THE LOCATION OF INDUSTRY AND URBANIZATION IN CANADA

By

Walter J. Alley

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Introduction

The purpose of this essay is to show the influence of such factors as resource location, topography, and climate on the location of industrial activity and urbanization in Canada.

The location of industry and urbanization in Canada attains particular significance as a study in the period from the beginning of the twentieth century to the present time. This was the period in which Canada began to build her factories. Although Canada achieved tariff autonomy in 1859, the Crown retained a decisive influence in the government and formation of policy in the dominions throughout the nineteenth century. While in theory Britain advocated free trade, she did all in her power to discourage the colonies from setting up any form of industrial organization. Moreover, prior to 1900 the New World had a frontier which had the effect of attracting a general migration westward in search of free land and economic independence. For these reasons then, we shall place greater emphasis upon those intranational migratory trends which have occurred since 1900.

On the basis of our findings, we shall attempt to predict some possible migratory trends within Canada for the next few decades. The chapter entitled "The Canadian Potential" will serve as a foundation for these predictions.

Inasmuch as coal, petroleum, and iron ore are the major resources in the modern industrial era, and are most influential in locating industrial activity, special emphasis has been given the place they occupy in the Canadian economy.

There are many other factors affecting urbanization, such as theories relating to the location of trading centers, and commercial centers. For the most part those factors which locate industrial centers alone, control most other major types of activity. In short, industry is a primary factor determining the location of all types of urbanization.

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Chapter I

Colonization and Industrialization

There is little doubt that, in the eyes of the first European explorers of this continent, the New World was just a mistake---it was just a great hurdle thrown in their paths to the East. Marco Polo's stories of the wealth and mysteries of "far Cathay", brought back from his expedition across Asia to China in the thirteenth century, were the impetus to the many voyages of discovery which occurred in the fifteenth and sixteenth centuries. Apart from those notable names of discovery, there were others --- European fishermen may have discovered the Newfoundland Banks before Cabot, and may have traded trinkets for furs with the Indians before Cartier's time.[1]

The French were the first to take up the challenge of the New World, and Canada's first 150 years belongs almost exclusively to them. They pushed inland up the rivers and lakes, mapping large areas as they went. This love of adventure and lust for the rich fur trade was the beginning of a unique wilderness economy which lasted for the first 200 years of Canadian development. It appears that Canada's early exploration and development was essentially a follow- the - beaver business.

The merchants who won the fur concession of the Gulf of St. Lawrence from the French king, sent Champlain

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1. D. C. Harvey, The Colonization of Canada, Toronto, Clarke, Irwin & Company, 1936, p. 10.

to Acadia where he founded Port Royal in 1605. This was the first permanent settlement of Canada.[1] But the fur trade even lured Champlain away up the St. Lawrence to found Quebec, following which he went up the Ottawa River to Lake Champlain, Georgian Bay and down to the southern side of the Great Lakes where he clashed with the Iroquois tribe. Up until this time they had been an orderly, well-settled tribe farming the soil. When they came to realize what the Europeans had to offer for furs, they moved north into the fur trapping area, clashed with the Hurons, the Algonquins, and the French. For a time they presented a very serious threat to French settlement in Canada.

Following Champlain, there were other waves of exploration which filled in more of the New World map; but the role of the explorers and the fur traders was soon to pass on. It was the settlers, the habitants, who built the lasting foundations for Canadian development.

Famous as the first genuine Canadian settler was Louis Hébert,[2] who arrived at Quebec in 1617. Naturally enough, the rulers of France tried to pattern their new settlements along Old World lines. The feudal system of granting land became the seignorial system; they were very similar systems save that the seignorial system was not quite so autocratic. It was not unusual to see the seigeur

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1. D. C. Harvey, op. cit;, p. 1.

2. Ibid., p. 26.

working alongside the habitants in the fields.

Religion was a strong factor in bringing the new settlements together. Every seigniory was also a parish, which not only served the settlement's spiritual needs, but also operated schools, tended to the colony's health, and generally served to create the community atmosphere. Since each family had to depend on its own efforts to succeed in this new life, large families were the rule. Although in its whole history, only between 4,000 and 10,000 actual home-seekers journeyed from Old France to New, by the time of the British administration in 1759 the French settlers numbered 60,000.[1]

The dominating geographical feature of New France was the St. Lawrence River and its tributaries. It was essentially a colony built along rivers instead of roads. Farthest upriver was Montreal which was the gathering place of the hinterland fur traders. Farther down was Three Rivers, a small rural settlement which was the seat of an iron works which made tools and utensils much needed by the settlers.[2] Quebec was the goal of all ships arriving from France. The settlers' farms were located between these three centres, laid out side by side, each having its broad river frontage.

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1. G. P. Glazebrook, A History of Transportation in Canada, Toronto, The Ryerson Press, 1938, p. 43.

2. D. C. Harvey, op. cit., p. 32.

When the British retained Nova Scotia by the Treaty of Utrecht in 1713, they acquired at the same time a population of some 2,500 Acadians.[1] Prior to the founding of Halifax, they concentrated on the task of developing the agricultural potential of the area, while encouraging the outpost of Canso for trade and the fisheries. Further immigration was discouraged in this area owing to a general fear of expansion and insubordination of the New Englanders. Various plans for the development of the new territory culminated in the arrival in 1749 of 2,576 persons, under the leadership of Governor Cornwallis, at Halifax.[2] Although this first British attempt at subsidized immigration was not the success it was planned to be, Halifax did become a symbol of British occupation of Nova Scotia and a beginning of settlement.

In the following year 350 more immigrants came from England to settle at Dartmouth, and in the same year, foreign Protestants came over from Hanover, Montbeliard, and Switzerland. By the census of 1752, there were listed 4,249 persons in Halifax, Dartmouth and the surrounding district.[3] Of these, 1,453 were moved to Lunenberg in 1753 to establish a second area of British influence in Nova Scotia.

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1. D. C. Harvey, op. cit., p. 54.

2. Ibid., p. 56

3. Ibid., p. 57.

The interest of New England in Nova Scotia had dated from the seventeenth century. They had been mainly instrumental in the conquest of Port Royal in 1710 and of Louisbourg in 1745 and generally harboured a feeling that French power should be destroyed in North America, since they had much to gain in the fishing of Canso and the other riches of the area. Hence, after the fall of Louisbourg they flocked to Nova Scotia, some 8,000 strong, there to set up fishing settlements at Minas Basin, on the Isthmus of Chignecto, and on the St. John River. There were other lesser attempts to encourage immigration into Nova Scotia and New Brunswick, but in the final analysis, Nova Scotia owes its development in the period 1753 to 1767 to the New England Planters alone.[1]

Between 1767 and the outbreak of the American Revolution, about 1,000 Yorkshiremen settled in Cumberland county, some 200 Scots at Pictou, and about 1,000 Scots and English in Prince Edward Island, while a few New Englanders and Jersey Islanders gathered Acadians together for the fisheries in Cape Breton Island. The result of this was, that by 1776 more than 20,000 persons were in the Maritime Provinces.

In Quebec the period of immigration prior to 1775 was somewhat shorter. British and New England merchants and

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1. C. Wittke, A history of Canada, New York, A. A. Knopf, 1928, p. 63.

traders had followed the fleet to Quebec in 1759 and the armies to Montreal in 1760. In both towns they set themselves up in substantial businesses, either in person or through branches. When, by the Peace of Paris, Quebec was ceded to Britain, she received at the same time a population of about 65,000 French-speaking inhabitants.[1] Although a number of seigneurs and all the French officials and merchants went back to France, most of the population of New France stayed to become part of the Canadian nation; and when the Proclamation of 1763 was issued, offering lands to disbanded soldiers and sailors, two Highland regiments, the Fraser Highlanders and part of the Black Watch, decided to settle in Quebec.[2] They settled at Murray Bay and there became the ancestors of many French-speaking Scots. In the next few years other New England and British immigrants arrived, some of them buying up used seigneuries from the French and others to follow the fur-trade or the lumber industry. By 1775, there were at least 3,000 British Canadians in Quebec.

In Nova Scotia the new immigrants were able to set up British ideals and institutions with complete freedom since the Acadians were so few as to exert no appreciable influence. As early as 1752 they published a newspaper. In

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1. D. C. Harvey, The Colonization of Canada, Toronto, Clarke, Irwin & Company, 1936, p. 61.

2. C. Wittke, op. cit., p. 65

agriculture, they owed much to the previous labour and techniques of the Acadians, but, unlike the Acadians, they extended their farms into the uplands, which the Acadians had shunned, and besides increasing production improved the range and quality of their products. By 1775 they were practically self-sufficing, although foodstuffs still had to be imported to the garrison.

Although some rum was made in Halifax and some linen in Cobequid, the products of the forest and the sea were the chief articles of export, and the preparation of these for market was the chief source of employment. Fish, fish-oil, lumber in various forms, furs, feathers, grindstones and rum were the only articles of export in 1772. Their value was 54,000 pounds sterling.[1]

During this period all communication was by sea, and out of this need grew the important industry of ship-building. Already a number of vessels had been built of various dimensions, the smaller being used for coasting and the larger for overseas trade. It appears then, that on the outbreak of the American Revolution the foundations of industry and society had been laid in Nova Scotia.

In Quebec, where the French population was much in the majority, the new settlers were not able to determine the form of government so readily, but by their stubborn insistence it soon became apparent that British institutions

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1. D. C. Harvey, op. cit., p. 62.

would be extended to them, as to Nova Scotians. In the economic and commercial spheres their influence was immediately felt. Here, also, a newspaper was started, agriculture was stimulated and improved, lumber was fabricated in many ways, the potash industry was developed, and the markets of the colony were widely extended. The fur-trade was pursued beyond the Great Lakes, so laying the basis for Canada's future claim to the West.

At the time of the foundation of British Canada in 1763, there were few permanent settlers in what is now the province of Ontario. The earliest settlement in Upper Canada was at the narrowest part of the Detroit River. In 1701 the French established a trading post at this point, and by 1763 it had a population of 1,000.

The coming of some 40,000 Loyalists rapidly changed Canada. They not only increased the population by 50 p.c. but also brought with them new ideas and energy for the expansion of the country. It should be noted at this point, however, that from the very start the British enjoyed that control of capital which later proved to be so important in a world beginning to be industrialized. The British command of the commerce of Montreal, and control of the banking and transport and the monetary power cannot be taken as entirely due to any native genius of the English merchant and the Scottish banker, but rather to the opportune initial set of circumstances. This British leadership was also in part due to the differences in habit and mode of life of

the two different nationalities. The British and British Americans were urbanized, merchants and bankers by trade, while the French were essentially people of the land.

The Loyalists accentuated these differences between the two nationalities in Canada, but in the main they were tolerant and agreeable towards each other, just as they are today. The Loyalists settled new areas in the valley of the St. John River, on the shores of the Bay of Fundy, in the eastern townships of Quebec, along the upper St. Lawrence and eastern Lake Ontario, and at Niagara. The counties of Glengarry, Stormont, and Dundas on the St. Lawrence, settled largely by the families of Highland regiment soldiers, became completely Scottish. By 1785 there were about 10,000 Loyalists in Upper Canada, mostly near Kingston and along the Niagara Frontier; by 1791 there were 20,000 English and a few French in this area.[1]

The commercial enterprise of the British was manifest in the development of the first trans-Canada transport system, in the form of the voyageur route to the Northwest, and in the revived lake-and-river route fur trade by the Montreal traders amalgamated in the Northwest Company. Their competition with the Hudson's Bay traders also served to open up the West. When Alexander Mackenzie managed to complete his trek to the West coast in 1793 Canada's full outline was finally on the map. This was the same year in

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1. C. Wittke, A History of Canada, New York, A. A. Knopf, 1928, p. 65.

which Captain George Vancouver was charting the coastal waters of the Pacific side of Canada.

The first prairie colony was established in 1812 by Lord Selkirk at the junction of the Red and Assiniboine Rivers. It was settled by Highlanders dispossess of their small farms at ho me and also a group of Norwegians who settled on the shores of Lake Winnipeg. This was the Red River settlement. Being in between the warring Hudson Bay and Northwest Companies, this settlement was twice destroyed.

Also in 1812, the Americans had declared war on Great Britain to get the British colonies. The British colonists, however, declined to be liberated from Britain. This struggle was beneficial to Canadian development in two ways: firstly, as the Canadians hurried to build ships to keep the St. Lawrence-Great Lakes life-line open they greatly developed their shipbuilding industries along Lake Ontario, and secondly, the war served to make the many different races in Canada develop a respect for each other and for their joint strength in meeting a common threat.

Following this war, the country entered its first great period of growth and development. The population multiplied more than five times to reach nearly 2,500,000 by the 1850's.[1] Unemployment in the British Isles and the

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1. D. C. Harvey, The Colonization of Canada, Toronto, Clarke, Irwin & Company, 1936, p. 81.

potato famine in Ireland also, served to bring 800,000 new colonists across the Atlantic. These immigrants filled out the riverside settlement areas of New Brunswick and the Bay of Chaleur, they occupied Quebec's Eastern Townships, went up the Ottawa and along Lake Ontario and throughout the upper province's western peninsula.

As the fur trade passed its peak the timber trade began to flourish. Great log rafts filled the rivers of Upper and Lower Canada and the Maritime. Shipyards were established at Quebec and Levis, and those at Saint John and Halifax were enlarged in order to build up a merchant marine to carry lumber and fish to the British Isles and the West Indies. Bluenose schooners, first built by German settlers near Lunenburg, sailed regularly to the Newfoundland Banks where great hauls of cod were caught. To timber and cod, wheat was added as a staple of colonial commerce. Small factories grew up at Halifax, Three Rivers, Quebec, Montreal, Toronto, and Windsor. These were small iron works which manufactured axes for the lumber camps and farm implements. They utilized local supplies of coal and iron ore. The early development of magnetite in both the Adirondacks and Eastern Ontario continued until the first decade of the present century.[1]

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1. W. H. Bonham, "Magnetite in Eastern Ontario," Canadian Mining Journal, Quebec, National Business Publications, vol. 70. August 1949, p. 57.

Keen competition from south of the border started the building of canals around the rapids of the Ottawa and St. Lawrence Rivers. The first Welland Canal was completed in 1829 so that the lake ships could by-pass Niagara. Four years before this the Americans had built the Erie Canal, which Canadian merchants soon realized would carry lake trade to New York instead of Montreal. About the same time steam boats appeared on the St. Lawrence, and regular routes were begun. Also, corduroy roads began to link the many new towns which sprang up.

In 1849 a colony was established on Vancouver Island, more than 2,000 miles from the Canadas. A gold rush at this time swamped Victoria with 25,000 prospectors for a time, but they soon carried on up the Fraser River, leaving many small towns abandoned in their wake. In 1858, however, a colony was established on the coast and named British Columbia. Most of the population was occupied in the coal mines at Nanaimo. Essentially, it was the discovery of gold which attracted the first perceptible immigration to British Columbia and forced the British government to provide justice for the area. Though it is estimated that the first rush of 1858 brought 25,000 people to Vancouver Island and British Columbia, according to the census of 1871 their total population was slightly more than 10,000, and contained every nationality imaginable. But every rush did leave a few settlers in almost every agricultural and industrial

section of the mainland. Although British Columbia's vast resources of fish, lumber, agriculture, and minerals were realized in a general way at this time, only its mineral wealth had begun to be exploited. The reason for this was the inadequacy of the labour force, itself due to the lack of communications between the two extremes of the country.

Although the Red River colony had been established in 1812, it was not until some seventy years later that the area was attractive enough to cause any significant immigration to itself. When it did start, the West rapidly assimilated many nationalities including Icelanders, Poles, Romanians, Russians, Jews, and many others. These people were not only attracted by the prospect of owning their own lands, but also by the richness of the area in the form of bountiful grain harvests, and later by the new mines in Northern Ontario and the building of the transcontinental railroad. In 1879, the Dominion Government brought 1,000 head of breeding cattle up from Montana to the foothills of the Rockies near Fort MacLeod.[1] Ranching proved to be difficult for the first few years, but as the railroad

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1. R. England, The Colonization of Western Canada, London, P. S. King and Son, Ltd., 1936, p. 63.

project reached this section of the country and brought additional settlers in the form of railroad workers, a local market was provided for this beef. As the line was completed, transportation facilities enabled the market to be enlarged to include the rest of Canada. Generally, the railroad did more then any other single factor to populate the west.

The first boom of the prairie provinces, beginning about 1874, soon collapsed however. This was particularly noticeable in Manitoba. The Dominion Government instituted the Dominion Homestead Act of 1872 to encourage immigration, but immigration was slight and confined almost entirely to Ontario, owing to the difficulty of travel before the railway linked Lake Superior and the West in 1883. With the completion of the railway to the West in 1883, these earlier immigrants who had settled in Ontario sold their farms to more recent immigrants who did not wish to go further west or to take the less fertile lands offered by the Ontario Homestead Act of 1868. In any event, although some 340,000 immigrants were attracted to Canada in 1868 to 1878 by the immigration policy of the Dominion, the majority of them went to Ontario while the older settlers of Ontario went to Manitoba.[1] The Maritime Provinces, which continued to sell their Crown Lands at a moderate price and made no special effort to advertise them, were passed by.

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1. D. C. Harvey, The Colonization of Canada, Toronto, Clarke, Irwin & Company, 1936, p. 137.

By 1881 the population of the Dominion had risen to only 4,325,000, since a considerable number of both the old and new settlers had emigrated to the United States. In the same decade the number of Canadian-born residents in the United States increased by 225,000.[1] The census of 1891 showed the same trend to be continuing despite the National Policy; emigration still continued heavily to the United States, and the number of Canadian-born residents there had increased by 262,000.[2] Therefore, even though 886,000 immigrants had arrived between 1881 and 1891, the total population of the Dominion had increased by only 508,000. This shows that both Canadian-born and immigrants had moved southward in large numbers, and that expenditure on immigration had been a net loss.

The turn of the twentieth century marked the beginning of Canada's rise to fame as a leading world power. With the turn of the century there came the long-awaited prosperity in Canada. The years from 1898 to 1913 saw a rapid recovery throughout the world from the slump of the 'nineties'. The revival of interest in the West in 1896 was due not only to the attractive land policies and the railroad, but also to the opening of the new copper mines in Northern Ontario, and the gold mines of the Yukon and British Columbia. The bountiful harvests of the Prairies

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1. D. C. Harvey, op. cit., p. 138.

2. Ibid., p. 138

and good market prices also attracted many immigrants. This trend was intensified by the vigorous advertising campaign of the new Minister of the Interior, Mr. Sifton. This campaign was carried on in the United States, the British Isles, and Europe. The general note of optimism in this period was backed by the argument that the land of the American west was nearly all taken up, and therefore the tide of European immigration must be diverted to Canada, which would then go through a similar stage of rapid development.[1] In less than twenty years before the first World War, 3,000,000 immigrants joined the existing population of 5,000,000.[2] The following table illustrates the general trend of growth in the provinces of Western Canada.

	1901		1911	
PROVINCE	TOTAL POPULATION	IMMIGRATION	TOTAL POPULATION	IMMIGRATION
Manitoba	255,211	11,254	461,394	34,289
Saskatchewan	91,279	14,160	492,432	40,076
Alberta	73,022		374,295	44,091
B.C.& Yukon	178,657	2,600	392,480	52,786
Totals	598,169	28,014	1,720,601	171,242

(3.)

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1. G. P. Glazebrook, A History of Transportation in Canada, Toronto, The Ryerson Press, 1938, p. 313.

2. R. England, op. cit., p. 65

3. G. P. Glazebrook, op. cit., p. 316.

Manufacturing until 1915 was largely concerned with the processing of the products of farm and mine, and with supplying certain goods for the home market.[1] Generally however, complex manufactures were retarded in this early part of the present century, the main reasons being (1) the unfavourable location of domestic coal in relation to centers of population and industry, (2) the still sparse population which limited markets and resulted in high labour costs, and (3) the nearness to the established manufacturing centers of the United States.[2] The first World War, protective tariffs, the Empire preferential tariff system, and better means of communication have done much to establish Canada as the second largest manufacturing nation in the British Empire.

The basic need of the Dominion in the early part of the century was, as now, for more people. Immigration which had materially increased in the 'eighties', owing principally to railroad construction and the opening of the West, fell off badly in the 'nineties' and reached a low mark of 16,855 in 1896.[3] From this point it began to recover, exceeding 50,000 in 1902, 100,000 in 1903, 250,000 in 1908 and reaching a maximum of 382,841 in 1913.[4]

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1. C. E. Landon, Industrial Geography, New York, Prentice-Hall Inc., 1941, p. 388.

2. C. E. Landon, op. cit., p. 389.

3. G. P. Glazebrook, op. cit., p. 313.

4. Ibid., p. 313.

Allowing for emigration, there was a loss until 1901, and while emigration remained important, there was a net gain of over 200,000 persons in 1913.[1]

Imports of capital on a large scale accompanied immigration. Inasmuch as only a small amount of capital could be raised in the country, public and private bodies looked to Britain, the United States, and more sympathetic European countries. Having enjoyed a long period of industrial expansion, facilitated by the machinery of mercantilism, England possessed a large amount of exportable capital. The general prosperity and promise of Canada served to make an abundant supply of credit available to Canada in London. The United States also contributed heavily to Canadian investment opportunities. The total investments in Canada in the period 1900 to 1913 are as follows:

Great Britain	$1,753,118,000	
United States	629,794,000	
Other countries	162,715,000	(2)
	$2,545,627,000	

This capital financed new railways and the industrial and agricultural development which was, for the most part, a result of these railways.

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1. R. Wilson, "Migration movements in Canada, 1868-1925," Canadian Historical Review, xiii, 2.

2. J. Viner, Canada's balance of international indebtedness, 1900-1913, Cambridge, Mass., Harvard University Press, 1924, p. 139.

The heavy expenditure on railways in the early twentieth century was justified by the rapid rate of economic development, especially by the rapid gain of agriculture in the West where the expansion of livestock and wheat-farming soon taxed the resources of the existing railways to the limit.

The following table is indicative of the rate and distribution of economic progress.

	1901	1911
Area of occupied farms in acres,	63,422,338	108,968,715
Wheat production in bushels,	55,572,368	132,077,547
Value of livestock,	$268,651,026	$615,457,833
Exports of wood & wood products,	$ 33,099,915	$ 56,334,695
Mineral production,	$ 65,797,911	$103,220,994
Gross value manufactured goods,	$481,053,375	$1,165,975,639 (1)

Agriculture remained stationary for the most part in the eastern and central provinces, but showed a marked increase in the West. Manufacturing was centered almost entirely east of Lake Superior, and its growth signified urbanization and a more mixed economy. The industries which increased most rapidly were those associated with building materials, iron and steel, and transportation equipment.[2]

Characteristic of the wave of prosperity which swept the country at the beginning of the century was the steady rise in wages. Construction materials and all

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1. Canada, Dominion Bureau of Statistics, Canada Year Book, Ottawa, King's Printer, 1934-1935.

2. G. P. Glazebrook, op. cit., p. 315.

kinds of equipment increased in price. This rise in wages and other prices was accompanied by a further increase in prosperity. Aside from the first panic which occurred at the outbreak of hostilities, World War I stimulated rather than depressed business. Unemployment and other signs of depression which had existed in 1914 were soon dispelled by an increasing demand for men and materials. Immigration fell off, and production was encouraged by the sudden demand for natural products and manufactured goods in Europe. The following table gives some indication of the effects of these conditions upon wages in Canada.

Index Number of Wages (1913 equals base year).[1]

1901	67.8	1916	105.7
1906	78.7	1917	117.5
1911	92.5	1918	139.8
1914	101.4	1919	160.4
1915	101.4	1920	192.1

By the turn of the 'thirties, manufacturing was rapidly becoming the leading economic activity in Canada, and by 1935 the value added to products by manufacture was 30 p. c. more than the output of agriculture.[2] A quarter of the manufacturing was being done by American firms which located in Canada for a variety of reasons, the most important of these being to obtain cheap raw materials, to circumvent high Canadian tariffs and to

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1. Canada, Dominion Bureau of Statistics, Canada Year Book, Ottawa, King's Printer, 1922-1923, p. 733.

2. C. E. Landon, op. cit., p. 388.

take advantage of Empire preference in shipping to different parts of the Empire; and still others so located themselves in order to satisfy Canadians' desires to buy products made at home.

By 1935 Ontatio was producing approximately 50 p.c. of Canadian manufactures while Quebec was producing about 30 p. c. Ontario ranks high as a preferential manufacturing area, especially in the area of southwestern Ontario. The reasons for this are the close proximity of this district to the important primary producers and processors of the United States, the local supplies of several raw materials, excellent rail and water connections, cheap hydroelectric power supplied by the Provincial government, and a local market and central location for shipping to other parts of the country. The relative values of the various classes of manufactured products in 1935 are shown in the following table.

PRODUCT TYPE	VALUE
Wood and paper products,	$240,000,000
Vegetable products,	$220,000,000
Minerals other than iron,	$180,000,000
Iron and its products,	$175,000,000
Textiles,	$165,000,000
Animal products,	$ 98,000,000
Chemicals,	$ 65,000,000 (1)

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1. C. E. Landon, op. cit., p. 389.

Montreal contributes about one third of the total manufactures in Canada as does Toronto. Toronto, Hamiltom, Windsor, and the other centers along the Lakes in southwestern Ontario are relatively more important for steel and other heavy industries. Raw materials and hydroelectricity of the Ottawa River have made Ottawa an important center for lumber and cement. Quebec city has long been a textile producer, and is becoming increasingly important as a pulp and paper center. The larger cities of the Prairie Provinces have meat packing and flour milling plants. Vancouver has its lumber and steel mills and its ship-building yards. Halifax has its ship yards and iron founding plants. As Vancouver has its salmon industry, so Halifax is the center of the dried fish trade of Nova Scotia, and sends large exports of fish to the West Indies and to South America and Mediterranean ports, much as it did in its earliest history. All of these centers have many smaller subsidiary industries, but in the main, their basic industries are essentially products of their environments.

This, then, has been a resume of Canadian colonization and industrialization. This development has hinged on two essential factors, viz., population, and communication. Even in the modern air-age, Canada is still a large country, and its basic need is, as ever, for more people.

Chapter II

Factors Locating Canadian Industry

Locational patterns of economic activity cannot be explained by reference to the distribution of natural resources or population at any point of time. To do so would be a gross oversimplification of the essential problem. There is a complex interdependence of industrial processes which invalidates any simple theory of correlation between resource location and industrial location. In any study of this type, the theoretical structure of these implications is a valuable tool in illuminating the causes of practical problems which develop in the specific economy. We will therefore make some reference to the theoretical bases underlying the various types of economic activity.

Generally, a good industrial location utilizes its inputs and distributes its outputs in the most efficient way, thereby ensuring society the greatest possible gain for a given amount of effort expended. The most important locational factors making for regional specialization include transportation costs, the costs of different types of labour, and the relative costs of various deposits of input materials.[1]

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1. C. J. Friedrich, ed., Alfred Weber's Theory of the Location of Industry, Chicago, University of Chicago Press, 1921, p. 33.

At best, an industry can only hope to discover its optimum location for a limited period of time since areal economic opportunity is constantly changing as new techniques are developed in response to the requirements of innovation and changing consumer demand. Areal economic opportunity is also affected by population growth and migration patterns which are still not fully understood. Of the various factors which are influential in locating industry, it is safe to assume that the majority are of a geographical nature.

Geography and topography have in some respects been an enormous hindrance to Canadian development; in other respects they have greatly promoted development. In all respects they directly affect transportation costs, and these have always been a major factor in the economy. The dominating geographical feature of New France was the St. Lawrence River and its tributaries. On this network the fur trade was founded, followed by the eastern lumber industry, which was in turn followed by the wheat trade. Today, the Great Lakes-St. Lawrence system is still the most important part of Canada's transcontinental system of transport.

Without the railroad to complete this system, however, the economy could not function at its present level of activity. The mutual interdependence of railways and general economic development has been realized throughout Canada's entire history. Railways have

enabled prairie wheat to reach the Great Lakes or the Pacific, and the forest products of the Pre-Cambrian shield to be brought within reach of markets.

Canals, highways, and communications have also played important roles in Canadian development; they too are products of geography, topography, and climate. Generally, however, the overwhelming importance of water transportation in relation to the St. Lawrence Waterway has contributed to a marked emphasis on the production and export of staples. This is evidenced in the dominance, at various stages of our history, of the fur and lumber trade, and, with the improvement of transportation by canals and railways, of the wheat trade and various other forms of agriculture.[1]

There are many other factors influencing the location and type of various economic activities, but they vary in their influence with each individual activity. At this time, therefore, we will confine ourselves with a consideration of the salient factors locating the principal industries in each of the five main geographical regions of the Dominion.

Firstly, we will consider the extreme eastern section of the Dominion, comprising the Maritime Provinces.

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1. H. A. Innis, Political Economy in the Modern State, Toronto, The Ryerson Press, 1946, p. 251.

This is a country of forests, hills and streams, with agricultural land suitable only for small scale operations. Economic activity is confined to minor industries, lumbering, mixed farming, and fishing. The only large industrial undertakings are the coal mines and steel mills of Nova Scotia, and the iron ore and other lesser metal mines in Newfoundland.

Nova Scotia is a classic example of a province whose development has been hindered by its geography. If its climate, land, and resources could be placed in Ontario, it would be one of the richest parts of Canada. It has some of the largest coal deposits in the world, but coal-mining does not prosper. Within a year after World War II, hundreds of miners were out of work, and plans were made to transfer them to the hard-rock mines in central Canada where labour was relatively scarce. Transportation costs are the basis of this problem which forces us to import millions of tons of coal from the United States every year, while our own coal stays in the mine. Owing to the distribution of the population, it is cheaper to use Pennsylvania coal in Ontario and Quebec than it is to ship Nova Scotia coal to these areas by rail or river. Even special freight rates and Dominion subsidies have failed to open the central Canada market to seaboard coal. The main use for this coal is in the steel mills at Sydney. If Nova Scotia were to develop new heavy industries, then coal-mining would likely prosper. This will quite likely be the case when the new iron ore deposits are exploited at

Labrador. When the St. Lawrence Waterway project is eventually begun, it will detract from Sydney's importance as far as this new ore body is concerned.

The location of the steel mills at Sydney follows the ortho dox pattern for a heavy industry of this type. It is located more closely to its source of fuel than it is to its source of raw materials, which are located for the most part at Wabana, Newfoundland. Industrial processes requiring large amounts of fuel, as in steel manufacturing, always involve a high proportion of weight loss and are therefore located as near to the fuel supply as possible.[1] Inasmuch as water transport is the cheapest form for carrying heavy and bulky materials over long distances, steel plants will locate on a navigable waterway where possible. Sydney has the advantage of ready access to foreign markets. This position will be enhanced if ore is forthcoming from Labrador.

Shipbuilding and repairing, and the fisheries have long been economic mainstays of the Maritimes. From the period beginning about 1754, when the Lutheran Protestants settled at Lunenburg and there built the first world-famous Bluenose schooners, the Maritimes have been adding to their long heritage of skill in the shipbuilding and

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1. E. M. Hoover, The Location of Economic Activity, New York, McGraw-Hill Book Company, 1948, p. 31.

seafaring trades. Areas such as this tend to attract and develop a body of skilled workers who in turn attract the related industries to special locations within the general area. The proposition has also been put forth that such traditionally developed skills will tend to locate an industry in a certain locality even when the original incentive to locate there has become inactive.[1] This is especially the case with those skills which are particularly unique. Moreover, these local pockets of specialized labour will also tend to create a so-called geographical inertia which serves to explain the rapid growth of some processing centers.[2] This has been especially evident in the case of some maritime cities such as Halifax and Saint John. Although they have gradually become more important as administrative and transfer centers, they still engage heavily in their traditional tasks. On the eastern side of Saint John's harbour is the second-largest drydock in the world employing many of the older master craftsmen and expert ship repairers and their descendants. Again, Halifax is the only Canadian coastal center which has sufficient "know-how" to build such precision ships as the Tribal Class destroyers

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1. R. N. Brown, The Principles of Economic Geography, London, Sir Isaac Pitman & Sons, 1939, p. 84.

2. Ibid., p. 84.

used by the Empire Navies. The only other shipyards capable of building these ships are at Liverpool where shipbuilding techniques have been highly developed over the ages.

The second distinct geographic region in Canada is the St. Lawrence Lower Lakes region, including the southern parts of the provinces of Ontario and Quebec. In this region is concentrated 60 p.c. of the population and over 80 p.c. of the manufacturing activity of the Dominion.[1] Montreal and Toronto are the chief financial and industrial centers. The economic interests of Ontario and Quebec combine mixed agriculture with intensive operations in industry, water-power, forestry, and mines, all within a comparatively short distance of the St. Lawrence Waterway system and the Great Lakes.

The Province of Quebec, an agricultural province by heritage, has, through the impetus of the last world war, turned more towards small industry, and hundreds of small industrial establishments have begun during the past few years. Quebec's position astride the St. Lawrence estuary, along with its abundant water power to provide cheap

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1. W. Miller, ed., "Canada," The Standard American Encyclopedia, 1940, vol. 3.

electricity, have been instrumental in the rapid industrialization of the province. These assets, combined with its great tracts of pulpwood forests, have been the basis of Quebec's pulpwood and paper staple. Hull, just across the river from Ottawa has the largest mill on the Ottawa River. Approximately one-half of Canada's pulp and paper products come from Quebec. In the past, the existence of American markets in reasonably close proximity to the mills, and the existence of cheap skilled labour encouraged the industry greatly.

Sherbrooke, in the Eastern Townships about one hundred miles south-east of Montreal, and located on no less than five railway lines, has marked advantages as an industrial center. It has quick direct contact with such important American cities as Portland, Boston, and New York. The climate also favours the many textile and garment producers, several of which are branches of United States firms. These factories are so located as to take advantage of the specially skilled labour which has grown around the industry. The industry itself grew up around the particular climate which, in its beginnings, was responsible for locating the colonial textile producers in the New England states. When the colonies split off from Britain, the industry itself was split. Today, however, the two countries' industries are closely allied. The Canadian producers also have access to a ready supply of American capital and the American markets. To sum up then,

a skilled supply of labour, ready access to extensive markets, proper climate, a ready supply of American capital, and cheap electricity have combined to locate the textile industry at Sherbrooke.

Montreal owes its position and present size principally to its unique position at the head of ocean navigation on the great St. Lawrence Waterway. It was originally located on the basis of its position in relation to the hinterland rivers fur trade. It is currently Canada's chief gateway for export and import trade, and to this end has developed one of the major ocean harbours of the North American continent. This harbour is capable of handling one hundred ocean-going ships at any one time. It is fear of losing some of, if not most of, this trade which has brought forth vigorous objections from Montreal towards the proposals for widening and deepening the St. Lawrence Waterway. If this development is approved, it would obviate the need for transshipping goods destined for central Canada and points further west, so resulting in lower service costs on imports and exports. Thus, Montreal owes its greatness in part to the Lachine rapids and other geographic obstacles in this otherwise "natural" route to the interior. Without this geographical barrier, Montreal might have been little larger than Quebec, which is only one-sixth Montreal's size today.

Southern Ontario is easily the richest part of this St. Lawrence Lower Lakes region. Not only is Ontario the

richest province in the Dominion, but it also has one-third of the country's population.[1] One-third of Canada's buying power is concentrated in a semi-circle of a hundred-mile radius north of Lake Ontario and Lake Erie, with Toronto as its center.[2] Half of Canada's buying power lies west of Toronto and half lies to the east of it.[3] More than one-half of Canada's manufactured goods are made in Southern Ontario.[4] Moreover, Ontario has almost one-third of the Dominion's agricultural production, more than two-fifths of the total mineral production, and one-quarter of the output of forest products.[5] These statistics merely serve to confirm the popular contention that Ontario is essentially the heart of Canada.

Historically, all factors have favoured Ontario's development, even since its earliest fur-trading days. At that time, the unbroken water route from the Atlantic, up the St. Lawrence River and through the Lakes to the

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1. W. Miller, ed., "Ontario", The Standard American Encyclopedia, 1940, vol. 9.

2. P. F. Collier, and others, ed., Collier's World Atlas and Gazetteer, New Mork, P. F. Collier & Son Corp., 1949, p.177.

3. Loc. cit.

4. C. E. Landon, Industrial Geography, New York, Prentice-Hall Inc., 1941, p. 390.

5. J. Dauphinee, Opportunity in Canada, London, Rockliff, 1948. p. 108.

beginning of the West, was the only transportation system. When the New England States renounced their allegiance to Britain, thousands of Loyalists poured northward into the area between the St. Lawrence and Ottawa Rivers, and the elongated stretch of countryside between Lakes Ontario and Erie on the south and Lake Huron on the north. Once this permanent settlement began, Ontario's future was assured. Early settlement was based on the fertile farmlands of this area, but as Canada became more self-sufficient, other resources were vital to expansion, and Ontario had them all. There were great stands of timber, ample deposits of base and precious metals, and a hydroelectric potential second to none.

Just as important in this rapid development, however, was the Province's central position. Distribution east and west through all of Canada's long and narrow belt of population is easier from Ontario than anywhere else. The Great Lakes have supplied low-cost transportation for Pennsylvania coal and Minnesota iron ore to feed the many heavy industries along the Lakes. The opening up of the prairies early in the present century also aided in the rapid development of Ontario manufacturers. The two World Wars since then have brought still further expansion and diversification.

The oft-repeated statement, that the fortunes of Southern Ontario are closely allied with those of the United States, is probably more true than many Canadians would like to suppose. Southern Ontario has developed an

industrial economy very similar to those of the American cities of Buffalo, Rochester, Detroit, and Cleveland. The many American branch plants distributed throughout the province have accentuated this trend. Ontario is bounded on the north by Hudson Bay, and to the south of the Lakes are the states of New York, Pennsylvania, Ohio, Michigan, Illinois, Wisconsin, and Minnesota. Ontario is very much like a great wedge driven into this industrial, densely-populated section of the United States, so creating a strategic economic advantage for this province.

Excellent railway and water transportation and the close proximity of adequate markets and supplies of raw materials have combined to cut transportation costs to a minimum. A stable labour supply is easily obtainable. United States capital available with little difficulty. There is ample hydroelectric power for the operation of factory machinery. With all of these factors in its favour, virtually all of lakeside Ontario is a choice industrial site. Cities such as Ottawa, Oshawa, Kingston, Niagara Falls, Toronto, St. Catherines, Hamilton, and Windsor could ask for little more in the way of preferential industrial locations.

The proposition has been put forward that, as yet, no industrial population has reached the limits of its growth.[1]

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1. R. N. Brown, The Principles of Economic Geography, London, Sir Isaac Pitman & Sons, Ltd., 1939, p. 93.

Certainly Ontario's peak is not even in sight yet. The St. Lawrence Waterway plan is one project which will greatly enhance Ontario's position. Some 3,000,000 more horsepower of cheap electricity will be generated; the construction of the seaway itself will provide work for 3,000 men for at least six years. The general consensus of opinion is that the new industries which will be attracted to the area, because of reduced transportation, service, and power costs, will make some 50,000 additional permanent jobs available.

The only blemish on this otherwise hopeful outlook was evidenced from about 1943 on. Like the remainder of Canada, Ontario will always be a great agricultural area. Because it has excellent soil and a climate suited to most farm products, especially its southern regions, agriculture has been a prime industry from the colonial era on. Expansion of manufacturing industries during World War II, offering high wages and regular hours, attracted many thousands from the rural areas to the cities. In itself, this was bad enough for the farmlands, but it was even more so when many war workers did not go back to their farms. Consequently almost 20,000 good farms were left unoccupied. These farms would be ideal locations for those immigrants who would be willing to take up farming in Canada. Unfortunately, however, many immigrants were willing to do so until they were within the Canadian borders, at which time they too abandoned the rural areas in favour of the urban.

The third geographic region in Canada is made up of the great prairie plain, comprising the provinces of Manitoba, Saskatchewan, and Alberta. This region is a perfect example of the case in which the physical constitution of the site determines the location of economic activity. In such a case, the physical constitution of the site has a greater effect on processing costs than do transfer considerations.[1] As an example, cheap land will attract a producer requiring much space but little or no fuel in his production process. Therefore grain farms and cattle ranches are located in the prairies where the nature of the soil and geography are more important than considerations of transportation costs to markets. This must not be taken to mean that transportation costs are not important to western farmers however. Even though Canadian railroad rates are among the lowest in the world, and are certainly lower than American rates, the western farmers claim that existing areal diffenentials are discriminatory and should be abolished. They argue for the extension of low rates, as they have been set in the vicinity of navigable waterways, as at the head of the Lakes. The railroads have had to cut their rates in this way in order to maintain their scale of operations, by meeting competition offered by water transportation which is cheaper. By adopting a competitive rate structure they actually keep rates at a minimum for those producers in the disadvantageous areas located away from the cheaper forms of transport, such

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1. E. M. Hoover, The Location of Economic Activity, New York, McGraw-Hill Book Company, 1948, p. 90.

as waterways provide.[1] The railroad operators also point out that any disadvantage suffered by being far from markets is generally compensated for by the advantages of cheap land, good climate, soil fertility and other such factors.

Generally, however, rail rates are much higher than water rates over long distances. Rail rates are even higher for international movements, neglecting tariffs. The reason for this is a product of the boundary itself. On the plains,many rail lines run up to the invisible boundary line on both of its sides, but few actually cross it owing to the relative scarcity of customs inspection points where all legal crossings must be made.[2] Therefore, on international shipments in this region, the trip must be made along a more circuitous route resulting in slower and more expensive shipments.

Winnipeg is the manufacturing center for much of the prairies. The great distances, however, which make large-scale industry possible, have proven a handicap also. The reason for this is that the export of manufactures outside of the prairie zone is a risky business owing to the transportation costs involved. Winnipeg factories must

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1. W. A. Mather, "How the railway situation stands in Canada today," Canadian Purchasor, August 1949, vol.28, p.50.
2. E. M. Hoover, The Location of Economic Activity, New York, McGraw-Hill Book Company, 1948, p. 218.

count on the growth of the prairie population for their expansion. As the prairies obtain more people, Winnipeg will be able to develop her industries to a greater extent, and there will also be more development in the secondary industries.

Winnipeg was primarily located on the basis of cheap fertile land at the opening stretches of Portage la Prairie, the early boom section of Manitoba. As the various railroads were built through the center, it became the hub of western railroading where the two main continental lines now converge. Before the Panama Canal was built, there were great expectations that Winnipeg would become the transport center for the West Coast of North America with a city of millions. But Winnipeg is still the center of the Canadian grain business and the Grain Exchange. Its main job is to market the product of the prairies and it is well fitted for the job with its flour mills, meat packing houses, leather tanneries, and its four main rail lines, uniquely located at the West's entrance.

As in all prairie Provinces, agriculture is the most important activity in Alberta and Saskatchewan. In Edmonton, manufacturing is confined to secondary forms even though it is the hub of Alberta's manufacturing activities. However, Alberta's opportunities for industrial development are unique owing to its geographical location as the gateway, with Edmonton at the opening, to the new resource developments of the North-West Territories. Future primary industrialization will also be strongly affected by its own vast fuel potentialities.

Edmonton was originally established as a trading post of the Hudson Bay Company, and as the fur trade became less important, it became the center of the far-western farming and ranching country, as well as the focal point for the lumber and fur trade for the entire North Mackenzie district. Being on the C.N.R. main line, it achieved its greatest stimulus in 1942 when military strategy favoured the opening up of the North and the building of the $110,000,000 Alaska Highway. All the equipment and supplies for the project were funnelled through Edmonton. With its fine air, rail, and highway connections Edmonton's future is assured as one of Canada's main transfer centers.

On the Pacific slopes of the Rocky Mountains is the fourth geographical division of Canada, British Columbia. The main economic activities of this region are forestry, mining, fishing and farming. All manufactures entering this region from the other side of the mountains are necessarily more expensive owing to added transportation costs through the mountains. Vancouver, the principal city, owes its importance to transshipment of exports and imports to and from the East and through the Panama Canal. In this case also, geography was the locating factor. Burrard Inlet, off the Gulf of Georgia, was the most natural position to build a distributing center for the goods of western Canada. The Panama Canal was highly

instrumental in the development of Vancouver as a transfer center. Generally, when the cost of rail transportation from any particular point on the prairies is greater to the head of the Lakes than it is to Vancouver, then such produce will go to foreign overseas markets, for eastern Canada and the United States via Vancouver and the Panama Canal.

It is to its mineral wealth, however, that the region as a whole owes its present importance. The discovery of gold in 1857 led to the establishment of a separate colony, which was later combined with the colony of Vancouver Island. The discovery of the Klondike region was the main impetus, and from about 1900 development was rapid.

While the wealth of the forests and fisheries was realized at this early time, the main attention was focused on gold. The region's fisheries are probably the richest in the world and have been much more important in its development in the twentieth century. Along with the agricultural products of the Peace River district, the fisheries' products have combined to establish an important cannery business. The lumber business has long been an important staple of British Columbia, and it is foremost in its primary industry.

The fifth natural region of Canada lies to the north of the inhabited portions of Quebec, Ontario, Manitoba, and Saskatchewan. It is known as the Canadian Shield, sometimes called the Pre-Cambrian shield. It is essentially a vast outcropping of crystalline rock which

stretches from Labrador to the Mackenzie River, and covers an area of some 2,500,000 square miles, or 65 p.c. of the entire country. It is a region of many lakes, rivers, muskeg, and forests, containing little arable land, but possessing large deposits of base and precious metals. Climatic and transportation difficulties have hindered development. We will discuss the progress of exploitation of these resources in detail in the chapter to follow.

Generally, then, we find the Canadian population distributed along the American border in a long 3,800 mile strip. As we have seen, the reasons for this distribution are largely physiographical. For many years it appeared that this distribution of the Canadian population would be a permanent feature, and that only the southern fringe would ever be inhabited. Two developments altered this outlook, however, and more recently they have become more influential. The first of these was the development of the rich mineral deposits of the Canadian Shield. In the past two decades, developments have occurred in these mining régions which have been the cause of many new towns being established. While the permanency of some of these new centers is to be questioned, nevertheless, the area of Canadian settlement has been deepened by this northward push, and this has contributed to a shift in the balance of the economy away from agriculture. The second stage was the development of the Peace River district of Alberta

and British Columbia, and in northern Saskatchewan. By continued research by the Department of Agriculture, a continuous northward extension of agricultural settlement in the prairies was made possible. Thus, scientific agriculture, and more especially the rich new mining fields in the eastern part of the shield, have done much to encourage Canadians to lose their sense of reliance on the American border.

From this study certain other features are particularly evident. While we still cannot be sure of all the factors causing populations to migrate, it appears conclusive that when a particular piece of the nation's geography is such as to favour the location of a certain economic activity, this factor is highly influential in attracting population towards it, if other factors favour the development of the activity. The geography of Canada also bears out the fact that access to food is essential to, and is the essential control over, population growth. An entirely unproductive and isolated land affords no home for mankind. While intensive agriculture will support a dense population which is fairly evenly distributed, as is evidenced on our prairies, the quest for minerals and their utilization results in a denser but irregularly distributed population, as in Nova Scotia and to a lesser extent Southern Ontario. An industrial community produces no food as a rule, and the limits of its growth appear to be largely dependent upon its ability to import food. Southern Ontario has enjoyed a steady and rapid development because it not only has had a very favourable

industrial location, but it also is situated in a very rich agricultural district and consequently has been able to get its food supply easily. Given adequate access to food supplies, development of mining activities in conjunction with manufacturing tends to increase population density further. Numerous examples are available from areas of Southern Ontario and the St. Lawrence - Lower Lakes region. The relative development of these and other areas will be a controlling factor in the future rate of economic progress in Canada.

Chapter III

The Canadian Potential

Any advanced stage of culture or civilization depends upon its agricultural products, transportation, and manufacturing industries. The extent to which these factors are developed determines the degree to which a culture has advanced. A nation with a favourable climate and a fertile soil will usually be well-populated. Moreover, if a nation is well-situated with respect to cheap transportation routes it will be able to trade favourably with less fortunate nations. Forest, waterway, and above all, mineral wealth, make for a richer economy. No nation has had an adequate supply of such wealth to meet the needs within its borders at any one time. The important point is that the power of a nation is judged on the basis of its ability to possess and control such wealth to a sufficient degree to be influential among the other nations of the world. For many decades it has been apparent that the value of output of the manufacturing industries has greatly surpassed that of any other form of wealth. For this reason industrial output has been the most significant measure of a nation's power in this modern era. The basic constituents of this output are labour, raw materials, and power. With these factors in mind we shall attempt to analyze Canada's position now and in the future, and to predict some possible population movements.

Firstly, we will consider the population factor. Viewing Canada objectively, no one can deny that we possess a large territory, and a comparatively small population and

correspondingly small labour force. Further, I do not believe that it can be denied that our present national framework is capable of supporting a population several times larger. Such parts of this framework as the federal, provincial, municipal, and school governments, our railways, highways, waterways, harbours, and airfields, our public utilities, social services and educational systems, commercial distribution agencies, and occupied farmlands; all of these components as they exist are indicative of the fact that Canada might potentially contain a much larger population. It has been estimated that Canada could support a population of at least thirty or forty millions.[1] In any event the fact remains that Canada is underpopulated, and this means unduly high service costs and the wasteful exploitation of natural wealth. Moreover, we cannot compete with foreign competitors who <u>are</u> utilizing their national wealths to the full. Not only do we have a surplus which we cannot market abroad because of this inefficiency, but we also have a surplus which cannot be used at home because the home market is too small. Why we haven't taken measures to remedy the situation before this is a matter of speculation. It may be a result of the narrow view that more people in the country meant fewer jobs available to the population as a whole, an unfortunate result of our early immigration and land booms. In any event, this

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1. E. Newton-White, <u>Canadian Restoration,</u> Toronto, The Ryerson Press, 1944, p.23.

view has gained too much favour in Canada. The immigration of the past did not force native Canadians to emigrate to the United States in order to find employment because they were going there in any event in order to avoid idleness at home caused by a surplus of productive powers lacking a market. We have consistently lost well-trained people to the United States. The prospect of a rich country being developed and resultant choice employment opportunities is enticing, but it is part of a long-range plan and people must live in the short-run period. Unfortunately not all men have the faith and fortitude to put into their country as did such men as Sir John A. MacDonald, Tupper, Tilley, McGee, Smith, and many others who would have been considered giants of men even in their own days. The average individual thinks in terms of personal economics and tends to go to the immediately productive area. Hence a good short-run policy for use of our natural wealth appears to be an immediate need. A sound immigration policy could have given Canada a variety of trades' knowledge which might have resulted in a more diversified economy. This would have reduced Canada's susceptibility to depressions caused by foreign economic upsets.

All of these facts point to the need for immigration at this time when we are trying to build up the economy by more completely and efficiently utilizing the many resources at hand. In Canada we have not begun to do this and the result has been wasted resources, undue wealth to the few exploiters, and undue poverty for the remainder of the population. This is not meant to detract from the glory of past achievements

with one of the smallest populations; neither is it meant to detract from the fact that we do need a larger population in order to ensure a better distribution and diversification of wealth. While the ultimate remedy is a greater population we must also realize that owing to the manner in which our resources have been wasted in the past, the immediate remedy is a sound resource policy. Lacking a unified resource policy we face a decline in standard of living for even our present-sized population. Such a resource policy in itself will provide an entirely new type of national occupation requiring more labour. For these reasons then it seems that our present population is not large enough to meet the requirements of a rapidly developing economy.

Along with an adequate labour force, an industrial nation needs such prime materials as coal, iron, copper, oil, as well as magnesium, lead, zinc, nickel, and many other rarer metals. Water power is also an invaluable asset to an industrial nation. In the following paragraphs we will attempt to analyze Canada's position with respect to these assets.

Since coal is the world's greatest source of energy we shall consider Canada's position on this matter first. More than half of our coal reserves lie in the province of Alberta, but the deposits of most immediate importance are in Eastern Nova Scotia. Coal was the first mineral to enter into Alberta's commercial sphere in appreciable quantities. In the year 1900, 311,450 tons with a valuation of $778,625 were produced in the province; but by 1949 production had reached over 8,500,000 tons with an annual valuation of

over $44,500,000. The estimated reserves of this province are 46,562 million tons.[1] At the present rate of depletion, making allowance for waste, the province has sufficient coal resources to last 4000 years, but there is no reason to suppose that it will not be used up at an increasing rate as the country is developed.

The coal of this region comes from three distinct horizons: the Kootenay, Belly River, and Edmonton formations, the quality of which ranges from semi-anthracite to lignite. The highest grade is found in the mountains, a lower grade in the foothills, and in the plains. It is interesting to note that the subsequent opening of coal mines in this province has closely paralleled railway construction and settlement.

The coal of Nova Scotia is of an excellent quality and is found close to the coast in moderately folded beds ranging from three to thirteen feet in thickness. Much of this coal is coking coal and is used in the Sydney steel mills. The coal fields of this region fall into two main groups, viz., the Cape Breton Island fields and the fields of the Nova Scotian mainland. The fields of any importance of the Cape Breton group are the Sydney County field on the east coast and the Inverness County field on the west coast. The Sydney County field is the oldest field in the region

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1. Alberta, Department of Mines and Minerals, Report on coal, Edmonton, Alberta 1950, p.1.

and is the most important as far as reserves are concerned. Coal reserves in this field are estimated at over a billion tons, and at our present rate of consumption would last for 200 years.[1] The importance of this reserve has grown with the latest developments in the Labrador iron ore area. Much of this reserve is good bituminous coking coal which is needed for the smelting of iron ore in commercial quantities, and this coal is also in reasonably close proximity with the Labrador project and the established Sydney steel mills.

Along a forty mile stretch of the west coast of Cape Breton Island are the Inverness County coal fields. This area is considered to be nearly worked out, with a remaining reserve of about 18 million tons,[2] located in remote submarine strata.

On the mainland of Nova Scotia, three miles south of New Glasgow is the Pictou County coal field. This is one of the province's earliest developed fields, and it is estimated to be more than half worked out with a remaining reserve of about 35 million tons.[3]

Further west near Chignecto Bay is the Cumberland County coal area. It is made up of two separate and widely dispersed coal bearing areas, viz., the Joggins coal area which extends eastward 19 miles from Chignecto Bay, and

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1. B. R. MacKay, "Coal; Mines and Minerals Resources," Canada Year Book, Ottawa, King's Printer, 1946, p.337.

2. Loc. cit.

3. Loc. cit.

the Springhill coal area. Currently, mining is restricted to the sectors near Joggins River, River Herbert, and MacCan.

In New Brunswick there is only one area of any importance in the Minto coal basin. Here there is only one thin sheet of coal spread over a wide area. A conservative estimate places reserves in this area at about 78 million tons.[1]

In the Hudson Bay Lowlands there are some lignite deposits spread over a six mile area. Over most of the area the coal is under a glacial overburden. Actually it is a poor grade of coal and is only important as a supply of domestic heating fuel in the immediate vicinity. It is Ontario's only coal area. There are no coal deposits of any economic importance in Ontario, Manitoba, or Saskatchewan.

In British Columbia the most important coal areas are on Vancouver Island and in the foothills of the Rocky Mountains. The best coals are found in the Kootenay district of the southern mountain region, near Crows Nest Pass. At present there are only twenty seams of coal which aggregate one hundred feet of mineable coal, but other potential areas of unknown extent do exist in this locality. At Canmore, near Banff, coal has been mined since 1888; it is here that we get semi anthracite, the highest rank of Canadian coal. The coastal region includes the fields of Vancouver Island and Graham Island. At present mining is confined to the

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1. B. R. MacKay., op. cit. p. 344

Nanaimo and Cumberland areas along the east coast of Vancouver Island. Reserves of the Nanaimo field are small. Any appreciable quantities of future production will have to come from the Comox and Tsable River deposits near Cumberland. At present, data regarding reserves of this area are insufficient for estimation purposes. The total production for British Columbia in 1945 was 1,699,780 tons.[1]

There are many scattered mines in both the Yukon and the Northwest Territories, but these are of no great commercial impertance. There are no available estimates of possible reserves in these regions. Any coal mining in these regions has been strictly of local impertance. We shall consider the Yukon in a separate section later.

Generally, Canada cannot meet its domestic coal requirements and has customarily imported the bulk of its coal from the nearby United States fields. In the past decade we have generally imported about three times as much coal as we have exported. The matter of importing and exporting coal has largely been one of locational convenience as far as the United States and Canada are concerned. The extreme eastern and western parts of Canada export coal to the United States while the central sections of Canada import coal.

We shall now consider Canada's position as regards petroleum reserves. Petroleum and coal have long been

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1. B. R. MacKay., op. cit. p. 346

competitive sources of power. But owing to the fact that it is difficult to convert a plant designed to use one into a plant which will use the other, short-run fluctations in their price will only have a small effect on the substitution of one fuel for the other. Long-run trends would likely be reflected in the design of new plants. Because of her almost complete dependence on the United States for petroleum, as well as coal, Canada has followed the United States in most production techniques requiring such forms of fuel.

While there has been some oil recovery in Canada from as early as 1858 from the Maritimes and central and southwestern Ontario, it was not until 1936 that Canada developed its first major oil field. This field was located in Alberta in the west flank of Turner Valley. Between this time and 1942, when the Turner Valley reached its peak production, several additional discoveries were made on the plains. On the Saskatchewan-Alberta border at Lloydminster, a heavy black crude oil was discovered which gives a low recovery of light fuels.

In an effort to supplement waning Turner Valley production, wildcat wells were bored over wide areas of the foothills and central plains, resulting in the discovery of a number of smaller oil fields. It was not until the discovery at Leduc in 1947 that a reservoir was found which could supplement the diminishing production in Turner Valley. In 1948 an even greater field was discovered at Redwater, about sixty miles north northeast of Edmonton.

The known fields on the central plains are estimated

to be capable of producing over 800 million barrels of light crude oil.[1] These discoveries alone are sufficient to place Canada among the major oil producing nations. In the short space of two years the problem of supplying a local market has become a problem of finding a market for growing production.

The bituminous sand deposits of northern Alberta cover an area of 10,000 to 30,000 square miles. Estimates of the size of this deposit vary from 100 billion to 250 billion barrels of heavy asphaltic crude oil.[2] The most important part of this oil district is the so-called "Athabaska tar sands," which in itself constitutes the largest known deposit of oil in the world. This sector is located at Fort McMurray on the Athabaska River. The oil is heavy, viscous, tarry, and crude. It is too heavy to be produced from wells; rather it is mined and the oil is then distilled out, dissolved out, or washed out with hot water. At Bitumount, fifty miles north of McMurray on the Athabaska River, an Oil Sands Limited plant is operating and experimenting with new recovery techniques. To date the hot water method has been found best. The loose washed out sand has been found to be suitable for the manufacture of glass. If a glass manufacturing plant

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1. Alberta, Department of Mines and Minerals, Report on oil, Edmonton, Alberta, 1950, p.2.

2. Alberta Society of Petroleum Geologists, "Western Canada," in Levorsen, A. I., ed., Possible future oil provinces of the United States and Canada, Tulsa, Oklahoma, American Association of Petroleum Geologists, 1941, p.17.

could be combined with the oil recovery plants, an operation might result which would be profitable enough to overcome the present prohibitive cost of recovering this oil. Virtually all of this oil deposit is too deeply buried to be mined under present-day conditions of cost. The only workable deposits are along the valley walls of the Athabaska River and some of its tributaries. These currently mineable benches are estimated to contain 500 million to a billion barrels of oil.[1] The Oil Sands Limited plant now operates with a capacity of 350 barrels a day, complete with mining equipment and refinery.

There is also commercial production of oil at Fort Norman in the Mackenzie River district near the Arctic circle. While the Norman Wells were established on a production basis as early as 1920, their real impetus to production came during the war with the institution of the Canol Project. This project had three objectives:

1) To produce 3000 barrels daily from these wells;
2) To build a four inch pipe-line from the wells to Whitehorse in the Yukon, 600 miles away, and to so deliver to Whitehorse 3000 barrels daily;
3) To build a refinery at Whitehorse to refine the crude oil.

All of these objectives were achieved by 1945. The greatest

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1. Alberta Society of Petroleum Geologists, op. cit. p. 18.

interest in these wells now is in connection with the development of mining areas at Yellowknife. Reserves for the Norman Wells are estimated at 33 million barrels.

Generally, slightly more than 99 p.c. of Canada's oil production comes from the Alberta fields. Owing to the latest discoveries in these fields in the past few years, the general consensus of opinion among authoritative sources is that Canada will be completely independent of foreign oil supplies by about 1953. It is generally agreed that development will continue at its present rate inasmuch as market pro-rationing has had no apparent effect on development activities to date. Actually, it was not until the high consumption of oil in the war years overtook production in the United States that the extensive search for oil spread into Canada. The mounting prices paid for crude oil helped to finance the huge capital outlays and operating costs required for geophysical operations and wildcat drilling.

Natural gas, while it is a less important source of power, warrants consideration at this point inasmuch as it is often found in association with oil deposits. In New Brunswick, in the vicinity of Moncton, natural gas is more important than the oil produced. On an average of 650 million cubic feet of natural gas are made available per year. Only 25,000 barrels of oil are produced annually in this area.

In southwestern Ontario there are some gas wells in operation but they are of no great commercial importance. In this region gas and oil generally occur in different areas, and in different geological fields. Gas production is now concentrated in Ontario in the counties of Middlesex, Lambton, Kent, and Essex. Owing to the extravagant use of gas and oil in these sectors in the past they are now in a sad state as far as reserves are concerned.

Currently, Alberta is the chief producer of natural gas. Gas and oil are generally closely related as to origin in this province, but owing to the greater mobility of the gas, it is often found some distance from the oil deposits. With few exceptions, however, the subsequent discovery and development of gas fields in this province were incidental to the search for crude oil. Although there are a number of small gas fields in the province with undertermined reserves, the most significant field of any commercial importance is the Viking Gas Field which was first connected to Edmonton in 1923. This field has proved to be one of the largest known reserves in the province, with reserves estimated at one trillion cubic feet.[1]

Aside from these more significant gas fields, it is rather difficult to make an accurate estimation of gas reserves for an area inasmuch as it is a highly mobile resource and also, new gas strikes are being made almost

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1. Alberta, Department of Mines and Minerals, Report on natural gas, Edmonton, Alberta, 1950. p.2.

every month in connection with the current search for petroleum. In the years 1945 and 1946 huge gas fields were found, and it is now certain that these gas fields extend over large areas of the province. When gas was more plentiful than oil in the province, plans were made to convert these large findings of natural gas to liquid fuel, but with the Leduc discovery these plans were shelved.

Alberta, therefore stands as Canada's chief reservoir for petroleum and natural gas. The only other area in Canada of any importance is New Brunswick at the Stoney Creek field, nine miles south of Moncton. It is generally suspected that other gas and oil fields exist in this area but these are covered by an extensive sub-surface. The main factors deterring more active prospecting in the Maritimes are the presence and great thickness of non-marine sediments and the almost complete lack of surface indications of oil and gas in the form of seepages. Any commercial production in Ontario is confined to a line joining Hamilton and Sarnia.

Alberta's potentialties alone appear of significant magnitude to influence any future population movement within Canada. All other Canadian oil and natural gas reservoirs of any importance have already employed the maximum amount of labour required for their exploitation and are of no possible significance in influencing future possible population movements. The decline of such areas of employment, however, may hasten the day when workers are forced to leave their home areas in search of other forms of employment in areas of higher employment potentiality.

Hydro electricity has long been an important source of power in Canada and has been chiefly responsible for the rapid development of industry, especially in Quebec and Ontario. The main reasons for this are its inherent inexhaustibility and its cheapness. Water power is also important in Canada because it occurs in the acute fuel zones wherein other forms of power are not economically or conveniently available. For example, in Ontario and Quebec are found many of the important raw materials of industry and along with these, this area possesses more than half of the available water power of Canada.[1] This has resulted in Ontario and Quebec becoming Canada's most densely populated provinces. In the Maritime Provinces and in British Columbia water power has been important in developing the pulp and paper industries, as was the case in the Quebec and Ontario mills.

In the past few years, however, newsprint production, and to a lesser extent other industrial production in Quebec, was seriously curtailed by a shortage of water power. In 1948 a prolonged drought during the late summer and fall months resulted in a sharp reduction in electric power in Ontario. The result of this was renewed pressure for the

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1. Canada, Dominion Bureau of Statistics, "Power generation and utilization in Canada", Canada Year Book, Ottawa, King's Printer, 1940, p.353.

development of the St. Lawrence waterway resources. Under the general plan for development, the United States and Canada would share equally in the expense. The State of New York would probably bear most of the American portion of the expense since it stands to benefit most directly by the plan. This project would make an extra 25 p.c. of hydro electric output available to Ontario. Moreover, Ontario and these American states along the lower lakes ports would benefit directly by being able to receive ocean shipping. This development, coupled with the Labrador iron project, would mean a greatly increased industrial capacity for Ontario, with a consequent increase in population drawing power.

Finally we come to a consideration of Canada's raw material reserves. Firstly, we shall consider iron inasmuch as it is the basis of our industrial civilization.

Canada customarily imports steel from the United States. During World War II Canada took about 11 p.c. of the United States' export steel. As we progress as an industrial power our demand for steel will continue to grow, and the problem of obtaining additional quantities of iron ore will become increasingly more important.

There are three main regions in Canada in which iron ore is found, viz: the pre Cambrian shield, the Appalachian region, and the Cordilleron region. There are also some deposits in the Sutton Lake district in the Hudson Bay lowlands. Our most important reserves, however, are found in the shield.

Herein are the Steep Rock Iron Mines of Ontario, the Quebec-Labrador iron deposits, the Michipicoten district, and also some magnetite deposits in southeastern Ontario.

The Steep Rock project rates as one of Canada's most important reserves. The ore is high grade and the reserve is extensive. The only difficulty associated with the operation is the matter of getting at that portion of the ore in the lake bed, and the problems associated with this difficulty are many. One zone, immediately to the south of the lake, can be mined by open-pit methods. Reserves of this immediately available ore are estimated at 15,233,000 tons.[1] Currently two million tons per year are being taken out. (Compare this with the expected annual yield of 10 million tons to come out of Labrador). At this rate there is about another six years' work left in this open-pit sector. At that time it is hoped that the lake will be sufficiently drained to enable mining in the main body at the lake bottom. Although there are no official estimates of the reserve in the main ore body, it is generally believed that it will be extensive enough to give Canada a primary industry in iron ore. This project will constitute a great asset to Ontario manufacturing firms.

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1. Canada, Dominion Bureau of Statistics, "Mines and Minerals; Iron," Canada Year Book Ottawa, King's Printer, 1945, Chap. XII, p. 313.

The Labrador-Quebec iron ore deposit is the most important mineral project in Canada today. If there was ever any doubt that Canada could acquire a strong primary industry, this project will serve to dispel it conclusively. Not only will this project soon be able to supply our own increasing needs for iron ore, but it will ultimately make up much of the tonnage consumed in the United States and other countries around the North Atlantic.

The ore is very much like that of the Mesabi range of Minnesota both in its occurrence in the rocks, and in its high grade and vast amounts. The ore zone lies astride the Labrador-Quebec boundary. This has necessitated the incorporation of two companies, each to hold a concession under each area's government. At the present time intensive exploration is going on in the 18,000 square miles of territory in order to determine the location of the richest sections. The reason for this is that the present holding is to be cut to 2000 square miles at December 31st. 1953, and the exploiting companies want to include the richest sections within the allotted 2000 square miles of territory. Also like the Mesabi range, The Labrador area contains a substantial tonnage of manganese which is a welcome addition to the manganese resources of this continent.

Three years ago the company set as its ultimate objective in this area 300 million tons of high-grade iron ore as being the minimum amount that would warrant the heavy capital investment required to exploit the area. It has been estimated that approximately $200,000,000 will be

necessary to provide the needed equipment. The required extent of ore reserve has been proven.[1] It is in twenty-five separate deposits, the largest of which contains 45 million tons. As the state of exploration within the area now stands, other discoveries are quite likely. There are many areas of lesser grade ore which can be ultimately mined once operations are begun. The initial objective of the area is ten million tons per year. This means that there will be certain employment for miners and other affiliated workers for the next fifty years at least. The emphasis during the next few years, however, will be on finding markets for the ore. The prime need at present is to build a 350 mile railroad for hauling supplies in and later on to haul ore out from the site of the Burnt Creek camp. The terminus of this line will be at Seven Islands, Quebec on the north shore of the St. Lawrence River. With the aid of an ice-breaking ship, Seven Islands could be used as a year round port. But late and early frosts in the interior will cut actual mining down to a six months period per season. This will necessitate stock piling at Seven Islands. At this point it is significant to note that, although until recently there were no human inhabitants in this part of the Labrador Peninsula, there is no reason to suppose that human inhabitation of the area on a permanent basis is impossible. Actually it is on the same latitude as the Flin Flon mine in northern Manitoba;

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1. W. M. Benham., "The Labrador Iron Range," Canadian Mining Journal, Quebec, National Bus. Publ. Ltd. vol. 70. July 1949, p. 59.

Edmonton, Alberta; and Prince Rupert on the Pacific coast. There appears to be no reason why a thriving mining and steel community could not be developed in the area.Furthermore, there is an abundance of water power in the area which could be used to supply the community with fresh water and hydro electricity. This also brings up the question of electrically smelting the iron ore. This method of smelting is used in Sweden to produce a very high grade of iron and steel which sells at a premium the world over. The only reason other nations do not produce such iron and steel is because they lack the necessary water power to produce the great amount of electricity required in the process. In the Labrador area, however, there does seem to be enough power to produce a moderate annual tonnage of such high grade material, especially in the colder seasons of the year when mining operations could not be carried on. At such times of the year more labour and power would be available for smelting operations.

There are several possible markets to consider for this ore; the main problem at present is how to get at them. A small market exists at Sydney, Nova Scotia for high grade ore to mix with the ore currently received from Wabana, Newfoundland. A much more important potential market is that currently being served from the Lower Great Lakes ports by the Lake Superior ore body. The distance by water from Seven Islands, Quebec to Cleveland, Ohio is not much greater than the distance from Duluth, Minnesota to Cleveland, but owing to the need for transferring the ore to the smaller

St. Lawrence River canal boats or to rail at Montreal, the advantages to be gained by using this more cheaply mined ore are offset by abnormally high transportation costs. The widening of the St. Lawrence waterway would alleviate this situation along with some others. As the situation now stands, it would seem profitable to ship the ore to Montreal or Baltimore and then transfer it to rail at these points for shipment to the smelters at Pittsburgh.

Great Britain may also be a potential market for this ore. Currently, Britain is taking high grade iron and steel from Sweden, but if Germany continues to rehabilitate her steel industries with Swedish steel, less of this steel will be available to Britain. Britain would find it to her advantage to use our high grade steel, providing we decide to produce this high grade electrically smelted steel.

Such a potentially strong primary industry as is presented in the Steep Rock and Labrador mines is important to Canada as a means of obtaining numerous materials not available within its borders and which must be imported. Cotton, citrus fruits, petroleum, coal, and many other necessities are currently being brought in from the United States. A strong primary industry will help us to overcome an unfavourable balance of trade which has customarily existed. High grade iron ore is important to the United States for two reasons; firstly, the United States must start to conserve its resources owing to the fact that rapid depletion of them in the past few years has become a serious threat to the security which that country has customarily vested in its

large resource reserves; and secondly, the United States must retain the advantage it enjoys in being the world's leader in the iron and steel industry by being able to obtain an abundant supply of high grade ore at a reasonable price. Steel is the basis of the American economy and if adverse conditions in the Lake Superior iron ranges cause the price of American steel products to rise, then the United States will lose some of its marginal markets. By the same token, it seems logical to expect Canada to assume a much stronger position on the international trade scene because of this potential primary industry.

These potential primary industries and the many subsidiaries associated with them will be powerful in their influence on future population movements within the country, not only because of their magnitude, but also because the greater part of them occur in uninhabited regions of the country.

While Canada's other types of mineral production are highly important, there have been no other current developments significant enough with respect to the foregoing factors to influence the present population distribution. The nickel depo sits of the Sudbury district now produce eighty-five per cent of the world's nickel. Since there are reserves capable of so supplying the world's needs for several decades to come, there is no reason to suppose that an abnormal quantity of labour will enter the market for employment in the near future because o f dwindling activity in this industry. That is to say, the industry

is in a static condition with respect to its labour needs. Much the same situation holds for such o ther important industries as gold, copper, lead, zinc, and other major minerals. The fact that a large reserve of iron (over forty million tons,)[1] has been found at the site of the Ruth and Lucy iron mines in Michipicoten does not mean that there will be any great influx of people to the area because it is probable enough labour exists in this area to efficiently operate the mine. But the new reserve will serve as a source of employment which will supplement other waning reserves in the same general area. Much discussion centers about recent uranium finds, but these also are of no real significance in influencing the current population distribution. Deposits of uranium are found in widely scattered areas in Canada, and are generally small. Again, in the Lake Allard district of Quebec we have recently discovered the world's largest deposit of titanium, but it does not seem too likely that there will be any significant population movement in connection with its development. Because the deposit occurs in a relatively densely populated area which can supply labour needs there will be little or no need to attract labour to the area.

Canada's forest potentialities present a unique and somewhat different problem. In the past our only

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1, "New Big Iron Mine for Ontario," The Northern Miner, Toronto, Northern Miner Press, May 26, 1949, p. 1.

concern was with the number of board feet of wood which any particular forest could yield. It has only been in the past decade that Canadians have developed some appreciation of the other values associated with forest lands. Good forest conservation policies in the past would have obviated the need for emergency expenditures in order to cope with such problems as soil erosion, flooding of rivers and streams, silting in channels and reservoirs, a dwindling wild-life as well as the actual timber shortage. It is now apparent that values should have been assigned to these associated factors as well as to the actual quantity of timber in a forest.

There have been many and varied suppositions as to the extent of Canada's reserve of usable timber. One estimate places the end of cutting operations as early as 1960.[1] While the end may be in sight, there are reasons for believing that it will not be this early. As the author of this estimate points out, however, the cost of transporting many stands of usable timber to a market would render the operation an economic loss under present cost conditions. As examples he gives the northern Canadian stands in Ontario, Quebec, and British Columbia. These forests may be remote from markets now, but as the country is progressively populated and developed the markets will move towards these remote areas. The close proximity of the western timber stands to salt water is an important factor in any

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1. E. Newton-White, Canadian Restoration, Toronto, The Ryerson Press, 1944, p. 63.

consideration of the potential markets for this B.C. timber.

As we have noted, The most pressing problem is that of conserving and replacing forests. There has been much thought on the matter but comparatively little has been done. It has been estimated that fire destroys more than 400 million cubic feet of mature timber, and nearly 650 thousand acres of immature growth annually.[1] This means that fire destroys one third as much timber as is cut for use annually in Canada.

It is now apparent that in line with any attempt at forest conservation the Dominion Government must maintain strict control over exploitation. In the past it was the general practice of private interests to buy a tract of forest and clear it completely of the best trees. The only concern was over immediate profits and wasteful exploitation was therefore the rule. The idea of reforestration is relatively new owing to this previous preoccupation with securing immediate profits. The novelty of reforestration has obscured the actual inadequacies associated with the current practice. In its efforts at conservation, the government required private exploiters to plant a new tree for every tree removed. But it is not enough to plant one tree for every tree cut down since only 25 p.c. of such replanted saplings survive to a mature growth. The private operators were only too happy to make this token effort and no more. Nevertheless, properly conducted, artificial forestration is a vital part of forest preservation and it

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1. E. Newton-White, op. cit. p. 62.

is essential that the practice be carried on.

Soil is the chief resource to benefit by forest conservation. The destruction of forests during the past few decades has caused the loss of enormous quantities of soil. Fire, wind, and water do most to destroy it. Fire can destroy dry humus completely, and indirectly it destroys forests which in turn exposes the soil to wind and water erosion. Some of the later mechanized farming techniques have also contributed to the loss. Improved transportation has taken the fire threat everywhere. The net result of this has been the noticeable decline of the agricultural sections of the country. Nowhere in the world has soil erosion been so evident as on the North American continent.

For any farmland there is an appropriate ratio of bushland to cultivated land which even the best soils need. In this respect it is apparent that the most important areas to plant are the prairies and the deforested wastelands lying close to the settled areas of the country. Soil loss has been largely responsible for the close settlement of the Canadian population along the southern border. Several farming communities of the northern prairies have declined in the past twenty years directly as the result of soil loss. This has even been the case in parts of the Peace River country. In the decade 1931 to 1941, seven areas designated as Local Improvement Districts declined and the total loss of arable land in these occupied

districts was more than 20,000 areas.[1] But this area constitutes only one small part of the country. The same situation holds for many other areas also as we shall now see.

The St. Lawrence Lowlands zone is one of the most heavily populated parts of Canada. The rapid growth of the area was originally a result of its fertile soil, good terrain, and prolonged growing season. In the past two or three decades, however, the fertility of the soil has declined owing to forest exploitation and intensified farming methods. The continued high rate of population growth in this area has more recently been the result of forest and mineral developments, and the proximity of the area to cheap and abundant sources of power, and the main transportation routes east and west. It has developed into a natural area for industrialization and consequently Canada's largest cities are found in this area. The prospects for continued population growth in this area are now good because of the extensive mineral reserves nearby.

The pattern is also evidenced in Prince Edward Island where the farm population declined by 4,411 people in the decade 1931 to 1941; in New Brunswick the corresponding figure was 16,508; in Nova Scotia it was 33,981, and in Southern Ontario it was 80,000.[2] In all of these areas rich tracts of forest lands have been progressively mined out.

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1. G. H. T. Kimble, "Canadian Population and Immigration; The Geographical Context," McMaster Symposium on Population and Immigration, 1949, p. 1.

2. Ibid. pp. 5, 7.

While soil erosion has been a big factor in causing the abandonment of this farmland, other factors have contributed such as the lure of city atmosphere to youth, the growing mechanization of farming operations, and above all, the rapid rate of industrialization which in itself is due to an abundant supply of minerals and power.

While it is important that Canada should diversify her economy in order to cushion the shock to the domestic economy in times of international currency difficulties, this should not be done at the expense of proven export staples. The development of her mineral wealth will progressively make Canada a richer and more powerful nation but this can only be done with a much larger population. Moreover, in the short-run we must establish a more satisfactory rural-urban population ratio with the population we now have in Canada. In the past, the world has looked to Canada as a major source of food. In view of the acute food shortages in other parts of the world we must maintain this role efficiently. This can only be done by caring for the soil <u>for it is the sole source of these live resources which are needed to feed and clothe mankind</u>. Further, Canada attained recognition as an agricultural economy on the slim margin of 6 p.c. of its land area. Only 15 p.c. of the country's land area can be classified as possible arable land for ultimate use.[1] This percentage of arable land is dwindling continually because of our own negligence and faulty land policies. The mineral

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1. E. Newton-White, <u>op. cit.</u> p. 54.

resources will keep indefinitely, but the soil, which is even more valuable, is escaping us daily.

We now come to a consideration of the Yukon as a potential area of population settlement. The Yukon covers an area of 207,000 square miles, much of which is still unexplored. As yet there is no permanent settlement of the Yukon owing to a lack of agricultural tracts and saleable timber.[1] Communications have remained much the same over the past fifty year period; at the beginning of this period the Klondyke gold deposits were being exploited. These deposits ultimately produced 200 million dollars worth of gold. Actually, it was the only mineral project in the Yukon rich enough to warrant the building of a railway and other communications. These connections are very limited and are now somewhat primitive. At Whitehorse, in the southern section of the Yukon, there is an important copper reserve of 400,000 tons of proven ore.[2] There are also a number of silver and lead deposits in this part of the Yukon but these are not too important. In the central Yukon is the famous Mayo silver and lead camp which covers

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1. W. M. Bonham, "Mineral Areas of the Yukon; Part I," Canadian Mining Journal, Quebec, National Business Publications Limited, April 1949, p. 71.

2. W. M. Bonham, "Mineral Areas of the Yukon; Part II," Canadian Mining Journal, Quebec, National Business Publications Limited, May 1949, p. 70.

an area of several hundred miles and is probably the largest silver-lead area known in Canada. Dawson is located 120 miles west of the Mayo deposits, and after half a century of placer mining it is still productive. The Dawson area can be expected to continue producing gold at its current rate of two million dollars worth per year for many years to come.[1]

The prime need in the Yukon is for roads which will serve to encourage and facilitate the intense prospecting now needed to develop the many potential camps. In this respect the Dominion Government has done some surveying but little else. The Government has also begun to survey the hydro electric potential of the Yukon. A plant has been built on Snare River to serve the Yellowknife gold camp in the Northwest Territories.

Generally, there is no reason to suppose that the Yukon will ever offer any development attractive enough to induce a noticeable migratory trend into the area. It is very unlikely that there will ever be a mineral development of a sufficient size to absorb these service costs which are normally borne by agriculture, forestry, and manufacturing. Mining alone must bear these costs in this region. Therefore there is little basis for supporting a permanent settlement in the area.

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1. W. M. Bonham, "Mineral Areas of the Yukon; Part III," Canadian Mining Journal, Quebec, National Business Publications Ltd., June 1949, p. 67.

What has been said about the Yukon is even more true of the Northwest Territories. Much of the area is still unexplored, though aerial photography has permitted mapping of the better known travel routes and the areas where minerals have been found. The main mineral deposits are in the districts of Keewatin and Mackenzie, especially around Great Bear and Great Slave Lakes where the larger uranium developments are located. The chief output of the Territories, however, continues to be furs and will probably continue to be for several years to come. About a third of the mainland is treeless, as is the case on all of the Arctic islands. The entire Northwest Territories only has a population of 12,028, according to the 1941 census. No significant change in this figure can be expected in so barren an area. The significant fact remains, that any area must be able to feed its population or have a large enough industrial output to exchange for that required food. On this basis, this area now supports its greatest population.

Chapter IV

Probable Population Trends

The real significance of any study of population lies, not in its ability to predict the exact size of a particular population at a future date, but rather to predict what trends must naturally follow from known trends in the absence of unforeseen disturbing factors. Such things as wars, epidemics, famines, depressions, and migration are a few of those disturbing factors. In this study we have considered the effects of industrial expansion on migration, and at this point will attempt some amateur predictions concerning possible future migrations, based on expected future events within the industrial system. In doing so, we do not preclude the possibility of other disturbing events offsetting the effects of the expected events.

It may well be that sensational developments in Canadian industry will occur in the wastes of Labrador. Although these northern riches are likely to provide a certain economic and geographic unity in northern Canada, it does not appear very likely that the Shield will ever support a large permanent population. Hydroelectric projects, the production of pulp and paper, and the development of mineral resources could possibly provide for a small fixed population. Food would need to be shipped into the Shield continually since the area is almost completely barren of crops. In all, it does not appear that the northern frontiers will be pushed back to any great extent by the latest mineral finds in the Shield.

The type of working force required in the Shield would result in large nomadic movements from one small area of settlement to another. While it is very likely that a small town will be established at the site of the Burnt Creek camp in Labrador, there is only a sure basis for its maintenance for the next fifty years. It could, however, attract a substantial population during that time. It would be essentially a mining and steel working population, and would likely come from the Maritimes where such work is now being carried on. This supposition is borne out by the fact that, while the Maritime population has been moving steadily to the manufacturing centers,[1] the mines and smelters have only been able to employ the surplus during wartime boom periods. During the post-war period, there has been a marked decrease in employment in Nova Scotia mines, and steps were taken to transfer miners to the hard-rock mines in central Canada. It is quite conceivable, however, that the Labrador project could absorb many of these miners in the near future. It is also very likely that a small community will develop at Seven Islands, Quebec, where the Labrador ore will be stock-piled and transferred to ships. Unless subsidiary industries were developed, this center would require a somewhat

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[1] Appendix: see table III to note the tendency for the urban and rural non-farm populations to increase in the Provinces of Prince Edward Island, Nova Scotia, and New Brunswick, during the last census period.

smaller working force.

Generally, however, it appears that most migration will occur towards those areas already occupied. An analysis of the trend since 1911, with its emphasis on rural-urban migration, shows it to be the basic trend, even in spite of the opening up of the Prairies and some backing up on the land during the depression. Since 1911, five provinces have shown consistent movements. Ontario and British Columbia have gained, and Prince Edward Island, and to a lesser extent New Brunswick and Manitoba, have lost population.[1] Saskatchewan gained somewhat in the 1911-1931 period and lost heavily thereafter.[2] In view of past trends, and increased industrial expansion, it appears that Ontario and British Columbia will continue to be urbanized, and that some migration towards these Provinces will continue from Prince Edward Island, New Brunswick, Manitoba, and Saskatchewan.

At this time, Alberta appears ready to attract a substantially larger population along with British Columbia. Alberta, with its vast reserves of newly-discovered petroleum and natural gas, has already attracted numerous industries. Its strategic location with respect to the riches of Alaska is also encouraging. There are also sign of heavy speculation in real estate in Edmonton. Edmonton could quite easily become the manufacturing center for the Prairies. The key to Alberta's successful expansion, however, lies in the development of its farm areas. These not only supply the food needed to support a manufacturing center, but they also provide the markets for its

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1. Appendix: see table I.
2. " see tables I and III.

manufactures. In the past, lack of population has hindered the development of the secondary industries carried on in Edmonton in conjunction with farming and ranching.

British Columbia, our last Province to be settled, has shown an unusually high rate of increase during the past decade.[1] It had, even from its earliest history, been recognized as one of the richest provinces in the Dominion, but the mountain barrier along with heavy growths of timber, have retarded settlement. Rapid development during the past fifteen years may be attributed to high labour costs, advanced labour laws, and attractive living conditions. Even now many plans are being adopted for the continued industrial expansion of this region, which will result in a continued high rate of population growth. The regions many resources, its open ice-free ports well located on the main trade routes, its fine terminal facilities, abundant cheap power, and its mild climate make it an ideal industrial location, and more producers are coming to realize this as time passes.

These two provinces then, British Columbia and Alberta, appear destined for the larger internal migratory trends in the future. When the St. Lawrence Seaway project is begun, Ontario may also be expected to gain even more population by the increased industrial expansion created by the seaway.

Generally, since the turn of the century, the trend has been towards increased industrial expansion, and the related

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Appendix: table III.

rural-urban trend of population movement has been especially marked during the past two decades.[1] Hamilton, Ontario is a typical Southern Ontario manufacturing center which bears out these population trends very well. A study of the maps, included in the appendix, will illustrate the rapid growth which is expected during the next two decades, found on the basis of the trend of the past two decades. Further, we also see the close correlation between urbanization and industrial expansion. This trend is typical for Canadian industrial centers which are located in close proximity with their market and supply areas, when both areas are large enough to support extensive industrial activity.

There is little reason to suppose that this rural-urban trend will diminish in the near future. Actually, this trend has continued at an increasing rate, even since the end of World War II. In Ontario alone, it is estimated that about 100,000 untrained agricultural workers are needed to work abandoned farmlands.[2] From the point of view of Ontario manufacturers, however, this was not bad inasmuch as it aided them in their efforts to make a quick post-war reconversion to domestic production.

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1. Appendix: tables III and IV.

2. K. W. Taylor, "What lies ahead for Canada?" Hamilton Spectator, Hamilton, March 30th, 1950, p. 36.

Recent attempts to settle immigrants on farmlands have not proven too successful. Many immigrants were willing to take up farming in Ontario as a permanent occupation, that is, until they were safely within Canadian borders, when they too joined the ranks of the unionists and added to the disorganization which we now have on the manufacturers' labour scene.

While it is risky to attempt an estimate of the number of immigrants which will come into the country, it does not seem unreasonable to expect that the population will double within the next half-century, as has been commonly supposed.[1] This increase will be beneficial if it is properly distributed within the various branches of the economy. It will expand the home market for Canadian production, thereby stabilizing the economy against disturbances of a serious nature during periods of depression. Even so, Canada will still be heavily dependent on foreign trade in order to maintain a rising standard of living.

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1. K. W. Taylor, loc. cit.

APPENDIX

TABLE I

Population of Canada, Census Years 1891-1941 with Density 1941

Province or Territory	Population				Land area sq. miles	Persons per sq. mile 1941
	1891	1911	1931	1941		
P. E. I.	109,078	93,728	88,038	95,047	2,184	43.52
N. S.	450,396	492,338	512,846	577,962	20,743	27.86
N. B.	321,263	351,889	408,219	457,401	27,473	16.65
Que.	1,488,535	2,005,776	2,874,662	3,331,882	523,860	6.36
Ont.	2,114,321	2,527,292	3,431,683	3,787,655	363,282	10.43
Man.	152,506	461,394	700,139	729,744	219,723	3.32
Sask.	--	492,432	921,785	895,992	237,975	3.77
Alta.	--	374,295	731,605	796,169	248,800	3.20
B. C.	98,173	392,480	694,263	817,161	359,279	2.28
Yukon	--	8,512	4,230	4,914	205,346	0.02
N. W. T.	98,967	6,507	9,316	12,028	1253,438	0.01
Canada:	4,833,239	7,206,643	10376,786	11506,655	3462103	3.32

Source: Dominion Bureau of Statistics, Canada 1949, p. 41.

TABLE II

Estimates of the Population, by Provinces, 1942-48.

Year	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yukon and N.W.T.
	'000	'000	'000	'000	'000	'000	'000	'000	'000	'000
1942	90	591	464	3,390	3,884	724	848	776	870	17
1943	91	607	463	3,457	3,917	726	842	792	900	17
1944	91	612	462	3,500	3,965	732	846	818	932	17
1945	92	621	468	3,561	4,004	736	845	826	949	17
1946	94	612	480	3,360	4,101	727	833	803	1,005	24
1947	94	621	491	3,712	4,189	743	842	822	1,044	24
1948	93	635	503	3,792	4,297	757	854	846	1,082	24

Source: CANADA, 1949 Dominion Bureau of Statistics, ~~Canada 1949~~, p. 46.

TABLE III

Rural Farm, Rural Non-Farm and Urban Population, by Provinces

1931 and 1941

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Province	1931			1941		
	Rural			Rural		
	Farm	Non-farm	Urban	Farm	Non-farm	Urban
P.E.I.	54,903	12,690	20,385	50,732	19,975	24,340
N.S.	173,965	107,227	231,654	141,182	169,240	267,540
N.B.	178,494	100,225	128,940	163,067	150,011	143,423
Que.	743,598	317,458	1,813,606	823,791	398,407	2,109,684
Ont.	785,550	550,141	2,095,992	694,684	754,338	2,338,633
Man.	254,302	129,868	315,969	248,684	159,187	321,873
Sask.	561,407	69,473	290,905	513,279	87,567	295,146
Alta.	370,899	82,198	278,508	380,693	108,890	306,586
B.C.	100,244	199,280	394,739	100,810	273,657	443,394
Yukon	74	2,796	1,360	42	3,075	1,797
N.W.T.	nil	9,316	nil	nil	12,028	nil

Source: Dominion Bureau of Statistics, Canada, 1949, p. 42.

TABLE IV

URBAN CENTERS HAVING OVER 30,000 INHABITANTS, 1931 and 1941.

Urban center and Province	1931	1941
Montreal, Quebec	818,577	903,007
Toronto, Ontario	631,207	667,457
Vancouver, B.C.	246,593	275,353
Winnipeg, Manitoba	218,785	221,960
Hamilton, Ontario	155,547	166,337
Ottawa, Ontario	126,872	154,951
Quebec, Quebec	130,594	150,757
Windsor, Ontario	98,179	105,311
Edmonton, Alberta	79,197	93,817
London, Ontario	71,148	78,264
Halifax, N.S.	59,275	70,488
Verdun, Quebec	60,745	67,349
Regina, Sask.	53,209	58,245
Saint John, N.B.	47,514	51,741
Victoria, B.C.	39,082	44,068
Saskatoon, Sask.	43,291	43,027
Three Rivers, Quebec	35,540	42,007
Sherbrooke, Quebec	28,933	35,965
Kitchener, Ontario	30,793	35,657
Hull, Quebec	29,433	32,947
Sudbury, Ontario	18,518	32,203
Brantford, Ontario	30,107	31,948
Outremont, Quebec	28,641	30,751
Fort William, Ontario	26,277	30,585
St, Catherines, Ontario	24,753	30,275
Kingston, Ontario	23,439	30,126

Source: Dominion Bureau of Statistics, Canada 1949, p. 43.

EXPLANATION OF MAPS

The following maps are the result of a market survey, conducted by this writer during the summer months of 1948 on the behalf of a large Ontario and Quebec corporation. Methods of projection and certain data relevant to the study were considered by the corporation to be confidential, and consequently may not be presented in sufficient detail to justify the findings. Nevertheless, we considered the maps to be of sufficient interest to this study to include them.

The city limits of Hamilton, as illustrated on the maps, are as follows:

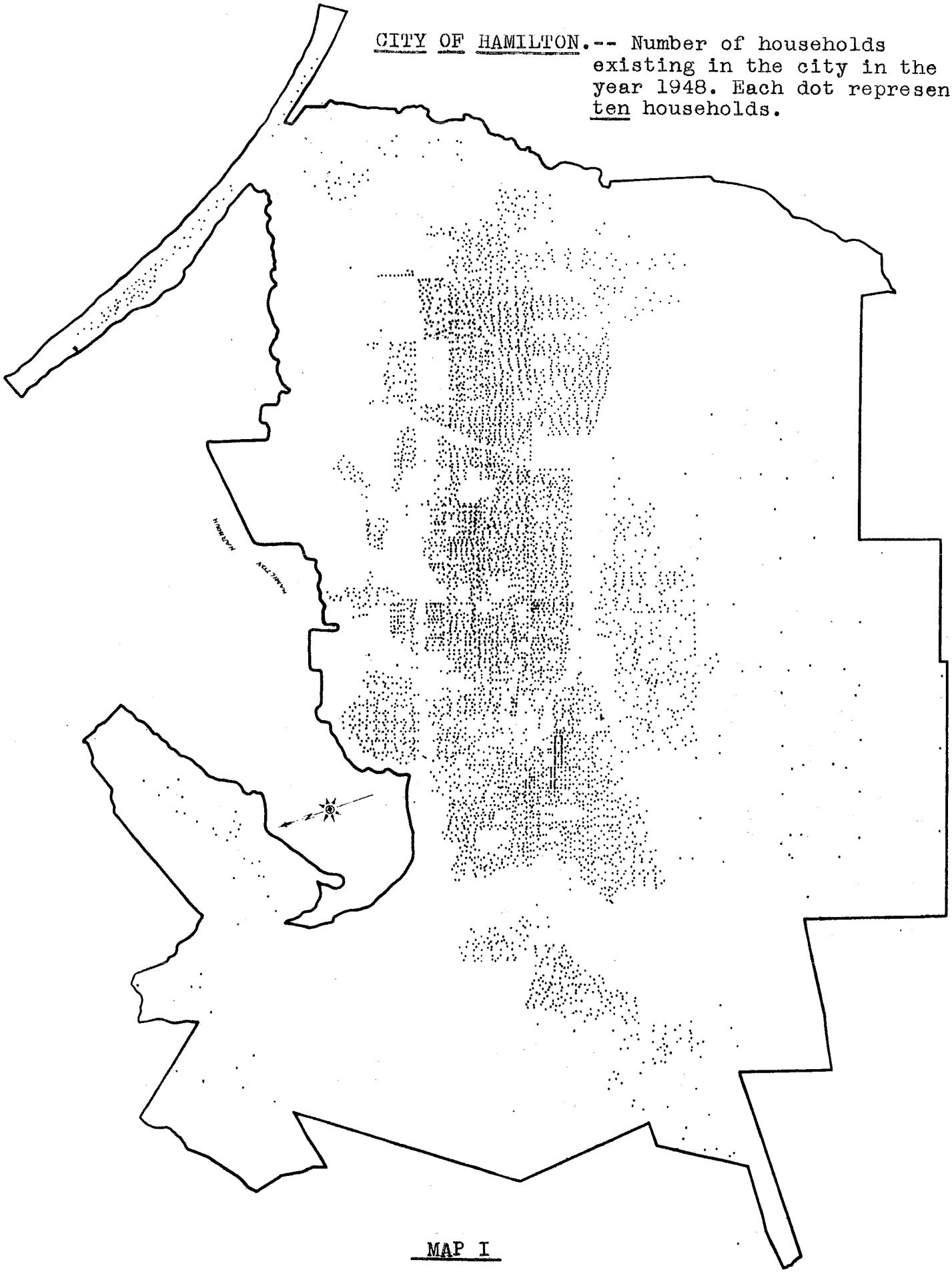
- the northern boundary is the shoreline of Hamilton Harbour;
- the northeastern boundary includes the annexed portion of Burlington Beach to the eastern side of the canal, and is now known as Hamilton Beach;
- the eastern boundary is the Saltfleet Township boundary line;
- the western and southwestern boundary is at the line of the Townships of West Flamboro and Ancaster respectively;
- the southern boundary on the escarpment includes the section of the Township of Barton extending to the north side of the Stone Church Road.

The two estimate maps are essentially projections of a trend derived on the basis of two previous market surveys of Hamilton, each covering a twenty year period. The size of the sample taken varied from a high of 33 p.c. to a low of 25 p.c. Hence the results could be expected to be reasonably accurate.

During the winter months of 1948 - 1949, the data were compiled by a highly competent staff into tables and graphs, and interpolated onto a master map, ten feet long and six feet wide. The maps on the following pages are condensations of the master map. Some appreciation of the accuracy of this project may be gained by the realization that, if the following three maps were on sheets of celluloid, instead of linen, and if these sheets of celluloid were placed one on top of the other so that the outlines of the city limits coincide on each of the three maps, then it would be seen that no two dots on any of the three coincided.

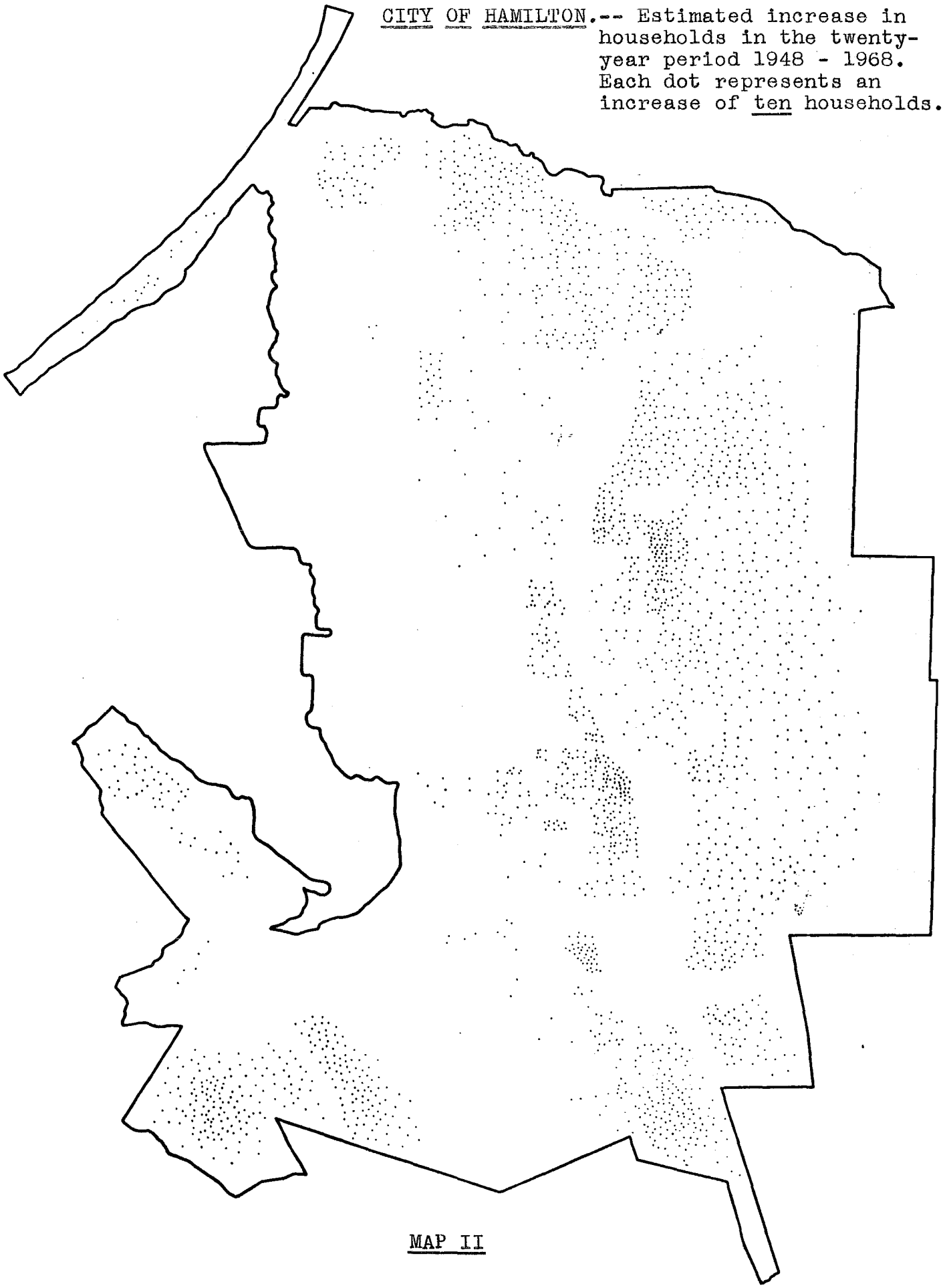
These maps illustrate some of the more recent migration trends. Map II shows the extent to which the city may be expected to grow and Map III shows the probable increase in industrial space which will be taken up within the next twenty years. This bears out the contention that industrialization is exerting a strong pull ~~on~~ towards the urban centers. This has been especially evident in Ontario during the past decade. Map III also shows those areas of the city which are considered to be particularly preferential for the location of industry; this is the land for which the higher prices will be paid. Map II is also illustrative of the general tendency of the labour force to group quite closely to the processing center. Map II shows the popularity of the urban-suburban movement which has been gaining in importance during the last decade. This movement is illustrative of the general desire of people who can afford to do so, to move to the outskirts of the city

in order to escape high taxation levied on the more desireable types of property. This trend also evidences the general desire to avoid the undesireable social conditions which are particularly evident in some of the older sections of the city.



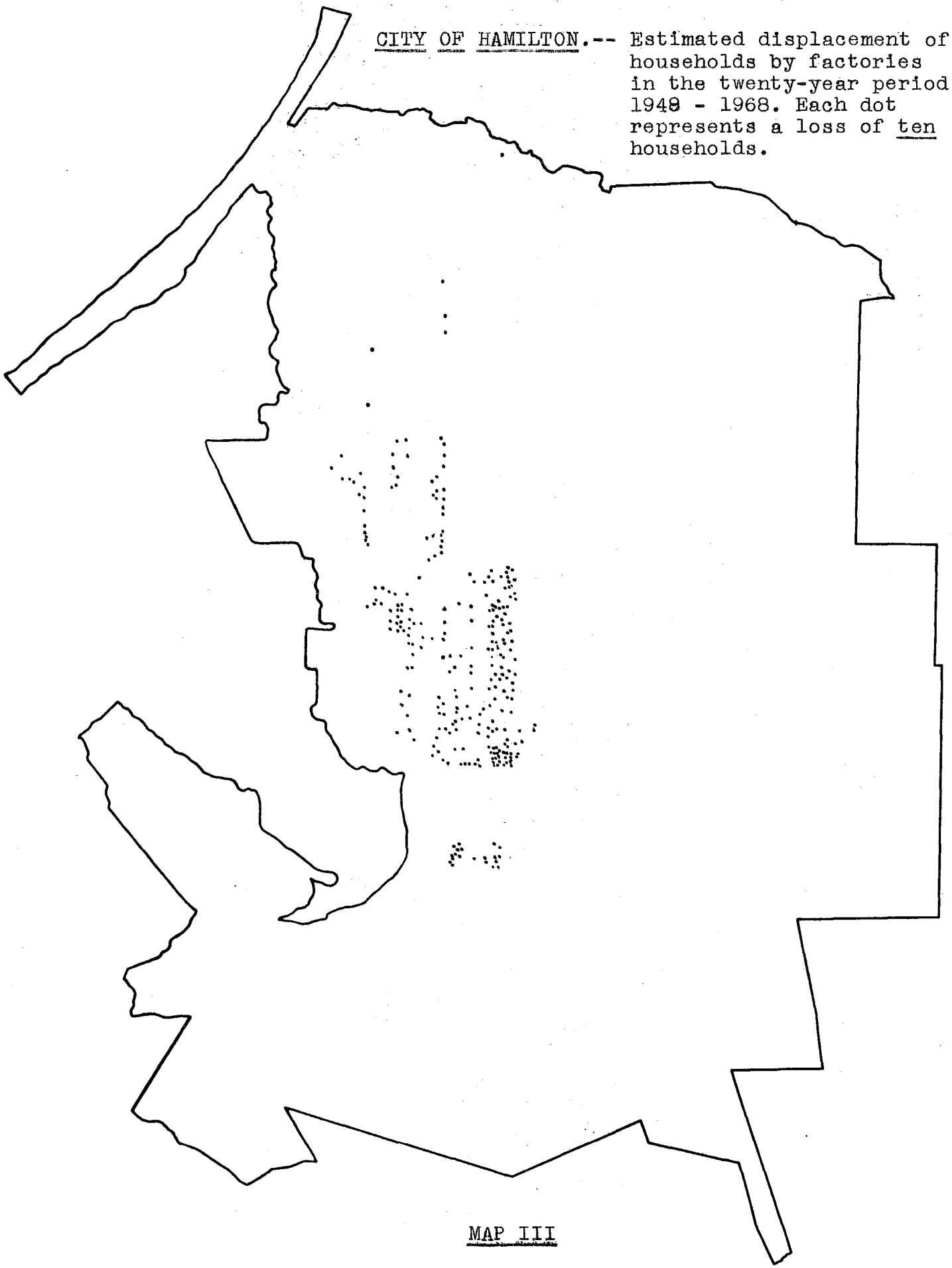
CITY OF HAMILTON.-- Number of households existing in the city in the year 1948. Each dot represents ten households.

MAP I



CITY OF HAMILTON.-- Estimated increase in households in the twenty-year period 1948 - 1968. Each dot represents an increase of ten households.

MAP II



CITY OF HAMILTON.-- Estimated displacement of households by factories in the twenty-year period 1948 - 1968. Each dot represents a loss of ten households.

MAP III

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