary Industries

It is difficult to estimate the extent to which the present tertiary and service industries may expand. Local commercial activity of all types is at a high level, but much of it results from the demands of the local population itself. The real basis of the industry is in its contribution to the region beyond the immediate vicinity. Here again, although operating costs are high, greater proximity to the areas served proves advantageous to the industry in Nanaimo.

An opportunity for expansion lies in the wholesaling industry. Although wholesale firms are moving branches to Nanaimo, much bulk is still broken in Vancouver. Development of this aspect of the tertiary industries would be encouraged by the centralization of railway facilities and by the provision of access to sites in the port area. Future trends in local wholesale business are thus dependent upon the future actions of the Canadian Pacific company.

Study of the requirements of the areas and industries served would aid in the provision of more efficient services by the Nanaimo area. Because the industry is so closely linked with transportation it is obvious that the maintenance of good highway and bridge connections is essential also.

Centralization and improvement of transportation facilities provides an opportunity for increased tourist traffic to the area. Continued expansion and improvement of accommodation and the dissemination of information regard-

ing local attractions is increasing the importance of this industry.

D. Dependence upon the Forest Resources of the Region

The most fundamental fact regarding future development in the Nanaimo area is that it is ultimately dependent upon the forest resources of the region and the prosperity of the forest products industry throughout the province as a whole. Nanaimo and its surrounding territory is thus still dependent upon a primary industry whose products must find their place in a highly competitive world market. The situation resembles in these respects that which prevailed during the coal-mining era, with one difference; the resource is, in this case, renewable.

From the point of view of immediate economic advantage as well as from their previous experience with the depletion of a resource, the people of Nanaimo area are, or should be, deeply concerned with the whole problem of forest conservation. Possibility of forest depletion poses a more profound threat to the future of the community than is generally recognized.

The present advantage of Nanaimo lies in its location. This advantage does not stem from its relative proximity to Vancouver, since it is cheaper to transport goods by sea than by land, but from its centralized position with regard to the lumbering communities to the south, west and north. As the most accessible stands are cut, but inadequately restocked,

logging operations move to more inaccessible locations. Already these operations have, in some instances, moves so far north or west that they are no longer supplied by way of Nanaimo. Should this trend continue, it is possible that Nanaimo will lose all its locational advantages. The whole distribution industry and its associated activities would collapse, and the Nanaimo area would become dependent upon the limited productive capacity it possesses. This would mean not a temporary recession, but the complete disintegration of the present economic structure of the area.

Future development in the Nanaimo area will be completely divorced from the coal-mining industry. The community has entered upon a new phase of its existence, exploiting other resources with increased emphasis and being motivated by a whole new economy. Insofar as future conditions are dependent upon the factors present in the area itself, coal-mining has played a not inconsiderable part in assuring the future welfare of the community and its inhabitants.

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Provincial Assessor and Collector, Nanaimo
Provincial Inspector of Mines, Nanaimo
Provincial Public Works Dept., Nanaimo
Regional Planning Division, Dept. of
Municipal Affairs, Victoria.

APPENDIX A

TABLE XXII

LAND ASSESSMENT VALUES IN THE
NANAIMO AREA, 1937-38 and 1947-48.¹

	1937-38	1947-48
No. of parcels on tax rolls	6,078	13,006
Farm land	\$5,112,399	4,932,320
Improved land ²	4,881,294	6,485,796
Wild Land	239,607	338,883
Coal Land (A)	79,250	30,900
Coal Land (B)	75,508	60,002
Timber land ³	<u>3,210,432</u>	<u>8,524,179</u>
Total assessed value of land	\$13,598,490	\$20,372,080

1. From figures supplied by the office of the Provincial Assessor, Nanaimo.

2. Usually residential improvement.

3. Land becoming taxable as it is sold by the Esquimalt and Nanaimo Railway.

A. Land used for actual mining operations.

B. Land classed as "coal land" but not the scene of mining operations.

Appendix B.

Figure 50.

Land Use in a section of
the Millstone Valley.

Vertical exaggeration.

Soil - Advance Sheet No. 6
Soil Survey of southeastern
Vancouver Island, 1943.

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