

LOSING STEAM
STRUCTURAL CHANGE IN THE MANUFACTURING ECONOMY
OF BRITISH COLUMBIA 1860-1915

by

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ABSTRACT

This thesis attempts to revise the existing historiography of British Columbia by first, establishing the growth and presence of a significant and diversified manufacturing sector between 1860 and 1890 and second, by charting the relative and absolute decline of the secondary manufacturing sector between 1890 and 1915.

It adds to the literature which argues that British Columbia has been an industrial society since before the 1880's. Even by 1890 a higher percentage of British Columbians were engaged in manufacturing than elsewhere in Canada and output per capita in British Columbia exceeded that of any other province. Comparing total manufactured output, British Columbia moved from the seventh largest producer to third among Canadian provinces in the three decades after 1880. Through the whole study period British Columbia factories tended to be larger than their counterparts elsewhere in Canada.

The core of the thesis describes the manufacturing sectors of British Columbia, both primary and secondary, at an aggregate level utilizing census, directory, tax, and credit data. In attempting to account for the pattern of growth and decline it considers the two main approaches to Canadian political economy, the export base (staple) approach and the dependency approach and concludes that a third, "production system," approach inspired by recent work in economic anthropology provides a better framework to discern the causal factors.

Utilizing the production system framework this thesis explores some of the reasons for the decline of the secondary manufacturing sector after 1890 by using one of the central industries, the boiler and engine industry, as a case study. The thesis identifies three factors that were important in explaining the decline of the boiler and engine industry: discriminatory railway rates, high labour costs and, the transfer of

ownership of much of the economy from local to non-local capitalists. This thesis reveals that although regional manufacturers were responding to the relative prices of transport and labour, these prices were the product of the interaction of social and institutional factors located both within and without the region. The third factor, the shift of ownership outside the region, is an example of how structural changes affect the whole economy.

These three factors also point to a revised understanding of how regional industries are linked to one another and how frontier regions or "peripheries" are linked to the metropole. The increasing amount of ownership of the resource extractive, primary processing and transportation industries by non-locals meant that linkages that formerly connected these sectors to local manufacturers, were transferred outside the region. The thesis concludes that these linkages are socially, rather than technologically defined.

The thesis argues that the de-industrialization of British Columbia was one aspect of a larger process which, viewed from central Canada, has been called "centralization". Set in a global context the British Columbia experience was one part of an international process which saw industry concentrate in other regions like southeastern Ontario, the American northeast, and parts of Great Britain as it left regions which then became the "periphery".

Examiners:

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Chapter 1

Introduction

By the 1890's the west had started to shrink. It had started noticeably to shrink by the time the first locomotives made the turnaround at Port Moody. Now or rather then it shrank with every word that was sent back from the dry country across the mountains and the Atlantic Ocean. Some of the west spilled northward for a while and seemed to be expanding to its original size, but there too it would shrink until the west became small enough to fit into eastern plans, to become a region in the eastern scheme of things.

George Bowering
*Caprice**

If you lived in British Columbia in the late nineteenth century, you were likely to have worked in a factory. More British Columbians were engaged in the manufacturing process than in any one of logging, fishing, mining, or agriculture. You were more likely to be working in a factory than if you had lived anywhere else in Canada. Moreover, that factory was on average, larger in terms of employees, capital, output, or most other measures, than anywhere else in Canada.

This thesis is, first and foremost, a description of that "industrial" British Columbia and particularly of the secondary manufacturing industry. British Columbia's historians are only beginning to appreciate the fact that the history of British Columbia is predominantly an industrial one and that the people of British Columbia have been mainly industrial wage earners working in "factories".¹ This thesis addresses this aspect of British Columbia's history. It fills a gap which has inhibited our understanding of the economy and society of British Columbia through that critical period before the First World War when many of the industrial, class and race relationships which affect us today were established or consolidated.²

* George Bowering, *Caprice*, (Penguin: 1987) p. 108.

¹ For example see: R.A.J. McDonald, "Working Class Vancouver, 1886-1914: Urbanism and Class in British Columbia," *BC Studies*, Nos. 69/70 (Spring/Summer 1986): 69; Allen Seager, "Workers, Class, and Industrial Conflict in New Westminster 1900-1930," in *Workers, Capital and the State in British Columbia: Selected Papers*, ed. R. Warburton & D. Coburn (Vancouver: University of British Columbia, 1988) pp. 117-140.

² The continuity of economic structure and class relationships from the late 19th and early 20th centu-

This thesis documents the existence and the extent of manufacturing in British Columbia from 1860 to 1915 and discovers different patterns for the two different types of manufacturing. Primary manufacturing, processing the province's resources, started out very small and grew steadily to 1890 and then expanded exponentially to 1915, though it did not keep pace with the growth of the economy. Secondary manufacturing dominated the manufacturing sector until the 1890's when it slipped from its relative dominance. From the 1890's the secondary manufacturing sector grew more slowly than the economy. The production of some industries declined and others simply closed their doors. Important components of the secondary manufacturing sector experienced "de-industrialization" and the regional economy never recovered the diversity or the share of employment and output, accounted for by secondary manufacturing, that was lost in this era. British Columbia's relative lack of a manufacturing base is well known but there has been no recognition that this lack only dates from the turn of century.³

The discovery of the existence of a secondary manufacturing sector in British Columbia has implications for the historiography of the province. If indeed British Columbians experienced an "industrialization" and worked in factories like their contemporaries then historians must reconsider the concept of "western exceptionalism", the belief that the frontier developed distinctly from the "east", as it applies to British

ry is a common theme in British Columbia history: Robert C. Allen, "The B.C. Economy: Past, Present and Future," in R.C. Allen and Gideon Rosenbluth, *Restraining the economy: Social Credit Economic Policies for B.C. in the Eighties* (Vancouver: B.C. Economic Policy Institute, 1986) pp. 9-42; Richard E. Caves & Richard H. Holton, *The Canadian Economy: Prospect and Retrospect*, (Cambridge Mass.: Harvard University Press, 1959) 216-232; John Malcolmson, "Politics and the State in the Nineteenth Century," p. 20 and; Rennie Warburton and David Coburn, "The Rise of Manual Work in British Columbia," p. 224 both in *Workers, Capital and the State in B.C.*

³ The absence of a secondary manufacturing sector in British Columbia has been noted by: R.A.J. McDonald, "Victoria, Vancouver and the Economic Development of British Columbia 1886-1914," *British Columbia: Historical Readings*, ed. W.P. Ward and R.A.J. McDonald, (Vancouver: Douglas and MacIntyre, 1981) pp. 369-395; R.A. Shearer, "The Economy of British Columbia," in *Regional Aspects of Trade Liberalization*, ed. Shearer et al, (Toronto: Private Planning Association, 1973) pp. 3-42; L.D. McCann, "Urban Growth in a Staple Economy: The Emergence of Vancouver as a Regional Metropolis, 1886-1914," *Vancouver: Western Metropolis*. ed. L.J. Evenden, (Victoria: University of Victoria, 1978) pp. 17-42; Patricia Marchak, *Green Gold: The Forest Industry of B.C.*, (Vancouver: University of B.C., 1983); Phillip Resnick, "The Political Economy of British Columbia, A Marxist Perspective." *Essays in B.C. Political Economy*. ed. Paul Knox and Resnick, (Vancouver: New Star, 1974) pp. 3-12.

Columbia.⁴ The discovery of the relative decline of that sector prompts a search for an explanation and this thesis makes some preliminary steps in that direction, exploring in the process the strengths and weaknesses of the prevailing approaches to economic development in British Columbia.

The belief in "western exceptionalism" implies an isolation from the non-west but the study of the manufacturing economy of British Columbia demonstrates that it cannot be understood separate from the development of the rest of Canada, the United States, Britain, indeed, from the world economy. From the 1790's when furs from the British Columbia coast were first traded on the waterfront of Canton the regional economy has been attached to that of the world. Between 1860 and 1915 that attachment became increasingly obvious as transportation systems evolved and the world economy became even more closely integrated. A second objective of this thesis is to indicate some of the ties that linked British Columbia to *the east*, understood as eastern North America and Europe and examine how it is " *a region in the eastern scheme of things.*"

The understanding of how development and growth occur at an international or even a national level is a vital objective; but the larger the unit one studies the more aggregate the analysis must become. At a world level it is very difficult to distinguish causes of growth and development from results. Paradoxically, it appears that the most effective way to study the growth of the world economy is to first understand development at a regional level where different paths can be distinguished and the dynamics of economic change observed.⁵ People actually *live* in regions and their regional economy affects them more directly and more obviously than the national or

⁴ See for example: Stuart Jamieson, "Regional Factors in Industrial Conflict: The Case of British Columbia," *British Columbia: Historical Readings*, pp. 550-514. Resnick, "Political Economy of British Columbia," p. 5.

⁵ For this reason Scott and Storper refer to the "Primacy of Regional Analysis;" Allen J. Scott and Michael Storper, ed. *Production, Work, Territory: The Geographical Anatomy of Industrial Capitalism* (Lon-

international economies. The dynamics of economic systems are only understandable when they are viewed in a regional-spatial context because the possibilities for change are the results of the interaction between transnational systems of constraints and locally specific circumstances. Thus it is that while British Columbia's economic history cannot be understood separate from world economy neither can the world economy be studied without regional analyses such as this. A third objective then, is to study a specific articulation of a part of the process of world economic development and integration.

Regional analysis is not without its pitfalls and one of the most common is the "nativist" approach. This has been particularly true of the "Dependency" school and in Canada, its application to the Maritimes. The approach results in a *Them* (in Canada usually southern Ontario) versus *Us* (the region) polemic which seeks to place the "blame" for regional problems on forces outside of, or outside the control of the region itself. It is an *a priori* narrowing of one's investigation that has even led some "Marxist" theorists into championing the causes of local capitalists against "bad" foreign capitalists. The opposite extreme is represented by some users of the neo-classical model who ignore spatial/temporal/and human factors altogether and locate a region in purely economic terms. In this view high regional unemployment is not a problem if people have the sense to leave and go elsewhere where things are better. High regional unemployment has a human cost that transcends the neo-classical appellation "friction". This approach ignores the cultural and social components of a region.

The other pitfall is the tendency to make explicit or implicit comparisons with other regions which determine the questions we ask of the region we study. For example, the two major approaches to political economy in Canada, the neo-classical and the neo-Marxist until recently have both assumed that there is a development path that economies will *naturally* follow if there are no disturbing interventions. The

"path" leads inexorably to an economy and society modelled on the north-eastern United States and all regional economies succeed or fail according to this standard. Rejecting this or some other "standard" path for an economy implies a recognition that the basis on which one evaluates economic development is ultimately arbitrary. In the context of this thesis "development" is stripped of its value connotations and simply refers to structural change in an economy, as opposed to mere growth.⁶

The thesis is a description of the changing structure of British Columbia's manufacturing sector. Alternatively, it could have been an examination of an individual capitalist or labourer and his/her goals, skills, successes, failures within the setting of a single firm but it would still have had to come to grips with how that individual/firm fits into the structure of manufacturing in British Columbia, Canada, and the world. Either approach is legitimate. This one was chosen because, given the state of our knowledge it promised the most. It is difficult to locate individuals in structures that they themselves were unaware of, if we do not first have an understanding of the structures.

The structural approach also has the advantage of revealing that what makes local capitalists and local workers, *local*, is success. Workers who do not find work and capitalists who find no profitable opportunities for their capital, tend to move out of a region. Barring "success", or sensing better opportunities for success elsewhere, "would-be" locals would keep moving. The possibilities for success or failure are created by the structure. Examination of the "structure" through the eyes of individuals successful enough to leave a record behind them introduces yet another bias into our view of the past. This structural approach does not deny the important role of human agency -- individual initiative, but rather considers it one of several important

don: Allen & Unwin, 1986), pp. 13-15.

⁶ The "structure" of an economy is the network of power relationships which determine such elements as property rights, distribution of income, level of competition, concentration of ownership, amount of public re-

factors in the production system. Individual initiative appears in the production functions below subsumed within "entrepreneurial skill" and "labour".

The focus on secondary manufacturing is not to suggest that the resource industries and primary manufacturing were less important. From pre-historic days British Columbia's rich resources attracted and sustained the population. The argument developed below suggests that it is not the type of production, whether it be resource extraction, primary or secondary manufacturing, that is the critical factor in British Columbia's unique "development path". Rather it has been the interaction of the production relationships generated by the economic activity with the institutional and social frameworks in which production occurred.

The thesis is structured in such a way as to reflect and distinguish the different levels of abstraction contained within it. It examines the manufacturing sector on four different levels: the purely theoretical, the macro-economic, the meso-economic (a single industry), and it touches on the micro-economic (with the discussion of Albion Iron Works). The more abstract levels set the context for the more concrete.

This chapter introduces the rationale and guiding principles of this thesis while chapter two situates it in the theoretical literature on Canadian and British Columbian development. It examines the strengths and weaknesses of the Dependency and Export Base Approaches and concludes that a third, "Production System" approach, derived from economic anthropology, provides a more complete framework for the study.

Chapters three and four are descriptive. They establish the economic and historical background for chapters five through seven. Because of the importance of the resource base to the economy and the theoretical implications of "linkages" from the resource sector, chapter three is a description of the growth and development of the resource base. Chapter four examines the extent and importance of the whole

gulation, just to name a few on a long and complex list.

manufacturing sector, primary and secondary, from 1860 to the first census in 1880-1. Conceptually it is linked to chapters five and six but it utilizes different sources. It draws upon Credit Reports, Directories, colonial Blue Books, and tax rolls to extend our understanding of British Columbia manufacturing backward into the pre-census era.

Chapter five also takes both primary and secondary manufacturing as a whole to examine the industrial nature of the economy. Beginning with data from the first available census in 1881 it compares size, the diversity, and the average size of British Columbia manufacturing relative to Ontario and the rest of Canada. On a per capita, or a per firm basis, British Columbia was the most industrialized province in Canada in 1890 and 1900.

In chapter six the focus narrows to explore the changing structure of the secondary manufacturing sector, from 1880-1915. This chapter, with appendix six, illustrates both the modest growth in some sectors and the decline in others. The case of one of the declining industries, the boiler and engine industry, is the subject of chapter seven. It is at this specific level of investigation that the explanations for the general pattern of development can be tested and evaluated. Finally, in chapter eight an attempt is made to whip the various plaits of the argument into a conclusion.

Ultimately a study of the past takes place in the present and its value, if it has any, must also exist in relation to the present. The aim of this thesis is to improve the understanding of structural change in British Columbia's manufacturing sector and make a preliminary attempt at explaining the evolution of the British Columbia economy in a Canadian and world context. It is a preliminary contribution to what will hopefully be an ongoing process: explaining British Columbia's relative lack of secondary manufacturing and thereby revealing structural impediments to the contemporary expansion of that sector.

Chapter Two

The Political Economy of Manufacturing

Of course, as in the instance of alchemy, witchcraft and other such popular creeds, political economy has a plausible idea at the root of it.

*John Ruskin
"Unto this Last"*

During most of this century the discussion of economic change in Canada has been conducted in one of two main theoretical frameworks. The first, a view essentially rooted in neo-classical economics, has dominated the ring and dictated much of the policy of Canadian and British Columbian governments. It is known by several aliases, including the "staple theory" and the "export base approach" and is part of the more general "modernization approach".⁷ There were no obvious challengers until the 1960's and the arrival of the "dependency approach" based on neo-Marxist political economy. This model is also sometimes called the "staple theory" and as a result this phrase has become a source of confusion and something of a liability in Canadian political economy.⁸ This chapter sketches these two approaches and focuses on the path that each predicts the "evolution" of the manufacturing sector will follow. It examines the strengths and weaknesses of each and concludes that a third approach, a "Production

⁷ The "staple theory" has been used to refer to so many diverse concepts that it no longer has any utility; Theorists like Caves declared the approach compatible with a neo-classical "Vent for Surplus Model" and Gunder Frank declared it interchangeable with the "Dualist Model". Williams calls this approach the "Import Substitution Strategy". North calls it "Export Base Theory". See: W.A. Mackintosh, "Economic Factors in Canadian History," *Approaches to Canadian History*, ed. Carl Berger (Toronto: University of Toronto, 1979); R.E. Caves, "Vent for Surplus Models of Trade and Growth," *Trade, Growth and the Balance of Payments: Essays in Honour of Gottfried Haberler*, (Chicago: Rand McNally, 1965) 95-115; Andre Gunder Frank, *Dependent Accumulation and Underdevelopment*, (New York & London: Monthly Review, 1979), 111; Glen Williams, *Not for Export: Toward a Political Economy of Canada's Arrested Industrialization* (Toronto: McClelland & Stewart, 1983) 15-40, 130-150; Douglass North, "Location Theory and Regional Economic Growth," *Regional Development and Planning: A Reader*, ed. John Friedman & William Alonso (Cambridge: M.I.T., 1969) 240-253.

⁸ This is the version of the staple approach referred to by Marchak. She calls the export base approach, the "incremental growth" approach. When Watkin re-examines the staple model in 1979 the dependency version is the staple approach that he refers to. McCalla and George refer to the staple and dependency approaches as "near relations". Marchak, *Green Gold*, 1, 22; M.H. Watkins, "The Staple Thesis Revisited," *Canadian History Since Confederation* ed. Bruce W. Hodgins & Robert J.D. Page (Georgetown Ontario: Irwin Dorsey, 1979) 574; D. McCalla & P. George, "Measurement, Myth and Reality: Reflections on the Economic History of Nineteenth Century Ontario," *Journal of Canadian Studies*, 21, (1986), p. 74.

Systems Approach". based on the common production function implied in both approaches incorporates most of their strengths and few of their weaknesses.

The Export Base Model

The export base approach was first introduced to the Canadian scene by W.A. Mackintosh in the early 1930's. He, in turn, was inspired by the American, G.S. Callender. This approach holds that the export of raw materials is the best option for a "New Country" -- by which we mean the regions invaded and settled by the Europeans since the Sixteenth Century. Once started, an exchange of the new country's raw materials for the manufactured products of the older, central economies leads, in this view, to a progression of stages through which a new country must pass en route to a "mature industrialization".

In the settlement of new countries one problem takes precedence over all others - the problem of finding the staple product with a ready market. The world makes a path to the door of those regions fortunate enough to possess such a product, and all commodities of other countries are offered in exchange.⁹

Of course, this approach assumes that the economies of the United States and Great Britain are the standards to which all economies ought to naturally move, and that movement can be measured in terms of Gross National Product (GNP).¹⁰

While Mackintosh's approach has been hailed as part of "Canada's most distinctive contribution to political economy,"¹¹ it is actually quite compatible with a more general and widespread approach to regional growth in the social sciences. This approach, which I have termed the "Modernization Approach," a term generally used in the sociology literature, is also commonly called "Diffusionist" or "Incremental Growth". The two approaches are compatible in the sense that they both assume

⁹ W.A. Mackintosh cited in Carl Berger, *The Writing of Canadian History* (Toronto: Oxford University, 1976), 92.

¹⁰ North discusses some of the problems of using GNP as a measure of economic development in Douglas North, "Conference Summary," in L.R. Fisher and E.W. Sager, ed. *Merchant Shipping and Economic Development in Canada*, (St. Johns: Memorial University, 1982).

¹¹ M.H. Watkins, "The Staple Thesis Revisited," 574.

economies will move progressively towards to a state where they have a diversified manufacturing base. The compatibility of Mackintosh with the work of W.W. Rostow, "a vulgar extreme of the modernization approach and its 'progress' orientation"¹² has been noted by Williams and Stabler.¹³

In the Mackintosh variation this thesis suggests that while development may initially occur in a single staple sector eventually the "linkages" from this leading sector will generate economic activity in the lagging sectors via "diffusion" or "trickling down" effects.¹⁴ Between nations or regions, the diffusion of growth is a result of an 'advanced society' requiring the natural resources of a less developed region and the natural tendency of profits and wages to equality. Given the appropriate staple this approach holds that all newly settled regions will become developed. A "developed country" is one with a:

...high income per capita. It has a 'balanced' economy, with a manufacturing sector grown to thrive side by side with agriculture and other primary production. Manufactured goods are important exports and the country is self sufficient in a significant proportion of the goods it uses. In brief the developed country is one such as the United States, Great Britain, France, Germany, or the Scandanavian countries.¹⁵

Douglass North's "export based growth model", a derivative of the modernization approach, is more rigorously defined in terms of neo-classical economics than Mackintosh's.¹⁶ North broadens the approach to include growth led by any export.

¹² Craig Lockhard, "Global History, Modernization and the World Systems Approach: A Critique," *History Teacher* V, 14, N. 4 (August 1981) 512n

¹³ Drache has commented on Mackintosh's faith in the "progressive" nature of capitalism. Williams, *Not for Export*, 188n; J.C. Stabler, "Exports and Evolution: The Process of Regional Change," *Land Economics* XLIV, 1, 11-23; Daniel Drache, "Rediscovering Canadian Political Economy," *A Practical Guide to Canadian Political Economy* ed. Drache and Wallace Clement (Toronto: John Lorimer, 1978) 12-14.

¹⁴ Albert O. Hirschman, "Interregional and International Transmission of Growth," *Regional Development and Planning*, 623-641.

¹⁵ Caves & Holton, *The Canadian Economy: Prospect and Retrospect*, v. Lately economists have shied away from specifically defining "developed" but in most of the literature it is clear that this remains the model. This is more obvious in the social sciences and history, see Lockhard, "Global History...."; Drache argues that the United States was definitely Mackintosh's prototype, see Drache, "Rediscovering..." 13.

¹⁶ Although North credits Innis for inspiration it is clear that his model is more closely allied to that of Mackintosh. The latter credits the American economist G.S. Callender for some of the seminal ideas and in the American literature this approach is sometimes called the Callender-North Model, see: Diane Lindstrom, *Economic Development in the Philadelphia Region, 1810-1850*, (New York: Columbia, 1978) 5; On the unity of Mackintosh's staple approach and North's export base Model see John M. Brazzel & W. Whitely Hicks, "Ex-

staple or manufactured. North and Mackintosh's approach is distinguished from the more general modernization approach in that the stages in the North American version are different to take into account the absence of a pre-existing self-sufficient economy (the economy of the indigenous population is not considered); the former approach emphasizes the role of demand as the push factor in the growth process and the latter emphasizes the role of the supply side.

The Mackintosh/North variant of the modernization approach is an attempt to examine the process of capital formation in new regions. According to the theory's assumptions, the new region is sparsely populated and has had no prior capitalist development¹⁷ so "typically the (initial) capital for new region comes from the outside."¹⁸

North argues that:

to the extent that the export base is profitable, a part of this income will be reinvested in the expansion of the base...up to a point, and then the accumulated capital will tend to overflow into other activity.¹⁹

There is some debate about whether the export base is a model of regional growth or just national growth. Calling this approach the 'staple theory' Caves & Holton argue that it applies to either:

one great advantage of the staple theory is that it can be used to explain not only the growth of the nation but the growth of regions within the nation as well...

...the staple theory is useful in understanding the growth of regions of all sizes in the present-day world.²⁰

ports and Regional Economic Growth: An Evaluation of the Economic Base and Staple Models," *Land Economics* XLIV, 4 (November 1968) 502-9; on the compatibility of the export base approach and orthodox neo-classical economics see: A. Guccione and W.J. Gillen "Export Base and Neo-classical Type Models of Urban Growth A Synthesis," *Canadian Journal of Economics*, XIII, 4, (November 1980) pp. 700-711.

¹⁷ Watkins, "Staple Theory," 53,53.

¹⁸ North "Location Theory," 252; Caves, "Vent for Surplus..," 99. That this was so in B.C. see Ronald A. Shearer, "The Economy of British Columbia," *Regional Aspects of Trade Liberalization*, ed. Shearer *et al* (Toronto: Private Planning Association, 1973) 33.

¹⁹ North, "Location Theory," 252.

Tiebout adds that the smaller the region the more important will be the role of exports and the more powerful the export base theory will be as tool of regional analysis.²¹ Allen on the other hand argues that while a national economy will fit the export base pattern, individual regions will specialize and develop differently within the nation. This is also the implicit argument of Chambers and Gordon, and the responses to their work which consider the effect of the prairie wheat boom, not on the prairie economy so much as on the national economy.²² While the debate has not been conclusive there is no doubt that the export base model continues to be applied as an explanation of purely regional development.²³

The accumulation and overflow of capital into activities related to the export base are discussed in terms of "linkages". Forwardly linked industries refine the products of the export base, backward linkages prepare inputs for the export base, final demand linked industries are those which supply consumer goods to the labour force drawn by the export base and related linkages, and fiscal linkages are those which connect the government to the the export base.²⁴

Among the writers who have considered the development of Canadian manufacturing from the point of view of the export base approach are: Mackintosh, Firestone, Bertram, Dales, the early Watkins, Easterbrook & Aitken, Marr and Patterson, and

²⁰ Caves & Holton, *Prospect and Retrospect*, 141-142.

²¹ Charles M. Tiebout, "Exports and Regional Economic Growth," *Regional Planning: A Reader*, ed. Friedman & Alonso, 156-160. See also, James Gilmour, *Spatial Evolution of Manufacturing: Southern Ontario, 1851-1891* (Toronto: University of Toronto Department of Geography, 1972) pp. 5-9.

²² Allen, "B.C. Economy: Past, Present and Future," p. 23; Edward J. Chambers and Donald F. Gordon, "Primary Products and Economic Growth, An Empirical Measurement," reprinted in Douglas McCalla, ed., *Perspectives on Canadian Economic Growth*, (Copp Clark Pitman: Toronto, 1987) pp. 201-220;

²³ North, "Location Theory and Regional Economic Growth"; James N. Tattersall, "Exports and Economic Growth: The Pacific Northwest 1880 to 1960," *Papers and Proceedings of the Regional Science Association*, vol. 9, (1962) pp. 215-6 and Watkins, "A Staple Theory," Richard Pfister, "External Trade and Regional Growth: A Case Study of the Pacific Northwest," *Economic Development and Cultural Change*, II, (January 1963), pp. 134-151.

²⁴ Albert O. Hirschman, "A Generalized Linkage Approach to Development, with Special Reference to Staples," in Hirschman, *Essays in Trespassing, Economics to Politics and Beyond*, (Cambridge, 1981) p. 65.

Pomfret.²⁵ The writings of North, Caves, Thomas, and Brazzel & Hicks, Hirschman and Guccione & Gillen flesh out the compatibility of this approach with contemporary neo-classical economics.²⁶

In this tradition Nesbitt has considered the B.C. case within a well defined theoretical framework of manufacturing growth although his empirical work focuses on the 1960's. McCann has constructed a theoretical model of urban-industrial growth in a staple economy and uses the B.C. economy between 1886 and 1914 as an application of his model. Gilmour has examined the Ontario manufacturing experience within a rigorous theoretical framework for the period 1851-1891 and McCallum has considered the overall "economic development" in Quebec and Ontario up to 1870.²⁷

Other work written on patterns of economic change in B.C. within the same general framework but less valuable from a theoretical standpoint include Kaliski's and Hughes' study of B.C. manufacturing, which cover the same period as this thesis but eschew theoretical interpretation; McDonald has done the most thorough analysis of the B.C. economy in a short article on the shift in the relative roles of Victoria and Vancouver 1886-1914, although his work is more descriptive than theoretical. Also in

²⁵ Mackintosh, "Economic Factors in Canadian History." G.W. Bertram, "Historical Statistics on Growth and the Structure of Manufacturing in Canada, 1870-1957," *Canadian Political Science Association Conference on Statistics 1962-3, Papers*, Canadian Political Science Association, 1963. O.J. Firestone, "Development of Canada's Economy, 1850-1900," *Trends in American Economic Growth in the Nineteenth Century Studies in Income and Wealth*, 24, (Princeton: National Bureau of Economic Research, 1960); J. Dales, "Estimates of Manufacturing Output by Markets 1870-1915," *Canadian Political Science Association Conference on Statistics, 1962-3, Papers*. Canadian Political Science Association, 1963; M.H. Watkins, "A Staple Theory of Economic Growth," *Approaches to Canadian Economic History*, ed. W.T. Easterbrook & Watkins (Toronto: Macmillan, 1979); this article was originally published in 1963, his later writings more properly belong in the dependency group; William Marr and Donald Patterson, *Canada: An Economic History*, (Toronto: Gage, 1980); Richard Pomfret, *The Economic Development of Canada*, (Toronto: Methuen, 1981).

²⁶ North, "Location Theory.,"; Caves, "Vent for Surplus Models of Trade and Growth;" M.D. Thomas, "The Export Base and Development Stages Theory of Regional Economic Growth, An Appraisal," *Land Economics*, XL, (1964), pp. 574-587; Brazzel and Hicks, "Exports and Regional Economic Growth;" Hirschman, "Interregional and International Transmission of Growth;" A. Guccione and W.J. Gillen "Export Base and Neo-classical Type Models of Urban Growth A Synthesis," *Canadian Journal of Economics*, XIII, 4, (November 1980) pp. 700-711.

²⁷ James G. Nesbitt, "Regional Differences in the Structure and Growth of Manufacturing in British Columbia," unpublished M.A. thesis, University of British Columbia, 1973; L.D. McCann, "Urban Growth in a Staple Economy: The Emergence of Vancouver as a Regional Metropolis, 1886-1914," *Vancouver: Western Metropolis*, ed. L.J. Evenden (Victoria: University of Victoria, 1978); John McCallum, *Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario until 1870* (Toronto: University of Toronto, 1980).

this vein is Caves & Holton's chapter on B.C. in their general study of the Canadian economy. Holmes, Ingram, Shearer, Phillips, and Howay, Sage & Angus are others who have considered the growth of the B.C. economy within this general framework but without much attention to, or modification of, the approach itself.²⁸

One of the key difficulties in testing the export base model has been the inability to agree on the mechanisms of the model with regard to specific cases. There is general agreement that a strong growing export base ought to stimulate secondary industry²⁹ although the degree of this stimulation is rarely specified.³⁰ Bertram suggests that:

Within the framework of the staple model of economic development, the secondary manufacturing industries' expansion could be regarded as a response to staple expansion in primary manufacturing³¹

Within this body of literature James Gilmour has presented the most rigorous framework in his study of the manufacturing sector in Ontario. He predicts that given a strong and growing resource base an economy will have a predictable constellation of linkages and will pass through a given set of stages or chronology. Gilmour's model relates to an economy based on an agricultural staple. Nesbitt develops the linkages

²⁸ John Logan Hughes, "Economic Development of British Columbia, 1858-1885," M.A. Thesis, University of California, 1927; Stephen Felix Kaliski, *The Growth and Development of Manufacturing Industries in British Columbia*. Unpublished Graduating Essay, University of British Columbia, 1952; R.A.J. McDonald, "Victoria, Vancouver and the Economic Development of British Columbia 1886-1914," *British Columbia: Historical Readings*, ed. W.P. Ward and R.A.J. McDonald (Vancouver: Douglas and MacIntyre, 1981); Caves & Holton, *The Canadian Economy: Prospect and Retrospect*, 216-232; H. Cuthbert Holmes, "Some Notes on the Economic Past, Present and Future of Vancouver Island," *British Columbia Historical Quarterly* XVI, 1&2; J.C. Ingram, "Industrial Development in B.C., Past, Present and Future," *Canadian Mining and Metallurgical Bulletin*, 51, 557 (September 1958) 580-5; Paul Phillips, "Confederation and the Economy of British Columbia," *British Columbia and Confederation*, ed. W. George Shelton, (Victoria: University of Victoria, 1967); 43-65. F.W. Howay, W.N. Sage, and H.F. Angus, *British Columbia and the United States*, (Toronto: Ryerson, 1942).

²⁹

...the pace and nature of economic growth and development are determined by the demand for and characteristics of the region's staple export.

Richard Pomfret, "The Staple Theory as an Approach to Canadian and Australian Economic Development," *Australian Economic History Review*, 21, (1981) p. 133; and Kris Inwood, "Economic Growth and Structural Change in Atlantic Canada, 1850-1910," in L.R. Fischer and Helge Nordevik, ed. *Across the Broad Atlantic: Essays in Comparative Maritime History*, (Oslo: Norwegian University Press, forthcoming) p. 19.

³⁰ Hirschman, "A Generalized Linkage Approach,"

³¹ Bertram, "Historical Statistics," p. 114; see also Inwood, "Economic Growth and Structural Change;" p. 19.

for non-agricultural staples.³² In most of the rest of the literature the steps an economy will move through are rarely explicit but close reading reveals a set of stages, which although not mechanical, provide a general way to test the model. All these theorists predict that over time the relative importance of the primary sector and primary manufacturing will decline.³³

The first stage commences with the introduction of a capitalist economy via the extraction and export of a natural resource product:

The closer we approach the first economic stirrings of the region, the greater the likelihood that the product of primary activity will be exported in unprocessed form.³⁴

Primary manufacturing may or may not occur at this stage depending on the relative cost of transporting the product in its raw form as opposed to semi-processed. Nesbitt suggests that at this stage the local sector will consist of a few retail and service industries because they typically require small levels of capital investment while they require close contact with the consumer.³⁵ Most theorists predict that there will be a strong backward linkage to the transport sector and significant investment will be made in establishing an efficient transportation link between the new region and the metropole.³⁶

The next stage is distinguished by the emergence of final demand linked industries in the consumer goods sectors "to serve the more urgent needs of the community

³² Nesbitt suggests discrete stages while Gilmour defines a chronology. Nesbitt, "Regional Differences in the Structure and Growth of Manufacturing in British Columbia;" Gilmour, *Spatial Evolution*.

³³ Gilmour suggests that the primary manufacturing sector (forward linkages) will start out negligible and may increase in relative importance in the initial years as economic organization becomes more sophisticated and development capital becomes available; after an initial rise in relative importance it will decline as time elapses; North, "Location Theory..." 253; Nesbitt, "Regional Differences..." 25; Gilmour, *Spatial Evolution...*, 31.

³⁴ Gilmour, *Spatial Evolution...*, 31.

³⁵ Nesbitt, "Regional Differences..." 27; Caves, "Vent for Surplus..." 100.

³⁶ Watkins, "The Staple Theory..." 55; North, "Location Theory..." 245,249,252; Gilmour *Spatial Evolution...*, 31; Mackintosh, "Economic Factors..." 13; Williams, *Not for Export*, 131.

for the bare necessities of life: food, clothing and shelter."³⁷ The products will require skilled labour or a lot of time in production (otherwise they would be made at home).

Production will be at a minimum scale of operation with each production unit supported by a small number of people. Many activities will, in fact, be represented by cottage industries, since...production requires little investment in either buildings or equipment.³⁸

Because little capital is available at this stage these manufactures would have few economies of scale in production, and as a result they would be items that are rarely traded inter-regionally. These would be industries like baking, soft drink bottling (aerated water), artificial ice making, and certain types of printing. Firestone and Gilmour suggest that this stage would include the homebuilding industry, clothing and footwear, and alcoholic beverages and that the next demand thresholds crossed will occur for some necessary consumer durables like furniture and stoves. As disposable income rises beyond the point where only necessities are affordable final demand linkages will broaden and the consumer sector will see a shift away from food, drink and clothing towards semi-durables³⁹ and a wider range of consumer durables.⁴⁰

Subsequently the economy should witness the appearance of industries backwardly linked to the export sector. This will result in a relative shift towards producer goods (which by definition are inputs to another productive process) and investment goods (which supply capital goods) and away from consumer goods:

At first, investment goods will consist of simpler types of goods such as foundry products.... The 'supplies to primary and tertiary sectors' will most likely develop in response to the rather more common and widespread needs of farmers and foresters for such goods as axes, dynamite, edge tools, etc.⁴¹

Most complex capital goods will continue to be imported "because the skills and capital

³⁷ O.J. Firestone, "Development of Canada's Economy, 1850-1900," 236.

³⁸ Quote from Gilmour *Spatial Evolution*, 33; see also Nesbitt, "Regional Differences...," 27.

³⁹ For a definition of which industries fit into these categories see Appendix 4.

⁴⁰ Nesbitt, "Regional Differences...," 27-28; Firestone, "Development of Canada...," 236-8; Gilmour, *Spatial Evolution...*, 33,37; Caves, "Vent for Surplus...," 101.

⁴¹ Quoted from Gilmour, *Spatial Evolution...*, 39; Nesbitt, "Regional Differences...," 29.

required for their production, as well as the market will still largely be lacking."⁴² Nesbitt suggests that some of the backwardly linked industries will take the form of unfinished producer goods, such as a can factory might be to the salmon canning industry but Gilmour argues that the relative share of unfinished producer goods will stay small at this stage because:

while the market is limited, the possibilities of realizing agglomeration economies are restricted...the low division of labour associated with the limited market eliminates many of the possibilities for the production of intermediate goods. ⁴³

Only a small share of the unfinished goods sector will produce consumer items because the final demand market is still very small and the latter necessarily precedes the former. The unfinished goods that do exist will:

mostly supply the more common consumer industries: for example blockmaking and engraving will supply the printing industry...; tanning will be related to boots, shoes, saddle and harness making and so on.⁴⁴

Further forward linkages may also be introduced at this point depending on the individual staple and the structure of transportation costs.⁴⁵

Over time the relative contribution of the primary manufacturing sector continues to fall and the contribution of industries which benefit from agglomeration economies climbs (ie. consumer durables and finished and unfinished producer goods). The primary sector gradually ceases to be the main engine of growth for the economy. Import substitution begins to occur even where transport savings are not a large consideration, such as in the refining of imported sugar. Thereafter "a well developed secondary manufacturing sector serving domestic and possibly even foreign markets

⁴² Gilmour, *Spatial Evolution...*, 39.

⁴³ Nesbitt, "Regional Differences...", 35; Gilmour, *Spatial Evolution...*, 34.

⁴⁴ Hirschman, "Interregional...", 121; Gilmour, *Spatial Evolution...*, 39.

⁴⁵ McCann argues that these will be "minimal because the centre usually requires staple commodities chiefly as inputs for its own industrial base," McCann, "Urban Growth in a Staple Economy," 27; Nesbitt, "Regional Differences...", 34.

will emerge."⁴⁶ Nesbitt suggests that this stage will witness the establishment of the most capital intensive industries: unfinished goods such as steel mills, oil refineries, etc...⁴⁷

The ultimate stage, the mature industrialization which we associate with the northeastern United States, will witness the dominance of producer goods sector.⁴⁸ In particular, over stages four and five the economy will witness a relative increase in the share of the unfinished component of the producer good sector. The unfinished producer good component is the stumbling block that:

keeps down the relative importance of the producer goods and maintains the supremacy of consumer goods during the early stages of development.⁴⁹

Primary manufacturing falls to a minor role and largely serves the building and other needs of the local economy.

The staple base becomes indistinguishable and the region is exporting highly manufactured goods from industries which originally grew up to serve the local population.⁵⁰

This then forms the "export base model" of the development of manufacturing sector in a newly settled region.⁵¹

Problems with the Export Base Model

In spite of its continuing popularity the export base approach has encountered a number of difficulties in explaining or predicting growth in concrete historical or con-

⁴⁶ Watkins, "Staple Approach", p. 64.

⁴⁷ Nesbitt, "Regional Differences...", 36-7; Gilmour, *Spatial Evolution...*, 33.

⁴⁸ "...we associate maturity with a dominance of producer goods." Gilmour, *Spatial Evolution...*, 40;

⁴⁹ Gilmour, *Spatial Evolution...*, 3,40.

⁵⁰ North, "Location Theory...", 252-3; this definition of the final stage is agreed upon by most of the export base theorists regardless if they have devoted much attention to the intermediary stages. See Nesbitt, "Regional Differences...", 38; Gilmour, *Spatial Patterns...*, 40; McCann, "Urban Growth...", 27; A.D. Scott, "Policy for Declining Regions: A Theoretical Approach," *Areas of Economic Stress in Canada*, ed. W.D. Wood & R.S. Thoman (Kingston, Ontario: Industrial Relations Centre, 1965) 81.

⁵¹ The progression is also laid out in more general terms by W.G. Hoffmann, *The Growth of Commercial Enterprises*, (Manchester University Press, 1958) chapter 7.

temporary situations. A search for an explanation for these failures turns up a variety of problems which range from conceptual cloudiness, to inconsistent premises, to a realization that the export base approach assumes a given institutional framework while what is important in economic development is changing institutional frameworks.

Central to both the export base approach and the dependency approach, discussed below, is the concept of "linkages".⁵² But close reading reveals that the term "linkages" is used with at least two distinct definitions and the shift from the use of one to the other has created a conceptual haze in the literature. The first and more precise definition of a linkage is found in Watkins and Hirschman:

...investment generating forces that are set in motion, through input/output relations, where productive facilities that supply inputs to that line or utilize its outputs are inadequate or non-existent.⁵³

In this formulation a linkage is a "propensity" of the specific characteristics inherent in a staple product to attract investment into related manufacturing activities *in the developing region*.⁵⁴ The other, more common, use of the term "linkage" occurs in the writings of the same authors and is illustrated in the two passages below:

the principal reason why it is difficult to establish backward and forward linkage industries around the staple is not so much that...there are fewer linkage effects in agriculture than in industry, but that they largely point to industries whose technologies are alien to the grower of the staple. Hence for a long time these [linked] industries are carried on abroad.⁵⁵

'Backward Linkages' refers to the production of machinery and other supplies used by the resource industry.⁵⁶

In the second usage "linkage" is no longer a propensity of a staple to attract investment

⁵² These are sometimes called "spread effects" or "multiplier effects", see Tattersall, "Exports and Economic Growth," pp. 215-6 and Watkins, "A Staple Theory,".

⁵³ Hirschman, "A Generalized Linkage Approach," p. 65; Watkins defines linkages more simply as "a measure of the inducement to domestic inducement." Watkins, "Staple Theory..," 55.

⁵⁴ Hirschman, "Generalized Linkage Approach," p. 72.

⁵⁵ *ibid.*

⁵⁶ Marchak, *Green Gold*, p. 8.

into the region based upon its characteristics and production function; rather it merely expresses a physically and technologically defined relationship between suppliers and consumers of input/output. The two definitions, although used interchangeably in the literature have different analytical implications.

In the latter case all industries have linkages and it is impossible to define positive or negative, strong or weak linkages. "Linkages" used this way, tell us nothing about regional growth unless we examine the questions of where these linkages will physically locate. The first usage, that of a linkage as the propensity of a staple to induce local investment, is conceptually more interesting; but because "propensity" has proved impossible to measure the literature has been forced into a *post hoc ergo propter hoc* fallacy.⁵⁷ Since "propensity" is impossible to measure we measure the degree to which various staples have been accompanied by investment in related manufacturing activities and assume a causal connection.⁵⁸ Hence a "staple with strong linkages" is one that now-developed regions once had.⁵⁹

The *post hoc* theorizing and multiple definitions of linkages have led to confusion and contradiction in the literature which at times reach comic proportions. Hirschman has pointed out that in Cuba tobacco had strong linkages and therefore is a good staple while sugar cane has had weak linkages. In Columbia tobacco has had weak linkages and coffee strong ones, while in Brazil sugar cane once again had bad linkages and coffee good ones.⁶⁰

⁵⁷ "After, therefore because of".

⁵⁸ Brazzel and Hicks, "Exports and Regional Economic Growth," p. 505,8; Kenneth Buckley, "The Role of Staple Industries in Canada's Economic Development," *Journal of Economic History*, (December 1958) pp. 439-50.

⁵⁹ This circular reasoning is unwittingly illustrated by Perloff and Wingo, "a good resource for a region can be identified, first, by its ability to support an extensive stream of nationally wanted production" in Harvey Perloff and Lowden Wingo, "Natural Resource Endowment and Economic Growth," in *Regional Planning, A Reader*, pp. 215-239; the *post hoc* nature of export base theorizing is noted by John Fogarty, "Economic History and the Limits of the Staple Theory, in Terry Cowley, ed., *Clio's Craft: A Primer of Historical Methods*, (Copp Clark: Toronto, 1988) p. 184; and Hirschman, "Generalized Linkage Approach," p. 85.

⁶⁰ As he points out the relationship between these paired relationships is actually transitive; see *ibid.*, p.

Beyond the confusion about which specific staples have good or bad linkages there are also contradictions as to what characteristics of staples imply strong linkages. For example, two of the seminal papers in this genre have argued that linkages depend not on the level of income generated by a staple but on its distribution. Galenson & Leibenstein argued that the more concentrated the distribution of income the greater the likelihood of reinvestment and therefore the stronger the linkages. Baldwin argued precisely the opposite: that an egalitarian distribution of income would generate a local consumer demand and therefore has stronger linkages.⁶¹ Tattersall argued that mechanized production processes refining the staple product would have a favourable effect on linkages while Hirschman argued that this type of processing actually had negative linkage effects.⁶² Caves and Galenson & Leibenstein disagree on whether capital intensity will have positive or negative effects on regional linkages.⁶³

These contradictory claims for staples, the characteristics of staples, and their effect on linkages have naturally aroused suspicion of the utility of the approach. The claims are however, not irreconcilable. It is conceivable that a certain staple will induce related investment under particular historical and socio-political conditions but retard development under others.⁶⁴ Acknowledging, in some degree, this problem North, Watkins and McCarty have specified the preconditions for the application of the model. They name a low man-to-land ratio, (in other words, not suffering from population pressure), vast amounts of natural resources, specifically, timber, fish, minerals or farmland, the imposition of a capitalist economic framework immediately upon settlement, the early export of cash "crops", and a sparse or ineffective indigenous

91-2.

⁶¹ Walter Galenson and Harvey Leibenstein, "Investment Criteria, Productivity and Economic Development, *Quarterly Journal of Economics*, vol. 69, (August 1955) pp. 343-70; Robert E. Baldwin, "Patterns of Development in Newly Settled Regions," *Regional Development and Planning: A Reader*, 266-284.

⁶² Tattersall, "Exports and Economic Growth," p. 216; Hirschman, "Generalized Linkage Approach," pp. 71-5, 85.

⁶³ Galenson & Leibenstein, "Investment Criteria,,"; Caves, "Vent for Surplus,,".

⁶⁴ Hirschman, "Generalized Linkage Approach,,"; Fogarty, "Limits of Staple Theory,,".

population whose traditions are not strong enough to inhibit the imposed capitalist structure.⁶⁵ This however, has not solved the problem. Even the fairly homogenous "regions of recent settlement" which meet all the criteria have experienced different kinds and speeds of development with identical staples.⁶⁶ Clearly there are factors beyond the characteristics of the staples that determine development potential.

It has not escaped the notice of some export base theorists that some regions have been exporting staples for a long time without moving along the stage progression. Any cases of a failure to grow are either treated as a result of something exogenous to the model (ie. resource exhaustion, or demand shifts in the external market)⁶⁷ or are explained by reference to the theory of comparative advantage (sometimes referred to as international trade theory or the theory of comparative costs) and "location theory".⁶⁸ A close look reveals that location theory, used in this context, makes the analysis circular in a study period longer than a few years. For its part the theory of comparative advantage requires assumptions that are not only historically untenable but are also incompatible with the export base model's own assumptions.

The theory of comparative advantage is commonly summoned by the export base theorists as a rationale for long term unbalanced growth and specialization in those regions which do not progress much beyond the processing of primary products. The principle of comparative advantage is summed by Samuelson and Scott:

Whether or not one of two regions is absolutely more efficient in the production of every good than the other, if each specializes in the products in which it has a comparative advantage (the greatest relative efficiency) trade will be mutually profitable to both regions.⁶⁹

⁶⁵ British Columbia, incidentally, meets all these pre-conditions and approaches McCarty's definition of a "pure" staple region as closely as any of the alternates he posits. North, "Location Theory..," 240; Watkins, "A Staple Theory..." 53; J.W. McCarty, "Australia as a Region of Recent Settlement in the Nineteenth Century," *Australian Economic History Review*, XIII, 2 (September 1973), 149-150.

⁶⁶ Fogarty, "Limits of Staple Theory," pp. 183-91.

⁶⁷ Other approaches, on the other hand, treat the demand and supply of the resource as internal to the model.

⁶⁸ "...the export base theory, is a result of work initiated by Douglass North and is an extension of location theory combined with aspects of international trade theory..." Stabler, "Exports and Evolution..," 11-12.

Since the production of natural resource products is land intensive, and newly settled regions have a large supply of land (or resources) relative to the longer and more densely settled metropole, this argument suggests that the new region has a comparative (and possibly absolute) advantage in staple production as opposed to manufactured goods.

The central role of this theory in the export base approach is acknowledged by North:

The development of an exportable commodity reflects the comparative advantage in relative costs of production....⁷⁰

The theory of comparative advantage is rooted in classical economics directed at explaining the trading relations of the central nations of Europe in a period of extreme economic nationalism. The theory, however, only works with the standard assumptions that "independent" producers within two "autonomous" regions will decide to specialize in individual commodities and both will benefit. The theory suggests that there will be absolute or comparative advantages in efficiency as a result of regional specialization. It does not attempt to explain who will benefit, or to what extent, in a given case from the efficiency gains. In the case of a newly settled region and its parent metropolis, a core part of the export base theory has established that much of the capital for the new country will come from the parent. Because capital is often accompanied by proprietary rights we cannot assume independent choice on the part of the new region.⁷¹ In general, the smaller the region, the larger will be the influence of imported capital. The comparative advantage will not necessarily operate to the

⁶⁹ Paul A. Samuelson and Anthony Scott, *Economics: An Introductory Analysis* (Toronto: McGraw Hill, 1966) 713-14.

⁷⁰ North, "Location Theory..." 245; McCarty makes the same point:

While the staple maintains its large comparative advantage over other countries and absorbs most of the capital and labour, it is cheaper to import manufactures and other goods than produce them locally."

see J.W. McCarty, "The Staple Approach to Australian Economic History," *Business Archives and History* IV, (1964) 7.

⁷¹ Baldwin, "Patterns of Development".

advantage of the developing region if the decisions about the commodity each will specialize in, are made in a parent economy. Instead the efficiency gains may accrue only to the metropolitan capitalists who appropriate the advantages of the regional specialization.⁷²

Perhaps even more problematic is that the theory of comparative advantage lacks a temporal component and hence cannot accommodate factor "flows". It is a theory of location not of growth. The theory of comparative advantage assumes that the endowments of the factors of production -- capital, labour and natural resources -- are fixed, or relatively immobile.⁷³ The export base theory on the other hand is a theory of factor migration which assumes that capital and labour are mobile and will move to a new region.⁷⁴ By resorting to the theory of comparative advantage we violate the assumptions of the export base theory. Because the theory of comparative advantage is static it accepts the distribution of resources and economic power as "given" at any specific time. McCallum, in his comparison of the industrialization of Ontario and Quebec unwittingly illustrates this:

Other things being equal, linkages from a new staple will tend to flow to the region with greater initial endowment. This may be for reasons of political power, but it is also likely that the economic advantages of larger local markets, more abundant capital, and possibly more advanced technology will confer cost advantages on the better endowed region.⁷⁵

The theory of comparative advantage does not address the question of why some regions have "greater initial endowment" or how endowments change.

Location theory is often invoked to account, in some measure, for these weaknesses because it is a theory of factor migration, particularly capital migration. Location theory attempts to predict the optimal location for firms who based on profit

⁷² Marchak, *Green Gold*, 17.

⁷³ Scott, "Policy..," 74-6; N.G. Butlin makes this point clearly in "Growth in a Trading World, The Australian Economy Heavily Disguised," *Business Archives and History*. IV, (1964) 138-142.

⁷⁴ Caves "Vent for Surplus,".

⁷⁵ McCallum, *Unequal Beginnings*, 116.

maximization seek the location with the best profit potential. Its primary focus is on transportation and distribution costs because classical theory expects wages and other factors of production to be everywhere equal, but the theory has been broadened to deal with imperfect conditions. Hence, it takes into account the lowest possible cost combination of labour, capital, transportation, entrepreneurial talent, amenities and other inputs as well as proximity to markets. Location theory is relied upon in the export base approach to explain the timing of the exploitation of natural products, the location of linked industries and the timing of the establishment of linked secondary manufacturing industries.⁷⁶ However, while North says the entire:

success of an industry in producing an exportable commodity can be understood in terms of the principles of location theory,⁷⁷

location theory is dedicated to explaining the behaviour of single firms at given moments in time and is inadequate for explaining changes in whole industrial sectors or even a single firm, over a long time span.⁷⁸ Nonetheless, that the British Columbia economy did not develop into a diversified manufacturing economy is commonly explained by reference to components of location theory.⁷⁹

Location theory, interwoven in the export base approach, argues that some local processing will occur and the extent of that processing will depend on 1) the level of transportation costs, 2) the market orientation of the product in question and 3) the level of wages in the new region. Again, however, the lack of a temporal component weakens the theory as a tool for historical analysis. For example, one of the factors

⁷⁶ Stabler, "Exports and Evolution..," pp. 16-18.

⁷⁷ North, "Location Theory..," 245; McCarty, "Australia as a Region..," 167.

⁷⁸ "Location decisions are always 'made at the margin' -- in the context of the traditional 'givens' of economic analysis -- the importance of sequence is emphasized" in Stabler, "Exports and Evolution..," p. 22; Peter J. Wylie, "When Markets Fail: Electrification and Maritime Industrial Decline in the 1920's," *Acadiensis*, XVII, 1 (Autumn 1987) pp. 77-8.

⁷⁹ See for examples: McCann, "Urban Growth..," 26; Shearer, "The Economy of British Columbia," 3-42; Holmes, "Some Notes on the Economic Past, Present and Future of Vancouver Island," 62-64; Ingram, "Industrial Development in B.C., Past, Present and Future," 580-5; McDonald, "Victoria, Vancouver and the Economic Development of British Columbia 1886-1914," 379.

that location theory considers independent of the analysis is the structure and level of the transportation costs. Here we recall that according to the export base theorists, the establishment of an efficient transportation system is one of the first linkages to occur in a staple economy, and that the capital to establish that system generally come from outside the region; usually from the metropolis that is interested in obtaining the staple.⁸⁰ If we allow for some degree of monopoly control in the metropole, for public funding, or for the existence of horizontally or vertically integrated companies (in other words relax the assumption of perfect competition) then we introduce the likelihood that the transportation rates which affect the new region, are not independent of control by firms that either a) import from the new region or b) export manufactured goods to the new region or c) governments with their own public policy objectives.

Another argument based on location theory is that many industries are market oriented and hence cannot locate in regions like B.C. because it does not contain large enough markets (population).⁸¹ However, Shearer points out:

Arguments based on the size of the local market are apt to be circular, at least in the long run, since...the growth and the size of population are themselves to be explained in a large part by factors relating to the location of economic activity.⁸²

Dales makes the same point, arguing that the size of a market cannot be cited as the determinant of a whole industrial sector in the same way that it can for the location of a particular factory.⁸³ A similar argument suggests that because of B.C.'s geographic position, the region is isolated:

on the periphery of the North American and world economies. It is almost like an is-

⁸⁰ McCarty, "Australia as a Region...", 167.

⁸¹

On the whole the local market was too small and too isolated by distance and freight rates for local industrialists to be able to compete with eastern and foreign manufacturers in the production of highly processed end products."

in McDonald, "Victoria, Vancouver...", 379; Shearer, "Economy of B.C." 36.

⁸² Shearer, "Economy of B.C." 36; having said this Shearer goes on to use location theory to explain the composition of the B.C. manufacturing sector.

⁸³ J. Dales, *Hydroelectricity and Industrial Development: Quebec 1898-1940* (Cambridge, 1957) Chapter 8.

land, cut off from world markets and sources of supply by a natural transportation border.⁸⁴

This is an example of the geographic determinism often found at the basis of locational arguments. The logic of this approach is subject to the same circularity as the arguments based on the size of the local market; in other words to explain that a region is poor because it is far away from rich regions assumes the precise point under investigation. On an empirical level this model ignores B.C.'s excellent access to the markets of the Pacific compared to most of North America⁸⁵ and it overlooks the success of nations like Japan. Arguably more remote from the North American market than B.C., Japan manages to import natural resources from B.C. and then export manufactured products based on these resources back to the central Canadian economy, via B.C.⁸⁶ The circular reasoning of this approach is ameliorated by restricting the time span under consideration because in the very short run markets are fixed. Location theory also assumes other institutional arrangements are fixed, for example the structure and level of transportation rates. Again, the shorter the time-span the more reasonable the assumption, but in the longer run it is these shifts in institutional arrangements that we seek to explain.

Douglass North, the founder of the export base approach, acknowledges that the inability of the export base model to cope with structural change is a major handicap. North pointed out that the neo-classical model ignores institutions (like governments, corporations, unions, etc...) in its assumption of no friction or transaction costs. He notes that in fact this category of costs makes up over half the present GNP of the United States, and by ignoring them the export base theory misses at least half of the

⁸⁴ Shearer, "Economy of B.C." 36.

⁸⁵ Even in the 1860's the Pacific was a promising market and British Columbia regarded to be advantageously situated; see, Alexander Rattray, *Vancouver Island and British Columbia...*, (London: Smith, Elder & Co., 1862) pp. 96-118.

⁸⁶ Wylie makes a similar case in response to this argument applied to the Maritimes in "When Markets Fail" pp. 77-8.

economic activity in any region. North's critique goes further. The export base model excludes those variables that are critical to understanding the process of change:

The neoclassical model assumed that the private and social costs and benefits were equal. In fact they are not equal, they never have been, and they never will be. The difference between them is at the very heart of the way in which exchange takes place;

We must understand property rights, and how they are defined, specified, and the role of the state in this process, if we wish to understand how economic exchange takes place and how the process of exchange itself changes over time.⁸⁷

The export base model even fails the test for value as a heuristic model: its ability to predict growth patterns. The model focusses on how the demand for an export staple will, through linkage effects, determine a region's development. Yet the differences between the development of Canada, Australia and Argentina all of which had wheat as an export staple suggests that the explanation lies outside of the structure of demand and hence outside of the model.⁸⁸ In fact most export base theorists acknowledge the fundamental role of culture and institutional frameworks but with Watkins who considers that "the economist generalizes about cultural values at his peril," they usually consider them external to their models.⁸⁹ It is in response to many of these problems that dependency theory was taken up by Canadian political economists.

Dependency Theory and Its Problems

The term "dependency theory" throws a wide net which incorporates the intent of such models as Wallerstein's "World System Approach", Frank's "Development of Underdevelopment", Amin's "Dependent Accumulation" and Emmanuel's "Unequal Exchange". While this approach originates in writings about the stagnation in the economies of Latin America and Africa, the general approach has been applied to

⁸⁷ North, "Conference Summary," p. 232.

⁸⁸ Fogarty, "Limits of the Staple Theory," p. 189.

⁸⁹ Watkins, "A Staple Theory," p. 57; Stabler, "Exports and Evolution..." p. 22; Caves, "Vent for Surplus," p. 113.

Canada. In many respects the thesis is compatible with Harold Innis's Staple Approach which was introduced in Canada in the 1930's.⁹⁰ This approach is currently shared, in its conclusions, if not its mechanics, by a collection of Canadian scholars whom Drache calls "the New Political Economists"; these include the more recent writings of Watkins, and those of Naylor, Laxer, Acheson, Veltmeyer, Antler and in the B.C. context, Resnick and Marchak. The dependency theorists are a diverse lot with different views on the mechanics of the dependency process and particularly over the question whether or not the approach is grounded in Marxist theory.⁹¹ Most would probably feel comfortable with the label of neo-Marxist. A more self-consciously Marxist approach has been taken by Warburton & Coburn in the British Columbia case and by Wood with regard to the Maritimes.⁹² But, however they get there, dependency theorists all agree that new regions will not "progress" to the point where their economic structure is similar to, or their economic power is comparable to the "metropolitan countries".

Like the export base approach, the dependency approach is based on a metropolitan-hinterland relationship between nations or regions. Both approaches also agree that it is desirable to have a diversified manufacturing sector in an independent regional economy.⁹³ The difference lies in that the export base approach assumes a normal progressive development of all regions while the dependency approach assumes

⁹⁰ See Watkins, "Staple Thesis Revisited;" Marchak, *Green Gold*, 21-5.

⁹¹ For a summary of these debates see Magnus Blomstrom and Bjorn Hettne, *Development Theory in Transition, The Dependency Debate and Beyond: Third World Responses* (Zed Books: London), 1984; Eric W. Sager, "Dependency, Underdevelopment, and the Economic History of the Maritime Provinces," *Acadiensis*, 17 (Autumn 1987) pp. 117-137; Phil Wood, "Marxism and the Maritimes: On the Determinants of Regional Capitalist Development," a paper delivered to the Atlantic Studies Conference, Edinburgh, 1988; Michael Clow, "Politics and Uneven Capitalist Development: The Maritime Challenge to the Study of Canadian Political Economy," *Studies in Political Economy*, 13, (Spring 1984) pp. 117-140; Henry Veltmeyer, "A Central Issue in Dependency Theory," *Canadian Review of Sociology and Anthropology*, 17, 3 (1980) 198-213; Anthony Brewer, *Marxist Theories of Imperialism: A Critical Survey*, (London, Boston & Henley: Routledge & Kegan Paul, 1980).

⁹² Although their approach is grounded in "relations of production" Warburton & Coburn stress the importance of gender and ethnic conflicts: Rennie Warburton and David Coburn, ed. *Workers, Capital and the State in British Columbia: Selected Papers*, (Vancouver: University of British Columbia, 1988); Wood, "Marxism and the Maritimes".

⁹³ See Frank, *Dependent Accumulation and Underdevelopment*, pp. 131-3.

that only a few central regions will develop along the outlined stages; most new regions will be actively underdeveloped by "the centre" and held in the most primitive stage of the export base model. The dependency theorists argue that the gulf in the economic welfare of the two regions will widen over time. Underdevelopment is depicted as a historical process which is created by the relations of capitalism.⁹⁴

In the Canadian literature there are two main strands to this approach. The first approach, associated with Naylor, is termed the "Merchants Against Industry Approach":

Canada's dependency is a function not of geography and technology but of the nature of Canada's capitalist class. The Canadian business class has been dominated historically by financial capitalists who have made their profits in the exchange of Canadian staple products in return for manufactured goods imported from metropolitan countries.⁹⁵

The primary motor for underdevelopment in this approach appears to be the failure of the capitalist class to make the transition from investment in mercantile activity to industrial activity. Because Canada started with a staple producing economy "the group who control the export and import and the relations with the imperium are a mercantile class."⁹⁶ Because of the early dominance of merchant capital and backing from the metropolitan capitalists, both of which benefit from the exchange of raw material for manufactured goods, "the Canadian mercantile-financial capitalist class (is) in the very process of suppressing an indigenous industrial capitalist class..." But, as Watkins admits, "the mechanism of suppression needs specification." A parallel approach which emphasizes entrepreneurial failure as a cause for poor regional

⁹⁴ Henry Veltmeyer, "The Capitalist Underdevelopment of Atlantic Canada," *Underdevelopment and Social Movements in Atlantic Canada*, ed. Robert J. Brym & James R. Sacouman (Toronto: New Hogtown, 1979) 18.

⁹⁵ Jim Laxer, "Introduction to Canadian Political Economy," in Robert Laxer, ed., *Canada Ltd.: The Political Economy of Dependency*, (Toronto: McClelland & Stewart, 1973) 28-9.

⁹⁶ Tom Naylor, "History of Domestic and Foreign Capital in Canada," in Laxer, ed. *Canada Ltd.* 44-5; the following quotes are from M.H. Watkins, "Economic Development in Canada" *World Inequality*, ed. Immanuel Wallerstein (Montreal: Black Rose, 1975) 75, 80.

economic performance also exists in the orthodox export base approach.⁹⁷

The other main Canadian dependency model which is sketched out by Antler, I have termed the "Surplus Appropriation" strand. It attaches primary importance to the process of capital accumulation in, and drainage from, the colonial economy based on exchange relations.⁹⁸ This "Surplus Appropriation" strain is closely allied to that suggested by Resnick and Marchak for application to British Columbia and is reconcilable with the international dependency literature.⁹⁹

As in the export base model, the initial capital for the new region is attracted by rich deposits of natural resources. Large rents are earned which flow back to the foreign providers of capital. The difference between the dependency approach and the export base approach is that the former assumes that very little of the surplus will flow into a local manufacturing sector in the new region even if some of it does flow to the local population. Hence there will be no substantial development outside the export base:

Without respect to nationality of capital, the rents...tend to remain locked into resource exploitation and eventually leave the region that had the resources.¹⁰⁰

Most of the rent will flow to the foreign owners of capital who will have a tendency to keep reinvesting in that sector because of their familiarity with it.¹⁰¹ This tendency will be reinforced if the investors at the centre have any linkages with those firms that

⁹⁷ See, for example Roy George, *A Leader and a Laggard: Manufacturing Industry in Nova Scotia, Quebec and Ontario*, (Toronto: University of Toronto, 1970); Watkins, "A Staple Approach," pp. 56-7; Tattersall, "Exports and Economic Growth," p. 217.

⁹⁸ Steven Antler, "The Capitalist Underdevelopment of Nineteenth Century Newfoundland," in Robert J. Brym & James R. Saccuman, ed., *Underdevelopment and Social Movements in Atlantic Canada*, (Toronto: New Hogtown, 1979) 179-202.

⁹⁹ Resnick, "The Political Economy of British Columbia," p. 5. Marchak, *Green Gold*.

¹⁰⁰ Watkins, "The Staple Thesis Revisited," 580.

¹⁰¹ This is also acknowledged as a possibility in the neo-classical/ export base literature, see: Tattersall, "Exports and Economic Growth," p. 216; L.W. Copithorne, *A Neoclassical Perspective on Natural Resource Led Regional Economic Growth*, (Ottawa: Economic Council of Canada, 1977) Discussion Paper No. 92, pp. 18-20; Baldwin, "Patterns..," 278-9.

supply secondary manufactured products to the new region.¹⁰² If the rent is reinvested in the export sector it perpetuates the control of the foreign capitalists. Any initial investment tends to be repaid in a few years and after that further investment is made by a surplus generated in the new region but under foreign control. If the surplus is paid out to the foreign owners, the initial inflow of capital "sets up a perpetual outflow which inhibits the formation of capital within the surplus-producing country."¹⁰³

In the Latin American context it is assumed that very little of the rent-surplus, if any, is appropriated by local labour in the form of wages. In the Canadian case and particularly in British Columbia, the approach accommodates the flow of some of the rent to the labourers. This may be necessary, the argument goes, in countries with sparse aboriginal populations, to attract the necessary labour from other locations (even in countries with a large aboriginal population high wages may be required if skilled labour is required to extract the resources and this skilled labour must be imported).

However, even if some of the surplus flows to the local population in wages or profits and is accumulated to a level where investment is possible, local entrepreneurs must team up with foreign capitalists to secure the appropriate technology which will enable them to compete with foreign imports--hence a dependency still exists.¹⁰⁴ Marchak has pointed out that once the trading patterns are established by foreign capitalists the investment of local entrepreneurs will mimic the investment patterns of the foreign investors: if manufacturing in the centre and resource extraction in the new region are yielding a high rate of return local capital will flow to these profitable investments.¹⁰⁵

¹⁰² Marchak, *Green Gold*, 22.

¹⁰³ Watkins, "The Economic Development of Canada," in I. Wallerstein ed. *World Inequality*, (Toronto: Black Rose, 1975) 80.

¹⁰⁴ Veltmeyer, "A Central Issue..." 203; Frank, *Dependent Accumulation and Underdevelopment*, p. 117.

¹⁰⁵ Of course this has the same ring of inevitability about it as the orthodox "location theory" discussed

Phrased in the terminology of the export base theorists, the linkages of the export sector, that is the propensity to invest in secondary manufacturing will be very small. That some forwardly linked industries that semi-process raw materials might exist is explained by reference to a location theory which incorporates the fact that the central economy can in most cases manipulate transportation costs to its advantage.¹⁰⁶

Thus while Canadian dependency theorists have not examined the precise composition of the manufacturing sector in a dependent economy in the same detail as the export base theorists, it is clear that their prediction for the outcome of the metropolis-hinterland relationship in the secondary manufacturing sector is quite different. In contrast to the growing finished and unfinished producer goods sector predicted by Gilmour, Naylor predicts that the finished sector will remain small and most finished goods will be imported. Acheson and Veltmeyer expect the expansion of staple activity to accompany the active decline of unfinished and finished consumer goods sector as these industries (in the Canadian case) are:

either transferred to central Canada, closed out by (foreign controlled) parent corporations...or forced into bankruptcy by draconian freight rate policies.¹⁰⁷

One of the supposed strengths of the dependency approach is its break with the growth-determinism of the (neo-)classical models. However, in its place we are given a model which is equally determinist in that under-developed countries are expected to

above; Marchak, *Green Gold*, 22; Baldwin, "Patterns..." 279; Watkins, Mel H. "Resources and Underdevelopment," *Canada Ltd. The Political Economy of Dependency*, Robert Laxer, ed., (Toronto: McClelland and Stewart, 1973) p. 121.

¹⁰⁶ Where other local manufacturing does occur, the dependency theorists argue that it will likely take the form of branch plants of foreign firms whose control and profits will reside in the central economy. On the establishment of transportation costs by the central economy see T.W. Acheson "The Maritimes and 'Empire Canada'" *Canada and the Burden of Unity*, ed. David Jay Bercuson, (Toronto: Macmillan, 1977) 87-14; T.W. Acheson, "The National Policy and the Industrialization of the Maritimes, 1880-1910," *Acadiensis*, I, 2, (Spring 1972) pp. 2-28; T.D. Regehr, "Western Canada and the Burden of National Transportation Policies," *Canada and the Burden of Unity*, ed. David Jay Bercuson, (Toronto: Macmillan, 1977) 115-142; Bruce Archibald, "Atlantic Regional Underdevelopment and Socialism," *Essays on the Left*, ed. Laurier LaPierre *et al.*, (Toronto: McClelland and Stewart, 1971) 103-120; and Veltmeyer, "The Capitalist Underdevelopment of Atlantic Canada," "Capitalist Underdevelopment..."

¹⁰⁷ Naylor in Watkins, "Economic Development of Canada", 582-3; Veltmeyer, "The Capitalist Underdevelopment of Atlantic Canada," 23-4; and Acheson (quoted), 98-9; Frank uses the finished producer good sector as an index of maturity in: *Dependent Accumulation and Underdevelopment*, pp. 120, 131-3.

remain in their under-developed condition exacerbated over time until a revolution or some extra-ordinary interruption such as a war, breaks the dependent relationship.¹⁰⁸ For regional studies the primary flaws of dependency theory are both the determinism and that the dependency mechanism and its theoretical underpinnings dissolve, rainbow-like, when examined closely in a specific setting.

As with the export base approach, dependency models tend to be economistic in that the state, social classes, and politics receive little attention.¹⁰⁹ The focus of the dependency approach is on idealized links between and among nation states and their bourgeoisie and ignores concrete relationships not only among these groups but between other social divisions, including class, not strictly tied to the concept of polar relation with a centre. It is simply too simplistic. The proletariat are passive victims of the national and international bourgeoisie.¹¹⁰ Other criticism from both within and without the school and includes Lall's critique that dependence was neither a necessary nor sufficient condition to explain the situation in so-called "under-developed" regions.¹¹¹ In other words there are countries like Canada and Belgium that are heavily dependent on foreign centres but which are developed, and there are relatively insular countries that are not dependent but neither are they developed. Moreover some formerly under-developed countries like Mexico, South Korea, Taiwan, and Hong Kong have begun to industrialize along the economic model suggested as ideal; meanwhile former

¹⁰⁸ Benjamin Orlove, *Alpacas, Sheep and Men: The Wool Export Economy and Regional Society in Southern Peru* (New York, 1977) 12; Hirschman, "Generalized Linkage Approach, pp. 85-8.

¹⁰⁹ Norman Long and Bryan Roberts, *Miners, Peasants and Entrepreneurs Regional Development in the Highlands of Peru*, (Cambridge University Press: London, 1984) p. 7; Colin Leys, "Underdevelopment and Dependency: Critical Notes," *Journal of Contemporary Asia*, 7, 1 (1977); Patricia Marchak "Canadian Political Economy," *Canadian Review of Sociology and Anthropology*, 22, 5 (December 1985).

¹¹⁰ Orlove, *Alpacas, Sheep and Men*, 9; Sager, "Dependency, Underdevelopment, and the Economic History of the Maritime Provinces," pp. 117-137.

¹¹¹ S. Lall, "Is Dependence a Useful Concept in Analyzing Underdevelopment?" *World Development*, 3, 11, 1975. Alain Lipietz "New Tendencies in the International Division of Labor: Regimes of Accumulation and Modes of Regulation," in Scott and Storper ed. *Production, Work, Territory: The Geographical Anatomy of Industrial Capitalism* p. 16.

centres such as Britain and to a lesser degree the United States are declining.¹¹²

Perhaps most damaging to the dependency approach is the criticism that although the general relationships of the model are explained, the mechanism by which the dependent under-development occurs, is not. The distinction between financial and industrial capital, central to the mechanism of the "Merchants Against Industry" approach, evaporates under close scrutiny. Laxer argues that the phenomenon is a symptom, not a cause of dependency. Carroll *et al* have demonstrated that Canadian capitalists were not limited to financial investment but instead cooperated with foreign and other Canadian capitalists in both the financial and industrial spheres. The merchants studied by Richardson became industrialists whenever they had the chance. Craven and Traves argue that the distinction between the railways as tools of the merchants and industry collapses because the railways were a major industrial component of the industrial economy.¹¹³

The "Surplus Appropriation" approach has come under attack from a number of angles. Marxist critiques emphasize that the exploitive surplus extraction relationship between capital and labour cannot be directly transferred to a centre-metropole surplus transfer mechanism implied by dependency theory.¹¹⁴ Bickerton argues that there is nothing in this strand which distinguishes capitalist development and capitalist underdevelopment. Sager points out that the dependency approach requires that the centre's monopoly control of exchange relationships is assumed *a priori* and this renders a large part of the dependency analysis circular. Centralization of industry in

¹¹² Nor are these two processes unrelated. Scott & Storper, *Production, Work, Territory*: p. 9; Lipietz "New Tendencies in the International Division of Labor;" p. 16.

¹¹³ Laxer, "Political Economy of Canada", 334; William K. Carroll, John Fox and Michael D. Ornstein, "The Network of Directorship Links Among the Largest Canadian Firms" *Canadian Review of Sociology and Anthropology* 19, 1. (February 1982) William K. Carroll, "The Individual, class, and corporate power in Canada," *Canadian Journal of Sociology*, 9, 3, (Summer 1984); R.J. Richardson, "Merchants Against Industry: an empirical study of the Canadian debate," *Canadian Journal of Sociology*, 7, 3, (Summer 1982); Paul Craven and Tom Traves, "Canadian Railways as Manufacturers, 1850-1880," *Historical Papers*, Canadian Historical Association, 1983, pp. 226-253.

¹¹⁴ Veltmeyer, "The Capitalist Underdevelopment of Atlantic Canada."

central Canada is the definition of, not an explanation for, the relative de-industrialization of the regional economies.¹¹⁵ The assumption that the only capital available to a region must come from resource rents and will tend to be re-invested in resources implies that there was no capital market on which profit seeking entrepreneurs might draw. Another problem with this surplus transfer mechanism is that it assumes a weak and acquiescent local bourgeoisie and labour force but in the British Columbia case both labour and the local capitalist class took active roles in shaping the economy.

The dependency approach's problems in specifying the mechanism is not altogether surprising given that Marxist scholars claim the mechanism is not Marxist and the dependency theorists reject (neo-)classical economics. The dependency approach cannot claim to be grounded in either and has yet to develop its own theoretical foundations. The success of the critiques have prompted scholars in various disciplines to build on dependency theory to create frameworks that avoid some of its difficulties. These attempts are still preliminary and have yet to be refined by systematic critique. One of the most promising is the "production system" approach.

A Production System Framework

As they apply to manufacturing, the export base approach and the dependency approach share a desire to capture large scale processes; accommodate an interdisciplinary approach; and point to important factors which are influential in the process of economic change. Both start with the same premises of a staple based economy but yield a series of contradictory and dichotomous predictions about changes in the structure of secondary manufacturing in a staple economy over time. The former suggests a progression through a clearly defined chronology which, in general predicts the decline

¹¹⁵ James Bickerton, "Underdevelopment and Social Movements In Atlantic Canada: A Critique," *Studies in Political Economy*, 9, (Fall 1982); Sager, "Dependency, Underdevelopment, and the Economic History of the

in the relative importance of primary extraction and primary manufacturing. The latter predicts that the importance of the primary sector and primary manufacturing will increase or at least not decline substantially over time. The export base approach predicts a relative shift away from the early consumer food and drink industries towards the finished and unfinished producer goods and consumer durables and semi-durables. In contrast the dependency approach argues that the initial consumer oriented necessity industries like food and drink will continue to occupy most of the secondary manufacturing industries and that there will be no significant shift toward finished producer goods. In terms of the export base stage approach outlined above, the dependency theorists predict that the economy of the new region will not move much beyond the most primitive stage.

The export base approach tends to emphasize demand characteristics and market prices of factor inputs and has been most useful in abstract modelling and aggregate analysis at, for example, the national level.¹¹⁶ The dependency approach is less cohesive but has tended to emphasize either exchange relationships or supply side considerations such as the structure of the factor markets¹¹⁷ or how the factor input prices are set but much of it looks exclusively to factors outside the region for the Maritime Provinces."

¹¹⁶ See for examples: Morris Altman, "Economic Development with High Wages: An Historical Perspective," *Explorations in Economic History*, 25, 2, 1988 pp. 198-224 and Morris Altman, "Resource Endowments and Location Theory in Economic History: A Case Study of Quebec and Ontario at the turn of the Twentieth Century," *Journal of Economic History*, VXLV, 7, (Dec. 1986) pp. 999-1009; Chambers & Gordon, "Primary Products and Economic Growth," Inwood, "Economic Growth and Structural Change;" K. Inwood and J. Chamard, "Regional Industrial Growth during the 1890's: The Case of the Missing Artisans," *Acadiensis*, XVI, 1, (Autumn 1986) pp. 101-17; There has however been a call in the literature for a more thorough examination of the supply side see: McCalla & George, "Measurement, Myth and Reality," p. 74; George, *Leader and a Laggard*; and Tattersall "Exports and Economic Growth," draw attention to the supply of entrepreneurial talent as being crucial.

¹¹⁷ There is a difficulty in finding a common terminology that allows this kind of explicit comparison and I am aware that for comparative purposes I am shoe-horning some of the dependency concepts into orthodox "jargon". The dependency concepts still manage to give good value despite this uncomfortable fit. For an example of a Marxist, approach focussing on factor markets, based on pre-existing class formations and social structures see Phil Wood, "Marxism and the Maritimes: On the Determinants of Regional Capitalist Development," a paper delivered to the Atlantic Studies Conference, Edinburgh, 1988) p. 25; James Frost, "The Nationalization of the Bank of Nova Scotia, 1880-1910," *Acadiensis*, XII, 1, (Autumn 1982); and Acheson ("National Policy" and "Empire Canada") focuses on the capital markets. Forbes on the structure of the transport markets; E.R. Forbes, "Misguided Symmetry: The Destruction of Regional Transportation Policy for the Maritimes," in David J. Bercuson, ed., *Canada and the Burden of Unity*, (Toronto: Macmillan, 1977), 60-86;

explanation.¹¹⁸

In terms of weaknesses, both approaches are deterministic in predicting an inevitable pattern of economic development. An alternative framework should reject the "growth determinism", set aside the idealized "normal growth path" for an economy and examine each case, recognising its unique social, historical and production dimensions. The state should be viewed both as a product of and a participant in social conflict.¹¹⁹ Certainly we will find regularities in patterns between economies/regions but equally certainly we will find many examples that do not "fit the pattern".

One of the characteristics that both approaches share is that they have, essentially, been arrived at deductively. In other words, they are explanations derived from presumed *laws* of capitalism rather than from case studies.¹²⁰ This feature alone has resulted in a problem for regional studies. First, the *laws* on which they are based are "economic" narrowly defined, and therefore are blind to many of the conflicts and alliances: class, gender, ethnicity, nationalism, regionalism, religion, that comprise a society.¹²¹ They both see the world in only one dimension, utilizing a limiting typology which at the crudest level accommodates only two types of regions; as a result they overlook much of the conflict that occurs within and among regions. They consider, for example, the political arena as simply an adjunct to a larger more fundamental process.¹²² As a result the loosely defined fields of regional studies and even international development studies, have splintered what often prove to be crucial variables, into specialty studies. It is, however, at the level of regional and micro-studies that these

¹¹⁸ See for example Clow, who focusses on the political influence on factor pricing; North makes the point that this avenue of analysis is important yet overlooked by the orthodox economists; Clow, "The Maritime Challenge;" Douglas North, "Conference Summary," pp. 232-4.

¹¹⁹ Malcomson, "Politics and the State in the Nineteenth Century," p. 12.

¹²⁰ Inwood & Chamard, "Missing Artisans," p. 109; and Allen, G. Green, *Regional Aspects of Canada's Economic Growth*, (Toronto: University of Toronto, 1971) p. 68 both argue that case studies are needed; Orlove, *Alpacas, Wool and Men*, makes this the rationale for his post-dependency "sectoral model".

¹²¹ Orlove, *Alpacas, Wool and Men*; Fogarty, "Limits of the Staple Theory," p. 189.

¹²² Marchak "Canadian Political Economy;" Scott and Storper, *Production, Work, Territory*; Clow, "Maritime Development."

relationships are visible as they establish the limits within which the "economic" laws must operate. The two main approaches turn a blind eye even to "economic" relationships that do not fit their basic assumptions: oligopoly, monopoly and monopsony do not fit the export base model as competition escapes the dependency model. Finally, because of the large ideological component of the two competing approaches the scholarly community itself is also split into factions which generally ignore each other. Comparisons between the two theories, where this occurs, tends to be done within one paradigm to the disadvantage of the other and hence there is a difficulty in finding a platform or even a common terminology to compare the two.

There is, in fact, some "coming together" in the traditions. North, from the orthodox export base tradition and Marchak from a neo-Marxist approach, have stressed the necessity to understand political, social, and cultural patterns in order to understand how the economy changes.¹²³ Hirschman considers his "generalized linkage approach" to be compatible with "micro-Marxism." Copithorne and Melvin have come to conclusions using neo-classical economics and varying assumptions which explain the effect of tariffs and foreign ownership in terms that are similar to the conclusions of the dependency approach. Copithorne in particular argues that it is not the character of the staple but "whether resources are allowed to cause economic growth," by government, capital and labour that is important. The convergence suggests the possibility of a more fundamental theoretical model underlying the two approaches.¹²³

The two approaches do however, converge in that they both accept a similar "production function" and out of it sets of production relationships can be compared. Both the dependency and the export base approaches also converge on the level of the cost function. A composite cost function, a list of all the costs that go into production (and

¹²³ Douglas North, "Conference Summary," pp. 232-4; Marchak, "Canadian Political Economy,"; Hirschman, "Generalized Linkage Approach," pp. 88-91; Copithorne, *A Neoclassical Perspective on Natural Resource-Led Regional Economic Growth*; pp. 18-20; James R. Melvin, "The Regional Economic Consequences of Tariffs

in this case distribution) of the total cost of output within either the export base or dependency approach would look like:¹²⁴

$$\text{Total Cost} = \text{Costs of (Labour, Capital, Material Resources Used, Transportation, Entrepreneurial Talent, Tariffs)}$$

Beyond this point the two analytical traditions cleave apart. The orthodox economic school treats the costs of Labour, Capital, Resources, Transportation, Tariffs and Talent as independent variables and focusses not on the markets themselves as much as on the reaction of firms to market prices. The dependency school considers the costs of the factors of production to be dependent variables which are determined by the exchange relations of capitalism.

Rather than using either market relations or exchange relations as the focus of analysis this paper utilizes production relations as a means of capturing both these sets of relationships. The system of production relationships, (production system) at its most basic level is the conjuncture of material resources and human activity.¹²⁵ The type of conjuncture, though, depends on the nature of the material being worked, the existing levels of technology, and a complex set of social and cultural structures which taken together comprise the complete set of production relations. The emphasis on production relations is loosely adapted from what Sager calls "post-dependency" scholarship.¹²⁶ It is used here as a heuristic device rather than an alternative framework.¹²⁷

and Domestic Transportation Costs," *Canadian Journal of Economics*, XVIII, 2, (May 1985) pp. 237-257.

¹²⁴ This cost function is explicitly drawn in Chambers & Gordon, "Primary Products and Economic Growth," pp. 201-220; Pomfret, "The Staple Approach;" Watkins, "A Staple Approach," p. 54.

¹²⁵

Resources are elements that can be used or exchanged to attain desired ends. Several basic types of activity are included. In production activities, resources are transformed into new objects. In distribution activities resources are exchanged and transported....In administrative and bureaucratic activities, resources are allocated to direct and constrain other activities. The principal activities, then, are economic and political in nature.

Orlove, *Alpacas, Sheep and Men*, p. 14.

¹²⁶ Sager, "Dependency, Underdevelopment, and the Economic History of the Maritime Provinces:" the "post dependency approach to which Sager refers is sketched out in: Long and Roberts, *Miners, Peasants and Entrepreneurs*, pp. 1-43.

¹²⁷ My use of the term "production system" owes a debt to, but is not interchangeable with, similar terminology used in the anthropological studies of pre-capitalist economic systems in, for examples: C. Meillassoux, "From reproduction to production: a Marxist approach to economic anthropology," *Economy and Society*, 1, 1 (1972): 93-105; Robert Hecht, "The Transformation of Lineage Production in Southern Ivory Coast,

Although there is a debt in my adoption of the production systems approach to the "staple" approach of Innis it is different in a one key aspect. While the Innis and other staple theorists considered the set of production relationships (production and cost functions) of a staple product to be the result of characteristics inherent in the staple itself (furs or wheat for example have different production functions and hence as staple products will produce different societies), this approach focusses on the interaction between the technological requirements of the staple production (which is determined in part by the characteristics of the staple) with the existing social system. Production functions are both technologically and socially circumscribed and do not exist independently of the humans who are incorporated within them. Any staple product, wheat, for example, can be produced using different methods of production on farms of different sizes using different types of labour (family, seasonal wage labour, slaves) depending on the existing social system. Hence, wheat as a staple had a different production function in the Canadian west than it had in Argentina, and hence had a different impact on the two societies in which production took place.¹²⁸

A "system of production" approach argues that the production function of any product will be any one of a number of technologically determined possibilities which suit the socio-political context in which production evolves. Prevailing legal and political institutions permit certain types of labour organization and exploitation and prohibit others, determine property rights and control markets. Aspects of social organization, for example, religion, family structure, and ethnic mix are all elements in the determination of the labour process and hence the production function.¹²⁹

1920-1980," *Ethnology*, 23, 4 (1984): 261-278.

¹²⁸ Fogarty, "Limits of the Staple Theory," pp. 187-9, 191; See also Watkins "New England's success...shows us that the characteristic of cod as a staple can hardly explain the slow growth of Nova Scotia and Newfoundland" in "Staple Approach," p. 67.

¹²⁹ Long & Roberts, *Miners, Peasants and Entrepreneurs*. p. 8.

Of course the relationship between the society and the production systems of the economic activities within in it, is reciprocal. The social system itself is an expression of earlier production relationships embedded as culture. Once embedded these socio-cultural relationships determine future possibilities. Changes in the relations of production will inevitably create pressure for a change in the social system. The approach is materialist in that relations of production create social structures. Once established the social structures channel new production relationships. Within the production system approach the social system itself becomes a target of investigation as the context within which specific production functions, market or exchange relationships are articulated.

It is distinct from the neo-classical export base model's production function which is an expression of a static relationship, and the analysis pursued within a given institutional framework. The production system approach examines production as a process, an evolution of relationships and institutional structures. If we can compare the neo-classical production function to a "snapshot" taken at a given moment in time and therefore without an historical context, the production function, as it is used in production system approach, may be compared to a "video" which examines its own historical context, but from which "stills" can be abstracted when this is useful for the analysis. To an individual capitalist/labourer/rentier, at a specific moment in time, market structures and the costs of the factors of production and transportation are fixed and therefore are independent variables in the analysis of a particular decision; an analysis of the behaviour of individual firms at given times requires the "snapshot" or "still" approach.. The cumulation of all of these individuals' decisions, of course is the decision of the whole sector but it is not the decision of one agent multiplied by the number of agents. Over time relative factor prices do change, as do market arrangements, opportunity costs, utility functions, and the social and political institutions that direct markets, so that individuals acting at different times are responding to

different conditions.¹³⁰ Therefore, in a long run analysis the components of the production function must be treated as dependent variables and explanations sought for the changing organization of factor markets and changing factor prices. Seen as the description of a process the production system both examines how the social system defines the initial possibilities of production and then is in turn shaped by the pressures that the production process creates. Within it, each of the organizational subsystems that establish the prices for each of the factors of production also become objects of analysis.

The production system approach is distinct from the neo-Marxist dependency approach in that there is no *a priori* assumption that the elements that shape the production system will be found outside the region. Rather, it assumes that the main elements in the production system will have to be located empirically within a broad range of categories. Production relationships are ultimately rooted in the conditions within the region and determine how a region will respond to external forces. Hence the likelihood that no two regions or a single region at different times will respond in exactly the same way to identical stimuli. Unlike the dependency approach it assumes that there will always be an interactive dynamic relationship between sectors and classes within and without the region under study. It is distinct from the dependency approaches in that it rejects their determinism and allows progression/regression/stasis on the path which *they* have laid out as the ideal.

In the following chapters, and in particular Chapter 7, the production systems approach is used and contrasted with the export base and dependency approaches as tools to understand the secondary manufacturing sector in British Columbia. To do so requires the description of the specific time and place, and one of the key components of the historical context is the resource, or staple sector.

¹³⁰ "Today's locational decisions are made in an environment shaped by all the marginal decisions of the past and the existing framework may be quite different from that which would emerge if the same decisions

Chapter Three

The Resource Sector: Extracting Staples, 1860-1915

So long as the gold stream continued to flow in undiminished volume, everything that gold alone could buy was to be obtained in the Cariboo.

*George Mercer Grant**

In the 55 years before 1915 British Columbia saw the extraction of five different natural products or "staples" in an overlapping series. While Harold Innis claimed, "the shift to new staples invariably produced periods of crises in which adjustments in the demand structure were painfully made and a new pattern created in relation to a new staple,"¹³¹ the shifts from one staple to another in British Columbia seem to have been accomplished without significant crises.¹³²

British Columbia, over the study period, shifted constantly from staple to staple. For the pre-contact economy there is no doubt that dried salmon was the staple product. With the introduced demand for furs, much of the native economy switched its focus to the gathering of sea otter fur, and later as that population dwindled, to those of terrestrial fur bearers. Fur remained the focus of the economy until the gold rush of 1858. The enduring importance of the fur trade is that over the period between the establishment of the colony of Vancouver Island in 1849, and the gold boom of 1858, the Hudson's Bay Company exported every staple that would be exported from British Columbia.¹³³ Beyond this the production system of the fur trade required a certain

were made today," Stabler, "Exports and Evolution..," p. 22

* Presented as part of a paper to the Royal Colonial Institute, March 14 1893; reprinted in British Columbia, *Crown Land Surveys*, 1895 p. 747.

¹³¹ Harold Adams Innis, "Transportation as a Factor In Canadian Economic History," *Essays in Canadian Economic History*, ed. M.Q. Innis (Toronto: University of Toronto, 1956), 56.

¹³² Pfister makes this point with reference to the Pacific Northwest in: "External Trade and Regional Growth."

¹³³ With the exception of hydro-electricity and pulp and paper which were not exported until well after 1900; Richard Mackie, "Colonial Land, Indian Labour and Company Capital: The Economy of Vancouver Island, 1849-1858," M.A. Thesis, University of Victoria, 1984.

spatial and distribution pattern and this set the spatial patterns for British Columbia until 1885.

Gold, which was to succeed fur as the most important staple product, was discovered in the Queen Charlotte Islands in 1850 and small quantities were exported from British Columbia over the years 1851 to 1853.¹³⁴ Coal which was to succeed gold as the main export of the province, was first exported in 1852 when 1,840 tons were shipped from mines at Nanaimo to San Francisco.¹³⁵ Salmon, the staple industry that was to rival mining in the 1880's, was salted and exported in barrels to Hawaii and England as early as the 1820's.¹³⁶ Lumber, which was to become the most valuable export product for the province after 1900, was first milled on Vancouver Island in 1849 and a number of deals shipped to San Francisco where they fetched \$80 per thousand feet in gold dust. Previously the company sawmill at Fort Vancouver had exported at least one cargo to Hawaii in 1829.¹³⁷

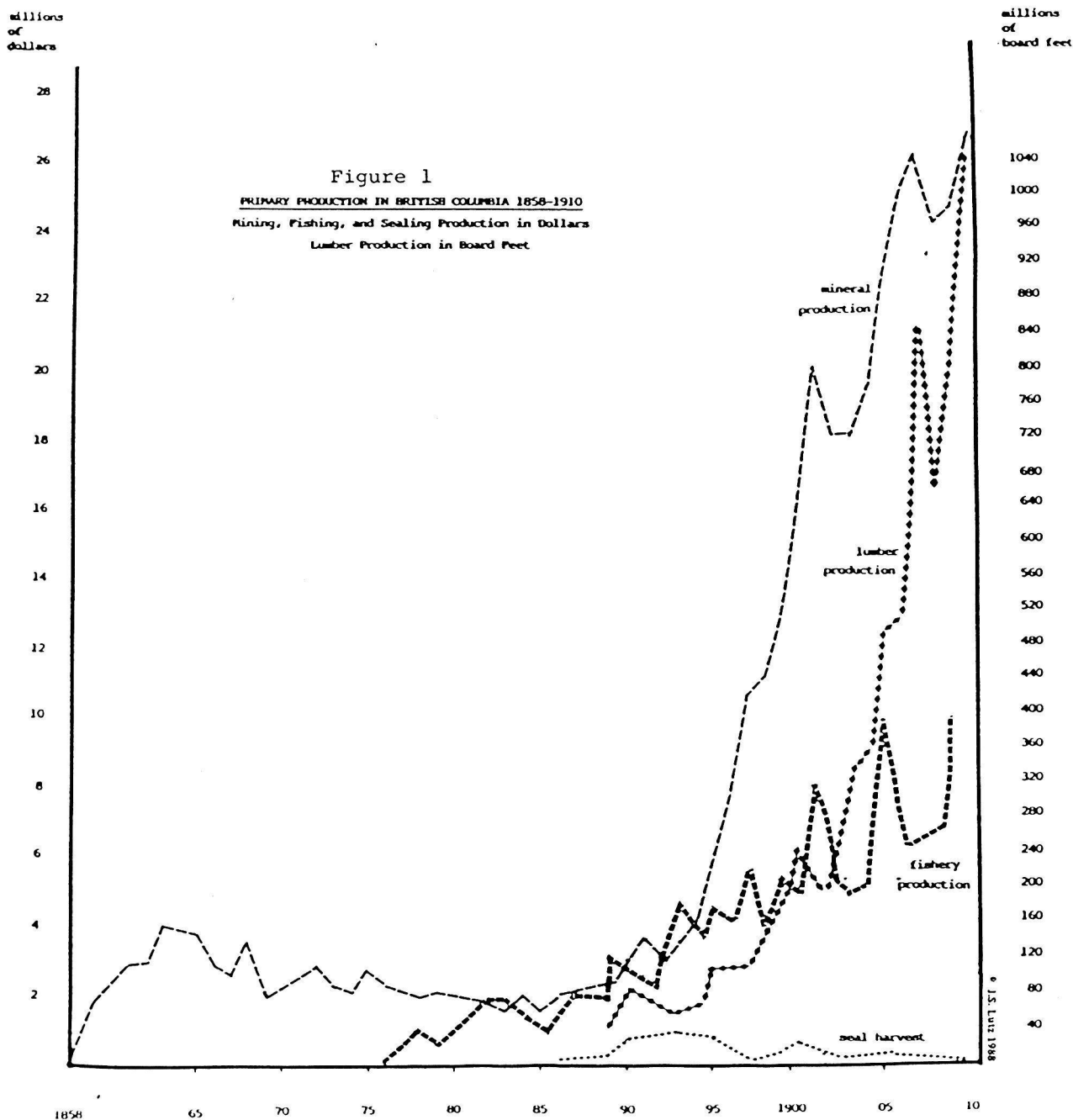
The transformation from a fur economy to one based on gold was accomplished without major "disruptions," although not without growing pains. After 1858 until the early 1880's gold overshadowed all other exports. Because it is found in a pure state placer gold requires no processing and spawned no primary manufacturing industries. Instead, the manufacturing that existed was secondary manufacturing and serviced the consumer demands of the miners and urban dwellers. Beside these "final demand linkages" there was also the basic requirements of miners for tools, tents, etc... and these "backward linkages" started a small producer goods sector.

¹³⁴ Howay et al, *British Columbia and the United States*. 139.

¹³⁵ *ibid.*, 179.

¹³⁶ Mary K. Cullen, *History of Fort Langely*. (Ottawa: National Historic Sites and Monuments, 1977); Margaret A. Ormsby, *British Columbia: A History*. (Vancouver: Macmillan, 1971) p. 73, note 36.

¹³⁷ Mackie, "Colonial Land, Indian Labour and Company Capital," pp. 141-150; W. Kaye Lamb, "Early Lumbering on Vancouver Island, Part 1, 1844-1855," *British Columbia Historical Quarterly*. II, (January 1938), p. 39.



Sources for Figure 1: Lumber figures exclude wood cut from the Dominion or Esquimalt and Nanaimo Railway Lands. A system of charging royalties on timber cut was first introduced in B.C. in 1888 and prior to that there are few reliable estimates of the timber harvest. Totals for years 1889 to 1903 from "Timber Inspector's Report" or "Forestry Inspector's Report" in *Report of the Chief Commissioner of Lands and Works, B.C. Sessional Papers 1890-1904*; From 1903 to 1910 figures are obtained from R.E. Gosnell, *The Yearbook of British Columbia and Manual of Provincial Information 1911, 1914* Victoria, 1914, p. 250; Fishing figures from: R.E. Gosnell, *The Yearbook of British Columbia and Manual of Provincial Information 1911, 1914* Victoria: 1914, p. 224; Figures for mining from *Annual Report of the Minister of Mines, B.C. Sessional Papers, 1916*, p. K-14. Figures for sealing are from Canada, Department of Marine and Fisheries "Annual Reports" compiled in D.G. Patterson and J. Wilen, "Depletion and Diplomacy: The North Pacific Seal Hunt, 1886-1910" *Research in Economic History*, Vol. 2, pp. 81-139.

Placer gold is unique among export products in that it is always in high demand; it always provokes an immediate increase in the level of economic activity in the region in which it is found, and it can be extracted by almost anyone with little or no skills or capital. Because it has a high value by weight it is easy to transport. When it is found in areas remote from settlement it creates a problem which is the reverse of most staple products: the problem of moving commodities to the mining area.

The period 1858 to 1863 marked the ascendancy of the placer gold mining in the colony of British Columbia and it witnessed a growth pattern atypical to British Columbia's other extractive industries. Unlike the centralized fur industry, gold was usually discovered by a group of individuals who were working on their own behalf. With news of the discovery other miners would gather in the vicinity and stake adjacent claims. Hard on the heels of the miners came the hoteliers, saloon keepers, prostitutes, merchants, and a host of other service industries including government gold commissioners and constables. The first manufacturing concerns usually included a sawmill, gristmill, blacksmithy, tinsmithy, bakery and often a brewery and printer.¹³⁸ Coincidentally, or nearly so, would be the provision of a form of transportation to the closest distribution center. Initially communication was likely to be established by human packers, then as a mule trail and waggon road developed, so would pack trains and stagecoaches. Finally, steamboats and later, railways, provided access to remote resource extraction sites. As a result the placer mining frontier was an urban frontier and shared little of the centralized control that characterized the fur trade.¹³⁹ The demand of the transportation sector for waggons, ships, steam engines and later rolling stock was eventually one of the most important linkages to the manufacturing sector.

¹³⁸ See Chapter 4.

¹³⁹ For good studies of the evolution of mining camps see Cole Harris, "Industry and the Good Life around Idaho Peak," *Canadian Historical Review*, LXVII, 3 (September 1985) pp. 315-342; Ralph Mann, *After the Gold Rush: Society in Grass Valley and Nevada City California, 1849-1870*, (Stanford: Stanford University Press, 1982). Duanne Smith, *Rocky Mountain Mining Camps: The Urban Frontier*, (Bloomington, University of Indiana, 1967).

After gold the region witnessed a succession of export booms, most of which overlapped each other. Even in the midst of the gold rush local entrepreneurs were already looking beyond gold to the export of other commodities. Constantly exploring new investment opportunities, regional entrepreneurs developed new industries ready to take the place of those on the decline.¹⁴⁰ From gold the focus of the export sector shifted to coal, to tinned salmon, to seals, and finally, to wood products (see Figure 1).

One of the more dynamic of the local entrepreneurs was Captain Edward Stamp. Stamp had visited Vancouver Island in 1857, as employee of Anderson and Company, one of Britain's largest timber firms. With the outbreak of the American Civil War in 1860, Anderson and Company sought an alternative to their lumber supply in the American Southwest and settled on the Alberni Inlet, on Vancouver Island for the site of a sawmill to supply the company's customers in the Pacific and made Stamp the manager.¹⁴¹ The mill was constructed between 1860 and 1861 and by 1862 had shipped over a million feet of lumber worth \$91,000 and spars worth \$28,673.¹⁴² Its major market was Shanghai followed by Australia, Chile, and Hawaii.¹⁴³ Despite lower log prices and labour costs than the American mills the Port Alberni mill was virtually excluded from the San Francisco market by 30 percent ad valorem duty imposed on imports.¹⁴⁴ At the height of its production the mill employed over 700 people. Despite the fact that timber exports were small in comparison to gold, the mill was the largest single investment in the colony and the largest single employer. The close of

¹⁴⁰ For pre-1858 entrepreneurial activity see: Mackie, "Colonial Land, Indian Labour and Company Capital," pp. 203-226.

¹⁴¹ Joseph Collins Lawrence, "Markets and Capital, A History of the Lumber Industry in British Columbia, 1778-1952," Unpublished M.A. Thesis, University of British Columbia, 1951, 21.

¹⁴² A.C. Anderson, *Dominion of the West*, (Victoria: Richard Wolfendon, 1872), Appendix B.

¹⁴³ Thomas R. Cox, *Mills and Markets, A History of the Pacific Coast Lumber Industry to 1900*, (Seattle: University of Washington Press, 1974), 134.

¹⁴⁴ Howay et al, *British Columbia and the United States*, 302; Cox says the duty was \$1 per 1,000 feet; Cox, *Mills and Markets*, 268; see also p. 133; Mackie notes the disappointment of Douglas when Vancouver Island was excluded from the reciprocity treaty of 1854; Mackie, "Colonial Land, Indian Labour and Company Capital," p. 291.

the American Civil War in 1865 brought southern mills back into competition in the Pacific. This, along with the collapse of the Shanghai market and the general recession in the lumber industry coupled with difficulties in moving logs to the mill, forced it to close in 1866.¹⁴⁵

Meanwhile, some local entrepreneurs, using profits made in the Cariboo mines established a sawmill at New Westminster in 1862. That same year Captain Stamp who had suggested the site of the Alberni Mill, attracted \$100,000 from the London firms James Thompson and Company and Thomas Bilbe and Company to build a sawmill on Burrard Inlet. During the first five weeks of production this company cut around 700,000 feet of lumber for the Australian market. Subsequently the firm sold its products to Hawaii, Shanghai, Java, London, and New Zealand but exported very little to San Francisco.¹⁴⁶

Soon after Stamp's venture got its start, the local entrepreneurs who had started the New Westminster mill relocated on the north side of Burrard Inlet. The firm made up of Sewell Moody, future Lieutenant Governor Hugh Nelson, and William Dietz, had attracted \$100,000 in capital from Andrew Welch, the San Francisco agent of the Victoria - San Francisco firm Welch Rithet and Company. The mill, which became known as the Moodyville Mill rivaled Stamp's Hastings Mill in a successful run at the export market that lasted until the turn of the century.¹⁴⁷ The steady growth of the lumber industry is illustrated by the fact that in 1866 there were 12 sawmills in British Columbia (including Vancouver Island), with a total capacity of 329,000 feet of lumber per day.¹⁴⁸ In 1895 there were 51 sawmills with a daily capacity of 3,000,000

¹⁴⁵ This example illustrates how the technology of the day defines what is a "resource". Subsequent to this mill's closure a sawmill and British Columbia's largest integrated pulp and paper complex were built on the same site and continue to operate today.

¹⁴⁶ Lawrence, "Markets and Capital," 24-25.

¹⁴⁷ *ibid.*, 25 & ff.

¹⁴⁸ F.C. Langley, *Pacific Coast Directory, 1867*, San Francisco, 1867, p. 158.

feet¹⁴⁹ and by 1909 215 lumber mills with a daily capacity of 4,500,000 feet and 59 shingle mills with a capacity of 3,385,000 shingles.¹⁵⁰

The logging and sawmilling industries had backward and forward linkages to the manufacturing sector. Since the establishment of the first mills on Burrard Inlet in the 1860's sawmills had been using steam to run the saws and by the turn of the century steam power was used extensively in the woods to move logs.¹⁵¹ This demand for capital goods created a large market for engines and boilers¹⁵² and mill machinery as well as the simpler mechanical tools used by the loggers. Besides these backward linkages the sawmilling industry was forwardly linked to local furniture and particularly box manufacturers who crated fruit and fish.

Meanwhile over the decade of the 60's other entrepreneurs were exploring other export industries. In 1866 Hugh McKay in the schooner *Ino* out of Victoria, made the first attempt at open sea (pelagic) sealing.¹⁵³ By 1867 James Symes, a resident of New Westminster, was experimenting with the canning of salmon,¹⁵⁴ and before the close of the decade, three British Columbia firms had entered the whaling trade, a trade initiated by the Hudson's Bay Company in 1843.¹⁵⁵

Through the same period another local entrepreneur was laying the foundations for the "up and coming" coal industry. Robert Dunsmuir had come to Vancouver Island as a coal miner for the Hudson's Bay Company in 1851, but in 1855 he left the

¹⁴⁹ "Forest Wealth of Canada," Canada, Sessional Papers, 1895, p. 135.

¹⁵⁰ B.C. Sessional Papers, 1911, "Final Report of the Royal Commission of Inquiry on Timber and Forestry 1909-1910," p. D28.

¹⁵¹ For a study of one of the backward linkages see: R. Griffen, "Shingle Sawing Machinery in B.C. 1901-1925," *Material History Bulletin*, 81, 13, pp. 21-38.

¹⁵² See Chapter 7.

¹⁵³ Howay et al, *British Columbia and the United States*, 320.

¹⁵⁴ Duncan A. Stacey, *Sockeye and Tinsplate: Technological Change in the Fraser River Canning Industry, 1871-1912*, (Victoria, Provincial Museum, 1982), 2.

¹⁵⁵ Three companies produced whale oil worth \$12,000 with a capital investment of \$20,000 and a labour force of 49 in 1870; see Innis and Lower, *Select Documents*, 797; Mackie, "Colonial Land, Indian Labour and Company Capital," pp. 30-6.

company's employ to prospect on his own. In 1869 he discovered the rich Wellington Seam, and in 1871 formed a partnership with three officers of the Royal Navy stationed in Victoria to develop it.¹⁵⁶ The mine catapulted Dunsmuir into the role of coal magnate and started an empire that stretched down the coast into California. In the 18 years following 1881 Vancouver Island coal was the British Columbia's leading export.

The highest quality coal on the Pacific coast was located at Nanaimo,¹⁵⁷ and found a ready market in San Francisco despite the handicap of a \$0.75 per ton tariff imposed on the Canadian coal. The coal was primarily shipped to San Francisco which was dependent on Vancouver Island as its single largest source of coal. In 1882, 157,762 tons of coal were shipped to San Francisco from Nanaimo; this comprised about 18 percent of the coal received at the port of San Francisco. Nine years later Vancouver Island supplied 40 percent of San Francisco's coal imports.¹⁵⁸ From production of under \$100,000 in 1860 coal production climbed to over \$800,000 in 1880, \$3 million in 1890-1, \$4.3 million in 1900 to \$9.8 million in 1910.(See Figure 1). As with sawmilling, coal mining required steam technology to drive pumps, lifts and to haul ore and thus had its linkages to the secondary manufacturing sector.

British Columbia's next major export industry was the salmon canning industry, and again the industry was started by local entrepreneurs, and in this case, they used primarily local capital. Salmon have always lived in the waters British Columbia but preservation technology limited the extent of the market. Salmon had been integral to the economy of the native Indians who dried and smoked it and traded it throughout

¹⁵⁶ Lieutenants Wadham, Diggle, and Nelson all of the H.M.S. Grappler.

¹⁵⁷ In 1882 Dr George Dawson of the Canadian Geographical Survey, in evidence given to a committee of the federal parliament, cited a United States government survey: to produce a given head of steam required 1,800 lb.s of Nanaimo coal; 2,400 lb.s of Seattle coal; 2,600 lb.s from Coos Bay, Oregon; and 2,600 lb.s of Mount Diablo, California coal. See Canada, *Province of British Columbia, Information for Intending Settlers*. (Ottawa: Department of Agriculture, 1883), 3.

¹⁵⁸ British Columbia, Report of the Minister of Mines, 1890, *British Columbia, Sessional Papers, 1891* pp. 1201-1202.

the region. Whites had been exporting salted salmon from British Columbia since the establishment of Fort Langley on the Fraser in 1826 as far away as Hawaii. Attempts at shipping salted salmon to England proved unsuccessful due to spoilage on the four or five month ocean voyage.¹⁵⁹

By 1870 the problem of preserving salmon for long voyages had been solved by the importation of canning technology from Great Britain. In that year the ubiquitous Captain Stamp, recently returned from a fourteen month stay in Britain, started a small cannery, using his own capital, at New Westminster. Later that same year he was joined by a group of locals under the direction of the New Brunswicker Alexander Loggie and an Aberdonian, Alexander Ewan, who located three miles down-river from Stamp.¹⁶⁰ After Stamp's death in 1871 his firm was taken over by his can manufacturer¹⁶¹ John Sullivan Deas and the firm of Victoria merchants Findlay, Durham and Brodie.¹⁶² Two years later another local firm, and a firm using British capital but directed by the local entrepreneur, (and at that time British Columbia's agent general in London,) Gilbert Malcolm Sproat, also established canneries on the Fraser. Fish canning became increasingly automated over the period and required steam power and sophisticated machinery as well as such items as tin cans, coloured labels, shipping boxes which were supplied by local manufacturers.¹⁶³

Victoria merchants and commission agents continued to flock to the new industry so that by 1881 there were 14 canneries in the province, and by 1883, 21 canneries: 13

¹⁵⁹ Mackie, "Colonial Land, Indian Labour and Company Capital," pp. 26-41.

¹⁶⁰ James Morton, *The Enterprising Mr. Moody and the Bumptious Captain Stamp*, (Vancouver: J.J. Douglas, 1977), 96-99.

¹⁶¹ At that time the cans were hand manufactured. The tin sides were measured on a sheet of tin, hand-cut, shaped around a wooden cylinder, and soldered to the circular ends which were also hand cut.

¹⁶² Keith Ralston, "John Sullivan Deas: A Black Entrepreneur in British Columbia Salmon Industry," *BC Studies*, No. 32, (Winter 1976-77), p. 69.

¹⁶³ Stacy, *Sockeye and Tinplate*: P. W. O'Bannon, "Technological Change in the Pacific Coast Salmon Industry 1900-1925: A Case Study," *Agricultural History*, 82, 561, pp. 151-171; Albion Iron Works of Victoria invented several of the machines used in the British Columbia salmon canneries. See Chapter 7.

operating on the Fraser, 5 on the Skeena, 2 on the Nass Rivers, and 1 on Rivers Inlet.¹⁶⁴ Up until the late 1880's it was "characterized by small firms, low levels of industrial concentration and a high incidence of local proprietorship and financing."¹⁶⁵

The other regional export industry which developed through the study period was the sealing industry. In 1880 three sealing vessels garnered 12,083 pelts and this was apparently enough to attract wider interest. A decade later there were 29 vessels sailing from Victoria and in 1890 their take was 39,653 pelts. The Victoria fleet's peak catch was 50,091 pelts in 1891. For the remainder of the decade the catch hovered between 26,000 to 41,000 pelts. Due to overhunting and harassment by the United States government the catch plummeted after 1900 until 1909, the last year of fishery, when only 3,119 pelts were taken.¹⁶⁶ Until the close of the fishery the fleet wintered in the city, provisioned there each spring, and returned in the fall to sell its catch. Victoria performed most of the functions of a metropole for the pelagic sealing industry which was comprised of both Canadian and American vessels. Outfitting the fleet provided a steady income for Victoria foundries, sail makers, ship chandlers and bakers¹⁶⁷ and the sealers wages were a main source of income for the hotels, rooming houses, saloons, eating houses, and the general retail trade.¹⁶⁸

Of all the export booms in British Columbia in the study period, only the last one, the mining boom of the Kootenay-Boundary country involved a majority of foreign capital and foreign entrepreneurship. Difficult access to the mines from British

¹⁶⁴ Innis and Lower, *Select Documents*, 796.

¹⁶⁵ David J. Reid, "Company Mergers in the Fraser River Salmon Canning Industry, 1885-1902," *Canadian Historical Review*, LVI, (1975), p. 282.

¹⁶⁶ All the figures for sealing are from Canada, Department of Marine and Fisheries "Annual Reports" compiled in D.G. Patterson and J. Wilen, "Depletion and Diplomacy: The North Pacific Seal Hunt, 1886-1910" *Research in Economic History*, Vol. 2, pp. 81-139; see also: Peter Murray, *The Vagabond Fleet: A History of West Coast Sealing*, (Victoria: Sono Nis, 1988).

¹⁶⁷ E.B. Marvin and Co., ship chandlers and sail makers also operated some sealing ships. McQuade and Sons, another ship chandler also furnished cannery supplies. M.R. Smith and Co, bakers, produced the pilot biscuit that the sealers used as staples; see *Victoria Illustrated*, 87.

¹⁶⁸ Harry Gregson, *A History of Victoria 1842-1970*, (Vancouver: J.J. Douglas, 1970) 154.

Columbia, as compared to the United States, gave American entrepreneurs an advantage over their Canadian counterparts. Lode metal mines were developed in the Kootenays in the 1890's and before the end of the decade they were out-producing the coal mines. Total mineral production rose from just over \$2 million in 1890-1 to \$26.5 million in 1910.¹⁶⁹ Because of the transportation difficulties this region was not integrated into the plan spaces of most local entrepreneurs until after the district was connected with the rest of Canada by railway in 1898 and even then rail connections and freight rates drew this industry into the orbit of eastern Canadian and British capital.¹⁷⁰ There were demands from both the mining and smelting industry for powered machinery and other capital goods.

We can characterize the resource extractive sector over the period as having seen a boom in terms of gold production in the years 1858 to 1863 followed by a decline which lasted until coal production started to make gains in the late 1870's. The late '70s also saw the dramatic expansion of the fishing industry including the beginnings of the salmon canning and the sealing industry. The mineral industry bottomed out in the four years 1878 to 1882 and then grew steadily for a decade whereupon its value of output skyrocketed through to 1910. Exports of the lumber industry show unsteady growth up to 1889 when records of the timber cut begin. Between 1889 and 1891 the timber cut in B.C. nearly doubled; it more than doubled again by 1899, doubled again by 1905 and again by 1910.

One of the reasons why British Columbia was responsive to and prepared for shifts in supply and demand of primary resources appears to be related to another characteristic of British Columbia over the period under study -- the high degree of local control over the regional economy held by regional entrepreneurs and the limited

¹⁶⁹ Annual Report of the Minister of Mines, B.C. Sessional Papers, 1916, p. K-14.

¹⁷⁰ James Douglas Nicol, "Changing Spatial Patterns in the Lode Metal Mining Industry of British Columbia, 1887-1945," Unpublished M.A. thesis, University of British Columbia, 1971.

involvement of extra-regional entrepreneurs up to 1900.

There is evidence that the regional entrepreneurs were quite successful in obtaining capital to develop the resource industries in addition to financing much of the investment through accumulated savings dating from as early as the 1840's.¹⁷¹ While others have argued that slow growth in the Maritimes can be explained by a lack of entrepreneurial skills it appears that British Columbia both had skilled entrepreneurs and steady growth.¹⁷² Not only did entrepreneurial skills exist in abundance in British Columbia but there does not seem to have been a preference, as Naylor and others have argued, to limit their investments to commercial enterprises. The commission merchants who did the importing and exporting also had investments in sealing, sawmilling, salmon canning, and iron works in British Columbia and R.P. Rithet, one of the most prominent was a major shareholder in a San Francisco Sugar Refinery.¹⁷³

In the years between 1858 and 1915 the extractive industries were an unqualified success in terms of steady growth. Few regions have seen their industrial resource base grow so fast, or so consistently. The growth of these resource industries establishes the context in which we must consider the changing structure and size of the secondary manufacturing sector.

¹⁷¹ Mackie gives the example where local officials of the Hudson's Bay Company pooled \$17,000 from their dividends to start the Vancouver Island Saw Mill and Spar Companies; Mackie, "Colonial Land, Indian Labour and Company Capital," pp. 203-215; D.G. Patterson, "European Financial Capital and British Columbia: An Essay on the Role of the Regional Entrepreneur," in W. Peter Ward and Robert A.J. MacDonald, ed. *British Columbia Historical Readings* (Vancouver: Douglas and MacIntyre, 1981); P.A. Baskerville, "De-industrializing the Island: Vancouver Island and the Industrial World 1881-1901," 1986, Unpublished paper presented to "Islands 86" Conference at the University of Victoria; Morton, *Enterprising Mr. Moody...*, Ralston, "John Sullivan Deas:"

¹⁷² George, *Leader and a Laggard*.

¹⁷³ Naylor, *The History of Domestic and Foreign Capital*; Baskerville, "De-industrializing the Island;" D.M. Thornton, "Victoria's Relative Economic Decline: The Case of the Albion Iron Works," Unpublished B.A. Honours Essay University of Victoria, 1984; Kathleen Sacht, "R.P. Rithet, Merchant-Entrepreneur in Victoria British Columbia 1860-1900," Unpublished B.A. Essay, University of Victoria, 1983; see also Chapter 8.

Chapter Four

The Industrial Frontier -- Primary and Secondary Manufacturing, 1860-1880

While many parts of the Pacific have been longer settled and are more populous and at present more important than Vancouver Island, this colony is likely to become the principal and perhaps only seat of manufactures in the Pacific.

Alexander Rattray
1861*

The original impetus for immigrant settlement in British Columbia had been the rich resource base but even on the frontier resource extraction was one part of a web of economic inter-relationships. However, the preponderance of historical writing on British Columbia has concentrated on the resource industries exclusively. As a result we know very little about the origins of the manufacturing sector in British Columbia.¹⁷⁴

British Columbia in 1860 was a frontier in several senses of the word and it seemed full of potential. The *Fraser River Gold Rush* had been underway for only two years and the Colony of British Columbia had only existed since the start of this rush. Vancouver Island, with its capital in Victoria had been a colony since 1849, but until 1859 had been administered by the Hudson's Bay Company. In 1855 Victoria had a white population of 232, the Colony of Vancouver Island only 774, and British Columbia less than 300.¹⁷⁵

* Alexander Rattray, *Vancouver Island and British Columbia...* (London: Smith, Elder & Co., 1862) p. 101.

¹⁷⁴ The notable exceptions include Lamb's study of sawmills, Fowler's of smelters, Ireland & Laing's on Flour Mills, Adams' on bricks and Mackie's overview of the pre-1858 British Columbia economy: Lamb, "Early Lumbering on Vancouver Island, Part 1, 1844-1855," *British Columbia Historical Quarterly*, II, (January 1938): p. 39; Lamb, W. Kaye, "Early Lumbering on Vancouver Island, Part I. 1844-1855," 31-54, and "Early Lumbering on Vancouver Island, Part II, 1855-1866," *British Columbia Historical Quarterly*, II (1938): 95-144; S.S. Fowler, "Early Smelters in British Columbia," *British Columbia Historical Quarterly*, 3, 3, (July 1939): 183-201; Williard E. Ireland, "Early Flour Mills in British Columbia: Vancouver Island and the Lower Mainland," *British Columbia Historical Quarterly*, V, 2 (1941): 89-109; F.W. Laing, "Early Flour Mills in British Columbia: Part II, The Upper Country," *British Columbia Historical Quarterly*, V, 3 (1941): 191-214; Adams, "Bricks in Pre-1871 Victoria," pp. 3-20. Mackie, "The Economy of Vancouver Island, 1849-1858."

¹⁷⁵ The two colonies were united as the Colony of British Columbia in 1866 which joined Confederation in 1871. Population figures from "Census of Vancouver Island 1855," *British Columbia Historical Quarterly*, Vol. 10, No. 1, 1940, pp. 51-8; and from Ormsby, *British Columbia: A History*, p. 125-7.

When the first flood of miners burst upon Victoria in 1858 there was already a manufacturing sector that served local needs and in some degree, entered the export trade. Among the occupations represented among the property owners on Vancouver Island alone, between 1851 and 1858 were: bakers, blacksmiths, brickmakers, builders, carpenters, coopers, limeburners, millers, millwrights, painters, sailmakers, shipwrights. Oil was manufactured and exported as was timber, shingles, and barrelled salmon (in locally built barrels).¹⁷⁶ With the arrival of over 25,000 miners, most of whom needed supplies, the new demands were met either from expanded local production or largely, from San Francisco: by 1859 Victoria was San Francisco's largest trading partner.¹⁷⁷

The hundreds of thousands of dollars worth of manufactures and foodstuffs filled the holds of many ships, which, when they arrived in Victoria, had no return cargo save perhaps a few cases of gold dust. Manufactures and other provisions imported into the colonies had to bear the full cost of their transportation plus the cost of the return trip which was usually done in ballast. As a result prices in Victoria were 15 percent higher than they were in San Francisco which in turn were four times higher for equivalent goods than London prices.¹⁷⁸ While the high cost of shipping supplies were a source of complaint among the residents of the colonies, they had the effect of giving local industry natural protection against imports.

Victoria was the largest city north of San Francisco. It was an obvious site for a naval base and did eventually become the headquarters for Britain's Pacific squadron. It had the first safe anchorage a ship would encounter north of San Francisco and was

¹⁷⁶ See Mackie, "The Economy of Vancouver Island, 1849-1858," pp. 60, 247-258; John D. Adams, "Bricks in Pre-1871 Victoria: Their Manufacture, Trade and Use," *B.C. Studies*, No. 74 (Summer 1987): 3-20;

¹⁷⁷ J.D. Pemberton, *Facts and Figures Relating to Vancouver Island and British Columbia*. London: Longman, Green, Longman and Roberts, 1860. p. 69.

¹⁷⁸ *ibid.*, 70; Bishop Hill recorded that in Victoria "most things are at least a third above the price in England and many double.... Up the country prices are double and treble [those in Victoria]." Bishop Hill Collection, Correspondence, 1852-1876, text 57, box 3, file 3, Archive of the Anglican Diocese of British Columbia; Rattray says boot prices were twice the British price in Victoria in 1861, *Vancouver Island and British*

closer to Asia than any American port. Its future as a commercial and manufacturing centre seemed assured:

The supply of the Pacific with manufactured goods has hitherto been monopolized by distant countries, especially England and the United States. The development of Vancouver Island, as a manufacturing colony with eminent commercial capabilities, and a favourable geographical position on the shores of the Pacific would unquestionably divert much of this commerce to her own shores; and might ultimately lead to her rivalling, as a manufacturing colony the larger and longer established countries of the East and West Atlantic, and thus make her England of the West.¹⁷⁹

Most important in the new age of steam, Vancouver Island had its own proven source of cheap and good coal at Nanaimo. And thus while California appeared as a potential rival:

no country at the present day which, like California, has to import coal at high prices has any fair prospect of becoming a great manufacturing centre....¹⁸⁰

Glimmerings of British Columbia's untapped potential were starting to be seen. Despite there being very little settlement in the colony of British Columbia in 1860, most settlements did have a manufacturing component.¹⁸¹ Predictably the first industries that developed in British Columbia catered to the most basic needs of the consumers, namely food, beverages, shelter, and fuel. In every census district of British Columbia the first manufacturing industries which developed were sawmills and flour or grist mills. Closely following these establishments were the breweries, bakeries, charcoal burners, clothiers, and sash and door factories.¹⁸²

Columbia..., p. 169.

¹⁷⁹ Rattray, *Vancouver Island and British Columbia*, p. 101.

¹⁸⁰ *ibid.*, p. 103.

¹⁸¹ Paul Phillips, "The Underground Economy: The Mining Frontier to 1920," in *Workers, Capital and the State in British Columbia: Selected Papers*, ed. R. Warburton & D. Coburn, (Vancouver: University of British Columbia, 1988) p. 40.

¹⁸² For example the 1860 Blue Books for British Columbia report a sawmill at each of the listed communities: Douglas, New Westminster, Langely, Yale, Hope, Cariboo, Lytton-Lillooet. The first directory for British Columbia in 1863 lists one or more blacksmith or tinsmith in every community, in Quesnell Forks there was also a bakery, in Lillooet a tailor, in Douglas a waggon maker, and in New Westminster a printer, 2 bakeries, a tailor, 2 gunsmiths, a boot and shoemaker, a builder and a painter. In size and structure the manufacturing component of these settlements compares with that sketched out for rural Nova Scotia in 1861 by McCann. It is consistent with the early export base model sketched out by Gilmour. Ontario by Spelt, F.P. Howard and G. Barnett, *The British Columbian and Victoria Guide and Directory for 1863....* (Howard and Barnett: San Francisco, 1863); L.D. McCann, "The Mercantile-Industrial Transition in the Metals Towns

Cariboo and Yale both had a common "staple" in the placer gold discoveries which rocked the region between 1858-1867. The residentiary manufacturing which accompanied the gold boom was oriented to the milling of grain and sawmilling for local consumption. In 1867 four of the six sawmills in the combined colony were in the Yale, and Cariboo districts.¹⁸⁴ By 1872, Barkerville, the chief town in the Cariboo district had a brewery, sawmill, printer, blacksmith, tinsmith, tailor, and watchmaker and the Cariboo district (including Barkerville) three sawmills, two gristmills and a quartzmill. Lillooet and Clinton had, between them, two sawmills, two flour mills and a joint flour/saw mill.¹⁸⁵

The manufacturing sector in New Westminster developed consistently from 1870 when most workers were employed in one of the three sawmills;¹⁸⁶ the remainder worked in the distillery (which produced 3-400 gallons per month), the grist mill (30 barrels/day),¹⁸⁷ the soda water factory, or for the tailor, baker, furniture maker, boot-maker, printer, fish curer, builder, tinsmith, or blacksmith.¹⁸⁸

But Victoria, as the metropole for the two colonies in the 1860's, developed a wider spectrum of industries earlier than the surrounding area and was primarily a

of Pictou County, 1857-1931," *Acadiensis*, Vol. X, No. 2, p. 30; J. Spelt, *The Urban Development of Development in South Central Ontario*, (Van Gorcum & Co: Assen, Netherlands, 1955) pp. 114-119; Gilmour, *Spatial Evolution*.

* K. MacKenzie is listed as a miller and a baker. His production has been totally allocated to miller.

¹⁸³ Current dollars. For a description of the sources see Appendix 5.

¹⁸⁴ An indication of the scale of production is provided by Langevin: in 1870 sawmills in the interior included one each at Yale and Lytton cutting 7,000 feet per day, 3 mills between Lillooet and Clinton cutting 19,000 feet per day, 1 at Quesnel, 2,500 feet per day; as well as one at Williams Creek and one at Lightning Creek each cutting 20,000 feet per day; H.L. Langevin, "British Columbia: Report of the Honourable H.L. Langevin," in *Canada, Sessional Papers, 1872*, vol. 10, p. 50.

¹⁸⁵ *Mercantile Agency Reference Book for the Dominion of Canada, 1872* (Montreal: Dun, Wigman, 1872), pp. 56-60; Lovell's 1873 Gazetteer also reports Blacksmiths at the towns of Spence's Bridge and Cache Creek: *Lovell's Gazetteer of British North America*, (Montreal: J. Lovell, 1873).

¹⁸⁶ The sawmills, which included the Hastings and the Moodyville Mills cut 183,000 feet of lumber per day. In 1871 there were at least 114 men working at the Hastings Mill. Langevin, "British Columbia," p. 21 and *The Pacific Coast Directory for 1871-1873...* (San Francisco: H.G. Langely, 1871).

¹⁸⁷ *Blue Books of British Columbia, 1870*, (PABC) and; Morton, *Enterprising Mr. Moody and the Bump-tious Captain Stamp*, p. 96; and Langevin, "British Columbia," p. 21.

¹⁸⁸ *Mercantile Agency Reference Book for the Dominion of Canada, 1872*, (Montreal: Dun, Wigman, 1872); *The Pacific Coast Directory for 1871-1873...*

Table 1
Annual Production Estimates for Industries
in Victoria, for 1860 and 1865¹⁸³

Industry	1860		1865	
	Firms	Output	Firms	Output
Bakers	14	\$57,850	18	\$66,480
Blacksmith	7	24,400	3	9,800
Bookbinder	1	n/a	0	00
Boot & Shoemakers	6	21,850	10	16,800
Brewers	2	8,000	3	28,200
Brickmaker	5	13,000	2	5,500
Builders/Contractors	25	180,550	15	37,714
Carpenters	16	54,600	5	4,840
Coach and Waggon Makers	1	3,000	4	14,226
Confectioner	1	n/a	1	800
Cooper	1	1,500	3	4,800
Cutler/Tinker	0	00	3	2,200
Dressmaker	0	00	1	600
Flour Mill*	1	24,000	0	00
Fur Dresser	1	1,850	1	2,000
Gunsmith	1	9,000	2	6,400
Harness & Saddle Makers	2	6,000	3	13,400
Hozier/Glover	1	1,500	1	24,000
Iron Foundry/Machinists	1	12,000	2	22,596
Jeweller & Watchmaker	4	9,850	4	12,470
Limeburner	1	1,900	0	00
Milliner	4	11,950	3	9,000
Opium	0	00	3	n/a
Painter/glazier	9	26,700	5	16,100
Paper Hanger	2	6,000	0	00
Photographer	1	1,500	5	6,100
Plasterer	6	16,550	5	6,750
Plumber/Gasfitter	0	00	1	6,174
Printer	2	20,000	3	53,800
Sailmaker	1	3,000	0	00
Scourer	2	2,850	0	00
Shipwrights/builders	2	21,950	2	27,000
Soda Water/Syrup Maker	2	3,950	1	10,000
Stone Cutters	2	25,000	3	3,088
Tailors	4	15,900	11	22,930
Tinsmith	6	24,000	4	1,226
Tent and Bag Makers	2	11,500	1	2,150
Total	158	591,716	128	428,170

service and manufacturing center. What little is known about the early manufacturing history of Victoria is generally misleading owing to the sources that have been employed, primarily the Blue Books or early directories, because these included only a

small portion of the city's manufacturing.¹⁸⁹ Fortunately however a near-complete survey of the manufacturing output of Victoria from 1860 to 1866 exists in the tax assessment rolls. As a result of Victoria's status as a free port in the 1860's the colonial government was strapped for revenue--the usual custom's duties being denied them. To makeup this shortfall they devised what may have been one of Canada's earliest attempts at business income tax. The colony levied a semi-annual tax on each firm in the city based on their sales (see Appendix 5 for details). Table 1 shows the income of Victoria's manufacturies as they were declared for tax purposes in 1860 and 1865.¹⁹⁰

Among the manufacturers were a foundry employing 20-40 men and making small engines; shipyards capable of building vessels up to 200 tons and about which one observer predicted that there "will soon be greater demand, eg., for fishing, coasters and the exportation of coals." Although "the demand for liquor is great" only two breweries produced "some very indifferent colonial beer" and the bulk of this refreshment was imported from England or the U.S.¹⁹¹ The five brickyards produced at least 120,000 bricks.¹⁹²

The dominance of the building trades among the manufacturies in 1860 suggests the boom and bust nature of Victoria, but this 1860 "snapshot" captured Victoria experiencing a modest bust, the *Fraser River Gold Rush* of 1858 having faded and the *Cariboo Gold Rush* still two years off. Matthew McFie noted the business conditions of Victoria in 1860:

Large sums of money, sent up from San Francisco for investment, were shipped back

¹⁸⁹ See for example Paul Phillips, "Confederation and the Economy of British Columbia," in W. George Shelton ed., *British Columbia and Confederation*. (Victoria: University of Victoria, 1967) p. 157.

¹⁹⁰ For comparison, although one has to do this with much caution, Table 2 lists Victoria's manufacturing output opposite that for the five largest urban centres in Upper Canada at the same time, based on the 1861 census.

¹⁹¹ Rattray, *Vancouver Island and British Columbia*, pp. 105,109,111.

¹⁹² Adams, "Bricks in Pre-1871 Victoria," p. 14.

again, and whole cargoes of goods, ordered during the heat of the excitement, were thrown back on the hands of the merchants. Jobbers had nothing to do but smoke their cigars or play whilst'croaking was the order of the day.¹⁹³

Despite the modest bust the scarcity of labour and its high cost were "great obstacles to the introduction of manufactures as require but few hands."¹⁹⁴

By 1865 the economy had entered a deep depression:

No city on the Pacific Coast occupies a more deplorable position commercially than does Victoria.... A general collapse pervades every branch of business.¹⁹⁵

The effect of the gold rush boom and bust patterns on shipbuilding is evident in Figure 2. From Table 1 it is evident that had dropped 20 percent for Victoria's manufacturers and the building trades suffered the most. Despite the general decline there was growth among the bakers, brewers, founders, waggon makers, harness and saddlers, printers, tailors, upholsterers, hozier/glove makers and shipbuilders.

At the time British Columbia joined confederation, Victoria boasted a small but significant manufacturing industry which catered largely to the demands of the residents despite the fact that the economy had not improved much from five years previous. Credit reports for 1872 report 3 breweries, a sawmill, 3 harness/saddlers, 2 upholsterers, 4 bakers, 5 bootmaker/dealers, 7 tailors, 5 tin/blacksmiths, 2 engine makers, 2 watchmakers, a marble works, carriage maker, cracker factory, coffee/spice mill and a soda water factory.¹⁹⁶ From other sources we know there was also a foundry, a gas works, two tanneries, a soap factory, and 2 sash and door factories.¹⁹⁷ The manufacturing sector had grown despite the fact that in Victoria in 1871:

¹⁹³ Matthew McFie, *Vancouver Island and British Columbia, Their History, Resources and Prospects*, (London: Longman, Green, Longman, Roberts and Green, 1865) p. 71.

¹⁹⁴ Rattray, *Vancouver Island and British Columbia*, p. 117.

¹⁹⁵ Francis Allen, U.S. consul in Victoria, cited in Orin J. Oliphant, *On the Cattle Ranges of Oregon Country*, (Seattle: University of Washington, 1968) p. 56.

¹⁹⁶ 1872 is the first year the credit reports include British Columbia; *Mercantile Agency Reference Book for the Dominion of Canada*, 1872, (Montreal: Dun, Wigman, 1872).

¹⁹⁷ British Columbia Soap Works which was established by W.J. Pendray in 1867; J. Spratt established Albion Iron Works in 1861 which by 1864 employed 50-60 men; See City of Victoria, *Victoria Illustrated*, (Victoria: Ellis and Co., 1891), 81,84; Blue Books of Vancouver Island, 1864, p. 329.

everything was the reverse of prosperity. Some streets are nearly entirely deserted, and there is not a street but what has many, very many houses - both dwellings and stores deserted. Everything looks lifeless and deserted.¹⁹⁸

Production statistics are extremely scarce before the 1881 census for any commodity in British Columbia but they do exist for ships. Due to the strategic nature of shipping substantial ships had to be registered and the *Tables of Trade and Navigation* record the tonnage built in British Columbia. Most historians have ignored the early shipbuilding industry in British Columbia, which was to remain important in Victoria and in the region until after the First World War. The shipyards were occupied through the 1860's and 1870's with the possible exception of 1869-70. Especially in the latter part of century, British Columbian ports were among the major shipbuilding centers in the country [see Figure 2]. Despite the importance of this sector we still know little about this manufacturing industry.¹⁹⁹ In addition to shipbuilding statistics the federal government also kept records of production of beer, spirits and cigars for taxation purposes from 1874. From these we know that 4-5 maltsters and 8-9 brewers kept British Columbians supplied with 130,000-140,000 gallons of beer annually from 1874 through to 1883 when a dramatic expansion occurred (see Figure Three). Four cigar factories turned out between 1,500 lbs and 3,000 lbs of cigars between 1874 and 1880 and thereafter production grew by almost 50% per year through 1885 (see Figure Four). One distillery produced a modest amount of spirits between 1874-1877 and then closed its doors.²⁰⁰ For other industries the only indication of success or failure comes from the directories and the credit reports which show a modest expansion in the numbers of firms and diversity of production through to the

¹⁹⁸ Benjamin Baltzy in the *Montreal Gazette*, June 27, 1872, cited in Andrew Birrell, *Benjamin Baltzy: Photos and Journal of an Expedition through British Columbia in 1871*, (Toronto: Coach House, 1978).

¹⁹⁹ The limited work done so far includes: Eric W. Sager, "The Shipping Industry of British Columbia," paper presented to the Canadian Historical Association Annual Meeting June 1983; G.W. Taylor, *Shipyards of British Columbia*, (Victoria: Morris, 1986). Robert MacIntosh, *Boilermakers in British Columbia*, (Vancouver, Lodge 359, International Brotherhood of Boilermakers, Iron Ship Builders, Blacksmiths, Forgers and Helpers, 1976).

²⁰⁰ Canada, Department of Inland Revenue, "Annual Report," in *Sessional Papers*.

first census in 1881.²⁰¹

The development of manufacturing in Victoria and the secondary urban centres of British Columbia appears to have paralleled developments elsewhere in this era and needs to be considered in a comparative context. No longer can we write about the economy of British Columbia before Confederation and ignore the manufacturing sector. While the composition of the manufacturing economy in 1860 reflected the boom town nature of the British Columbia economy through the 1860's the expansion of the producer goods sector and consumer durable goods suggest a developing and diversifying manufacturing sector. From mid-1860's Victoria's boomtown days had passed and the city had become a service and manufacturing centre for the Pacific northwest, a role it maintained until the late 1890's. The growth and decline of the manufacturing industry beyond the late 1870's is easier to observe thanks to the introduction of the national decennial census in 1880 and is charted in the next two chapters.

²⁰¹ Mercantile Agency Reference Book for the Dominion of Canada, 1872-1880, (Montreal: Dun, Wigman, 1872-1880). *The Pacific Coast Directory for 1871-1873... First Victoria Directory, Fifth Issue, and British Columbia Guide...* (Victoria: E. Mallandaine, 1874); *Guide to the Province of British Columbia for 1877-78*, (Victoria: T.N. Hibben, 1877); *The Pacific Coast business directory for 1880-1...*, (San Francisco, H.G. Langely, 1881).

Chapter 5

Industrial British Columbia

The one great difference between British Columbia and the rest of Canada is that on average a much higher proportion have been on somebody else's payroll and a much lower proportion satisfied farmers or small independent capitalists.

*H.R. MacMillan**

When we speak of one place being more industrialized than another we may be using one of two different criteria. One criteria is output per geographic region. The region with the most manufactured output is thus the most industrialized.²⁰² Using this definition British Columbia ranks seventh, fifth, fifth and third among Canadian provinces and territories in the census years of 1880-1, 1890-1, 1900 and 1910, respectively²⁰³ (Table 3). This definition has obvious problems because of variations in the size and populations of regions. A small region with an economy totally based on factory production may produce less manufactured goods than a larger one that is primarily agricultural but by force of population has an overall manufacturing output which is larger. Which is the more industrialized?

A second measure relates the degree of industrialization by comparing output, value added, or capital employed in manufacturing on a per capita basis.²⁰⁴ The percentage of the population employed in industry is another potential measure of the importance of industry to a region. An aggregate view of the size of the manufacturing establishments can be gleaned by an examination of output, value added or employment per establishment. It is by using these measures that relate industrialization to

* cited in Pierre Berton, "A Native Returns to British Columbia," *McLeans Magazine*, (May 10, 1958).

²⁰² Industry is defined synonymously with the census definition of manufacturing. See Appendix 1.

²⁰³ The manufacturing censuses of 1881 collected data from April 5 of the previous year to April 4 of the census year. The 1891 Census used a census year of April 7 1890 to April 6 1891. The censuses of 1901 and 1911 collected manufacturing data for the previous calendar year, ie. 1900 and 1910.

²⁰⁴ Relative measures are commonly used; see for example: Inwood, "Economic Growth and Structural Change," p. 5.

population and to the number of establishments that British Columbia proves to be "the most industrialized" province in Canada during much of this period.

There is another, implied definition of "industrial" which considers that "heavy industry" or "producer goods" define an industrial economy and that an economy is not industrial until it has a large producer goods sector.²⁰⁵ This definition of an industrial or sometimes "mature" economy is arbitrary, since there are cases where high long term growth rates and incomes have been sustained in economies which lack a strong producer goods sector.²⁰⁶ From the point of view of the export base and dependency theories, however, there is a heuristic value in distinguishing between primary and secondary manufacturing and the producer goods component from other components of the secondary manufacturing sector. These two approaches are formulated in terms of the presence or absence of "linkages" between the resource extractive and primary manufacturing sector and the secondary manufacturing producer goods sector. In the latter part of this chapter and particularly in Chapter 6 and 7 the discussion of the manufacturing sector is considered in terms of these heuristic categories.

At a more fundamental level, however, the process of applying capital and labour to produce goods is common to all manufacturing. Moreover modern manufacturing, whether it be wood processing or the building of engine blocks employs a common "factory" organization of labour, a corporate style of organization of capital as well as other common features which transcend the primary/secondary manufacturing boundary. For purposes of evaluating the "industrial" nature of the economy and the importance of manufacturing, the distinction between primary and secondary manufacturing becomes immaterial.

²⁰⁵ For definition of producer good see Appendix 4. For this implicit definition of industrial see North, "Location Theory..." 252-3; Frank, *Dependent Accumulation and Underdevelopment*, pp. 131-3.

²⁰⁶ British Columbia is in fact one example as is the American Pacific Northwest. Allen, "B.C. Past, Present and Future," Tattersall, "Exports and Economic Growth," pp. 215-6 and Watkins, "A Staple Theory," Pfister, "External Trade and Regional Growth".

One feature that distinguishes the British Columbia frontier from the earlier frontier of eastern North America is that it was so industrial from the beginning.²⁰⁷ The eastern colonies passed through several phases of settlement after the fur trade which included agricultural production, small artisanal production, small water-powered mills, and then in the 1850's and 1860's factory production.²⁰⁸

In British Columbia however, due in part to the late date of settlement, and to the lack of agricultural land, British Columbia skipped these stages and large scale factory production arrived with settlement. From the start, the manufacturing industry developed as a composite of small-scale, traditional workshops and large modern

Table 2
Declared Manufacturing Output in Upper Canada
Urban Centres Compared to Victoria, Vancouver Island, 1860-61
(Figures Not Strictly Comparable)²⁰⁹

I Town	II Population	III All Manufacturing	IV Census Definition of Manufacturing
Victoria	6,000	591,716**	194,710
London	11,555	468,343	312,720
Kingston	13,743	567,540	442,540
Ottawa	14,669	598,630	101,100
Hamilton	19,096	563,766	563,766
Toronto	44,821	739,195	739,195

²⁰⁷ Using a relative measure.

²⁰⁸ One description of this process for Upper Canada is given in J. Spelt, *The Urban Development of Development in South-Central Ontario*, (Van Gorcum & Co: Assen, Netherlands, 1955). See also: John McCallum, *Unequal Beginnings: Economic Development in Quebec and Ontario until 1870*, (University of Toronto: Toronto, 1980).

²⁰⁹ ** This figure is based on a wider definition of manufacturing than that used in Upper Canada. Column IV provides a fairer basis for comparison. See Appendix 5 for a complete discussion of source and bias.

factories representing the newest forms of industrial organization. The large mills and factories were initially oriented to an international market while the smaller craft shops supplied simple local demands for consumer products; within a few years, however, secondary manufacturing industry began to supplant more sophisticated imported products and many workshops grew into factories.

The *First Victoria Directory, 1860*, lists each individual's employer and from this it is clear that many firms consisted of a proprietor, alone or with one or two helpers. Others, like the foundry, or the carriage makers, for example, had a considerable number of employees. In 1861 the largest foundry employed 20-40 men and by 1864 50-60 men.²¹⁰

Alongside the craft shops and small factories which existed on Vancouver Island and in British Columbia were factories as large as any in North America. In 1860 a sawmill was under construction on Alberni Inlet which employed between 200 and 700 men. In daily capacity it was the largest sawmill on the North American west coast. Although this particular industrial giant survived only 5 years before it ran out of profitable timber²¹¹ two other sawmills operating on the same scale had opened on Burrard Inlet before it closed.²¹² These and a small number of other huge mills were the largest employers in the colonies until the early 1870's when salmon canning became a major industry.

²¹⁰ *First Victoria Directory, Comprising a General Listing of Citizens...* (Victoria: E. Mallandaine, 1860); Rattray, *Vancouver Island and British Columbia*, p. 111; Blue Books of Vancouver Island, 1864, p. 329.

²¹¹ The 1864 Blue Books for Vancouver Island list 178 working at the Alberni Mill. McFie, writing about 1863-4 records 200-300 employees and Lawrence records that at height of its production the mill employed 700 men. In 1863 the mill exported 11,273,000 feet of sawn lumber, and 1,300 spars. The Alberni Mill also produced salted fish and fish oil, produce amounting to 470 barrels of the former and 239 of the latter in 1863 as well as 33 packages of furs. McFie, *Vancouver Island and B.C.* pp. 51, 135; and J.C. Lawrence, "Markets and Capital: A History of the Lumber Industry of British Columbia 1778-1952, Masters Thesis, University of British Columbia, 1951, p. 22.

²¹² For example, by 1871 the Hastings Mill had over 114 employees, *First Victoria Directory, Fourth Issue, and British Columbia Guide*, (Victoria: E. Mallandaine, 1871) p. 51

²¹³ * 1900, 1910, and 1915 only include firms with five employees and over.

** The sum of Alberta and Saskatchewan in 1910 and 1915.

Source: *Canada Census, 1881, 1891, 1901, 1911 and Postal Census of Manufacturing, 1915.*

Table 3
Manufacturing Output in Canada by Province
1880-1, 1890-1, 1900, 1910, 1915 in Current Dollars²¹³

	1880-1	1890-1	1900*	1910*	1915*
B.C.	2,962,784	11,916,928	19,447,778	65,204,236	73,624,431
Ontario	157,989,870	240,100,267	241,533,486	579,810,225	718,923,274
Quebec	104,662,258	153,195,189	158,287,994	350,901,656	387,900,585
N.B.	18,512,058	23,685,636	20,972,470	35,422,302	37,832,034
N.S.	18,575,326	30,343,683	23,592,513	52,706,184	70,860,274
P.E.I.	3,400,208	4,333,510	1,696,459	3,136,470	2,646,469
Man.	3,413,026	10,126,082	12,927,439	53,673,609	61,594,184
N.W.T**	195,938	1,844,410	1,964,987	25,120,957	44,755,407

Table 4
Capital Employed Per Manufacturing Establishment in Canada and
by Province 1880-1, 1890-1, 1900, 1910 in Current Dollars²¹⁴

	1880-1	1890-1	1900*	1910*
British Columbia	\$7,030	\$19,058	\$58,423	\$188,982
Canada	3,311	4,670	30,056	64,917
Ontario	3,511	5,514	32,855	74,415
Quebec	3,736	5,060	29,392	49,467
N. Brunswick	2,703	3,065	22,569	31,196
Nova Scotia	1,865	1,832	29,113	53,781
P.E. Island	1,267	1,087	6,232	4,555
Manitoba	3,941	5,521	23,270	109,206
N.W. Territories**	4,354	4,568	16,093	78,916

* 1900 and 1910 only include firms with five employees and over.

** The sum of Alberta and Saskatchewan in 1910.

²¹⁴ Averages based on data given for 1880-1 and 1890-1 in: Canada, Department of Agriculture *Census of Ca-*

For comparison, although one has to do this with much caution, Table 2 lists Victoria's manufacturing output opposite that for the five largest urban centres in Upper Canada at the same time, based on the 1861 census. Despite Victoria's much smaller population, manufacturing output is in general terms, at a comparable level. Especially remarkable is that secondary, not primary, manufacturing completely dominated the manufacturing sector (Table 1). Neither gold nor coal required processing.

Not until the census of 1880-1 do we have data with which to compare all of British Columbia to the rest of the country.²¹⁵ The census of 1880-1 provides the benchmark for the study of B.C.'s economy with the first reliable economy-wide indication of the output, material consumed, and employment. It is the only complete record of the manufacturing sector before the province was connected by the Canadian Pacific Railway to the rest of Canada in 1886. Up to this point British Columbia had been isolated from the rest of Canada by a lack of transportation facilities and protected from the United States and the Pacific Rim countries by tariffs, so the B.C. had been forced to develop as if it were a nation unto itself.

In 1881 the British Columbia population was small compared to the eastern provinces. B.C.'s total population of 49,459 compared to an 1881 population of 1,925,228 in Ontario.²¹⁶ It is no surprise to discover that manufacturing output in British Columbia was very small relative to Ontario's (see Table 3). Yet, small though the whole industry was, relative to the rest of Canada, within British Columbia it was the dominant economic activity. British Columbians were more likely to be working in manufacturing compared to their counterparts in other parts of Canada (Table 8 and 9). Contrary to the common assumption that firms on the frontier are likely to start

nada Bulletin No. 10, (Ottawa: June 1892), p. 4, 20-1; and for 1900 and 1910 in: Canada, Department of Trade and Commerce, *Bulletin I. Fifth Census of Canada*, Ottawa, August 1912.

²¹⁵ British Columbia was just entering Confederation in 1871 and so was excluded from the Dominion census.

²¹⁶ Figures from Canada Census, 1881.

small²¹⁷ the average firm size in British Columbia was larger than that elsewhere in Canada.

There are various measures to compare firm size, each stressing different characteristics of the firm. One such comparison, capital employed per firm, includes a measure of industrialization. High capital ratios suggest the existence of labour-saving machinery, the hallmark of the factory era. Table 4 illustrates the large difference between the average capital invested per firm in British Columbia with the rest of Canada. The British Columbia firm, over the thirty years spanned by these four censuses, was consistently two to three times larger than the national average.

As with the pre-census economy the average firm size varied between industries. Table 5 illustrates that the largest firms in the province tended to be located in the salmon canning and smelting industries. Although they started out smaller, after 1900

Table 5
Average Number of Employees Per Manufacturing
Establishment, By Industry in British Columbia 1880/1-1910²¹⁸

	1880-1	1890-1	1900	1910
Smelting	-	-	147.0	320.0
Log Products	14.7	21.7	44.1	68.6
Lumber Products	15.7	42.4	39.3	135.8
Fish Canning	85.2	170.8	49.1	135.8
Foundries	9.9	40.3	26.0	35.2
Boilers and Engines	5.0	18.0	69.3	62.0
Railshops	-	25.6	n/a	82.0
All other	2.5	5.3	15.3	16.4

²¹⁷ Green, *Regional Aspects of Canada's Economic Growth*, p. 94; Gilmour *Spatial Evolution...* pp. 36-8.

²¹⁸ * Figures for 1900 and 1910 are for firms with five employees and over. Source: Canada Census 1881, Vol III; 1891, Vol III; 1901 Vol III; 1911 Vol. III.

the foundries, boiler makers, and rail repair facilities rivaled the factories in the log and lumber products for a rank in the second tier. The large jump in the average size of all other firms in 1900 is probably largely the result of eliminating firms with less than five employees from the definition of industrial establishment (see Appendices 1 and 2).

Employment per firm provides a proxy for the physical size of manufacturing establishments. On this basis, British Columbia firms ranged from between 33 percent larger than the Canadian average in 1880-1 to more than three times as large in 1890-1. In 1900 when only firms with five or more employees were enumerated British Columbia firms were 25% larger than the national average, and 95% larger in 1910 (see Table 6). Measures of output, or value added per firm show the same relationship

Table 6
Employees Per Manufacturing Establishment in Canada
and by Province 1880-1, 1890-1, 1900, 1910²¹⁹

	1880-1	1890-1	1900*	1910*
British Columbia	6.8	15.2	29.2	51.2
Canada	5.1	4.9	23.2	26.2
Ontario	5.1	5.2	24.8	29.8
Quebec	5.4	5.1	22.8	24.0
N. Brunswick	6.2	4.9	24.1	21.4
Nova Scotia	3.7	3.3	19.6	19.5
P.E. Island	3.5	2.6	11.4	8.5
Manitoba	5.5	4.3	16.1	39.5
N.W. Territories**	1.8	2.9	11.1	22.1

* 1900 and 1910 only include firms with five employees and over.

** The sum of Alberta and Saskatchewan in 1910.

²¹⁹ Averages based on data given for 1880-1 and 1890-1 in: Canada, Department of Agriculture *Census of Canada Bulletin No. 10*, (Ottawa: June 1892), p. 4, 20-1; and for 1900 and 1910 in: Canada, Department of Trade and Commerce, *Bulletin 1, Fifth Census of Canada*, Ottawa, August 1912.

between large British Columbia firms and their smaller counterparts to the east.

Table 7
Manufacturing Output Per Capita and Capital Investment
Per Capita in Canada by Province 1880-1, 1890-1 in Current Dollars²²⁰

	1880-1 Output	1890-1 Output	1880-1 Capital	1890-1 Capital
British Columbia	\$60.00	\$122.10	\$59.70	\$147.00
Ontario	82.10	113.50	42.10	83.50
Quebec	77.00	102.90	43.60	80.00
N. Brunswick	57.40	73.70	26.10	51.70
Nova Scotia	42.10	67.10	23.10	42.20
P.E. Island	31.20	40.00	19.10	26.70
Manitoba	51.70	66.40	20.00	36.60
N.W. Territories**	3.40	27.60	1.86	25.60

Table 8
Proportion of Employees in Manufacturing
to Each 10,000 of the Total Population by Province, 1880-1, 1890-1²²¹

Province	1880-1	1890-1
British Columbia	580	1,175
Ontario	601	782
Quebec	627	782
New Brunswick	620	828
Nova Scotia	452	760
P.E. Island	528	725
Manitoba	580	287
N.W. Territories	19	162

* 1900 and 1910 only include firms with five employees and over.

** The sum of Alberta and Saskatchewan in 1910.

²²⁰ Canada, Department of Agriculture, *Census of Canada, 1891, Bulletin No. 10*, Ottawa: June, 1892, p. 5.

²²¹ Canada, Department of Agriculture, *Census of Canada, 1891, Bulletin No. 8*, Ottawa: 1892, p. 7.

On a per capita basis, British Columbia manufacturing had, in 1880-1, not fully reached the Canadian average, perhaps due to the fact that the participation rate of the population in the manufacturing workforce in 1880-1 was below that of most other provinces. In 1881 over half British Columbia's population was native and they may have had a different participation rate than white settlers.²²² Nonetheless, New Westminster had the highest per capita manufacturing output of any city in Canada in 1880-1! Victoria's per capita output, while not at the top of the nation, still occupied a respectable thirteenth rank of the more than 90 urban centres in Canada.²²³

Table 9
Proportion of Population Engaged in
Each Sector of the Economy by Province, 1890-1²²⁴

Province	Agriculture Mining & Fishing	Trade & Transport	Manufact- uring	Service	Profess- ional	Non- Productive
British Columbia	18.5	7.8	10.6	10.1	1.9	0.7
Ontario	16.3	4.1	7.5	5.2	1.4	0.9
Quebec	14.6	3.4	6.2	4.9	1.1	1.8
New Brunswick	17.3	3.7	5.8	5.4	1.2	0.6
Nova Scotia	18.5	4.0	5.9	5.2	1.3	0.6
Prince Edward Island	20.9	2.3	4.9	3.4	1.1	1.8
Manitoba	22.7	4.2	3.4	4.4	1.4	0.6
North-West Terr.	20.7	3.4	2.5	3.4	2.5	0.3

²²² In B.C. 25,000 or 50.5 percent of the population was native Indian. Compare this to the much smaller percentage of native populations in Ontario which in 1881 recorded 4,678 native Indians, or 0.2 cent of the population. For a discussion of natives in the workforce see: Rolf Knight, *Indians at Work*, (Vancouver, New Star); Green shows the lower participation rate in British Columbia; Green, *Regional Aspects of Canada's Economic Growth*, Table A 2.

²²³ Department of Agriculture, *Census of Canada, Bulletin No. 12*, (Ottawa: July, 1892), 39.

²²⁴ Canada, Department Agriculture, *Census of Canada, 1891, Bulletin No. 18*, Ottawa: August 1893, p. 13.

By 1890-1 however, the provincial participation rate and manufacturing per capita had surpassed all the other provinces. As the authors of the census observed, "British Columbia during the ten years passing from fourth place to first place as *the* manufacturing province of the Dominion in proportion to population."²²⁵(Table 7).

Between 1881 and 1891 the population of British Columbia had increased by nearly 100 percent while the manufacturing output grew by over 300 percent, (see Table 12) compared to a national population growth rate of 12 percent and an increase in manufacturing output of 53.5 percent.²²⁶ More British Columbians, as a percentage of population, were engaged in manufacturing²²⁷ than any other province and Victoria had become the tenth largest manufacturing centre in Canada measured by output, and fifth if measured by value added.²²⁸ Nor, by 1891, was the British Columbia economy any more specialized in the primary sector than the rest of Canada, when the employment of the whole population is taken into account (Table 9).

Over the decade 1891-1900 British Columbia maintained its position as the province with the highest manufacturing output (GVP) per capita.²²⁹ Overall manufacturing output grew more than 60 percent in B.C., from \$11.8 million to \$20.6 million, despite the mid-decade depression, and despite a change in census enumeration which lends a downward bias to the 1901 figures (Table 12).²³⁰ As a result of the elimination

²²⁵ Canada, Department of Agriculture, *Census of Canada, 1891, Bulletin No. 8*, Ottawa: 1892, p. 8.

²²⁶ *Canada Census, 1931*, Vol. 1, p. 152; and *Census of Canada, Bulletin No. 10*, Ottawa: June 1892, p. 4.

²²⁷ British Columbia had a higher proportion of the population engaged in all sectors of the economy because, by 1891 British Columbia had a higher labour force participation rate than any other province. *Canada Census 1901, Bulletin 11*, p. ix; Green, *Regional Aspects of Canada's Economic Growth*, Appendix.

²²⁸ See Peter Baskerville, *Beyond the Island, An Illustrated History of Victoria* (Windsor: Burlington, Ontario, 1986), p. 46; Canada, Department of Agriculture, *Census of Canada, 1891, Bulletin No. 12*, Ottawa: 1892, Table 4, p. 37.

²²⁹ See Bertram, "Historical Statistics," p. 119.

²³⁰ In the censuses of 1901 and 1911 the enumerators were instructed not to collect data on firms with under five employees. The rationale for this requirement was to limit the scope of the census to "statistics of the factory system as distinguished from those of the domestic or hand system of labour" and specifically to exclude small firms engaged in "baking, blacksmithing, basket-making, carpentry, dressmaking, shoemaking, spinning, tailoring and weaving," from the statistics of manufacturing. However, in the 1891 census it was evident that these "domestic or hand trades" comprised a significant percentage of production in British

of the smaller firms from the census the average value of capital employed per firm and the average number of employees per firm appears to sky-rocket in the 1901 census. With the small firms excluded the capital employed per firm in British Columbia was almost twice the Canadian average in 1900. The census of 1911 again illustrates the larger firm size and the capital intensive nature of manufacturing in British Columbia relative to the rest of Canada. The average capital investment per British Columbia firm in 1910 was \$118,982, almost treble the Canadian average of 64,917 (see Table 4) and the average British Columbia firm employed nearly twice as many workers as the average Canadian firm, and 85 percent more than the typical Ontario firm (see Table 6).

British Columbia's manufacturing sector from 1860 to the First World War consisted of a combination of giant scale factories and craftshops, though on average there were more of the former in British Columbia than elsewhere in Canada. Census data reveals that British Columbia differed from the rest of Canada in that British Columbia firms were on average, larger, measured by output, capital or the number of employees. British Columbians were more likely to be working in factories than other Canadians in a wage or piece-work relationship. On a per capita basis, its cities and the whole province were the most industrialized in the country in the 1880's and 1890's. The presence of giant factories points to another feature of this industrial frontier: it was only a frontier from the perspective of central and eastern Canada. From the perspective of the Pacific nations it was, as Ralston and others have argued "a central place."²³¹ The indices show that in the 35 years under consideration Ontario specialized

Columbia, and this exclusion can be expected to add a downward bias to the 1901 figure; *Fourth Census of Canada 1901*, v, vi. For a discussion on how this affects the use of the 1901 figures see Appendix 2.

²³¹ H.K. Ralston, "Patterns of Trade and Investment on the Pacific Coast, 1867-1892: The Case of the British Columbia Salmon Canning Industry," in J. Friesen and H.K. Ralston, ed. *Historical Essays on British Columbia*, (Toronto: 1976), pp. 167-176; J.M.S. Careless, "The Business Community in the Early Development of Victoria, British Columbia," in *Historical Essays on British Columbia*, pp. 177-200.

²³² The index numbers represent British Columbia per capita manufacturing divided by national manufacturing per capita and thus indicate regional specialization in manufacturing. Bertram, "Historical Statistics," Table 6.

Bertram's Index of Regional Specialization in Manufacturing²³²

	1880	1890	1900	1910	1915
B.C.	80.2	125	131	102	86
Ont.	115	117	123	143	152

increasingly in manufacturing while British Columbia declined after peaking in 1900, as the Canadian province most specialized in manufacturing. Bertram concludes that "British Columbia's experience is one of a rapid rise in the index prior to the turn of the century and then apparently a long run decline through 1953."²³³ An index value in excess of 100 in Bertram's index or 1.0 in Pinchin's reveals a concentration above the national average and suggests the region either has a surplus for extra-regional trade or has a consumption of regionally produced goods which exceeds the national average.²³⁴

Yet, while between 1880 and 1910 British Columbians were working in larger factories than their counterparts elsewhere in Canada, the manufacturing sector itself was shrinking relative to the resource extraction industries, the whole economy and

Pinchin's Index of Regional Concentration of Manufacturing Industries²³⁵

	1880	1890	1900	1910	1915
B.C.	1.09	1.55	1.42	1.14	0.85
Ont.	1.16	1.18	1.20	1.45	1.53

²³³ Bertram, "Historical Statistics," Table 6.

²³⁴ For a detailed description on the construction of these indices see Hugh McA Pinchin, *The Regional Impact of the Canadian Tariff. A Study prepared for the Economic Council of Canada*, (Ottawa: Supply and Services Canada, 1979), Appendix A.

²³⁵ Pinchin's index is expressed as a location quotient and equals value added in manufacturing per capita divided by national value added per capita. British Columbia has never regained the degree of specialization it held in 1890-1900. Location Quotients after 1915 are: 1926 - 1.11; 1939 - .97; 1949 - .93; 1959 - .92; 1969 - .85; see Pinchin, *Regional Impact*, Table A - 5; A-16.

the population. Indices of regional specialization in manufacturing created by Bertram and by Pinchin suggest the decline of the importance of manufacturing to British Columbia.

Other work that has been done on centralization of Canadian manufacturing confirms the relative and absolute decline of British Columbia's manufacturing sector, as a whole, starting from 1890. Inwood and Chamard have looked at the centralization of the Canadian economy in the decade 1890-1900 and their estimates demonstrate a substantial real decrease in many of B.C.'s Standard Industrial Category (SIC) manufacturing categories. Robert Allen's set of estimates of sectoral shares of British Columbia Gross Domestic Product suggest that the share of secondary manufacturing peaked in 1890 and has never reached the same share since. Green finds that the share of British Columbia gross value added contributed by manufacturing fell from 23.4% in 1890 to 19.6% in 1910 while in Ontario it rose from 24.6% to 30.1%.²³⁶

Not only was British Columbia becoming progressively less specialized in manufacturing but the structure of the manufacturing sector was also changing. Instead of the progression predicted by the export base model from a concentration on primary manufacturing to a concentration in secondary manufacturing, the British Columbia manufacturing sector was increasingly specialized in primary manufacturing. The next two chapters examine the changing structure of the British Columbia manufacturing industry.

²³⁶ The date 1890 is a reflection of when the census was taken and not an indication that the process started then. While the relative share of primary versus secondary manufacturing is usable in Allen's estimates his figure for the shares of GDP prior to 1920 are unreliable due to his use of secondary manufacturing wages as a proxy for value added in the service sector. Attempts to estimate the sectoral GDP shares prior to 1920 have been unsuccessful due to lack of proxies for the service sector. See: Inwood & Chamard "Missing Artisans," Appendix and; Allen, "B.C. Past, Present and Future," Table 4 and Appendices (unpublished); Green, *Regional Aspects of Canada's Economic Growth*, Tables B-1, B-2.

Chapter 6

Structural Change in the Manufacturing Sector, 1880-1915

Among the bankers and real estate men of Vancouver and Victoria it is constantly asserted that the future lies in manufacturing.... These expectations seem doomed to disappointment....

*W. Martin Swift
Moody's Magazine, 1913**

The census of 1881 provides the benchmark for the study of B.C.'s economy. It is the first reliable indication of the output, material consumed, and employment, and most important, it is the only complete record of the manufacturing sector before the province became integrated with the national economy in 1886.

The census of 1881, with its counterpart in 1891 are also particularly valuable because they listed individual industries, detail that has not been provided by any census since and they enumerated every manufacturer with an annual output of \$50 or over, essentially complete coverage. What is striking about the manufacturing sector in 1880-1 is that secondary manufacturing constituted the majority of the output. Table 11 illustrates the structure of the British Columbia economy for the years 1880-1 to 1910 and illustrates that as early as 1880-1, twenty-two years after the gold rush, secondary manufacturing comprised the 60 percent of all manufacturing output. Secondary manufacturing dominated the manufacturing sector through to 1890-1 but between 1890-1 and 1910 the predictions of the export base model were turned on their heads as British Columbia experienced a relative increase in the importance of the primary sector and a decrease in the relative importance of those indus-

* W. Martin Swift, "The Industrial Future of British Columbia." *Moody's Magazine: The National Investors Magazine*, Special Canadian Number, 15, 6, (June 1913).

²³⁷ B.C. statistics computed from Canada Census (see Appendices 3 & 5) and Ontario statistics from Gilmour, *Spatial Evolution*, p. 35.

Table 10
Gross Value of Production by B.C. Secondary Manufacturing Sectors
1880-1, 1890-1, 1900 and 1910 in Current Dollars

Industry Sector	Gross Value Product 1880-1		Gross Value Product 1890-1		Gross Value of Product 1900*		Gross Value of Product 1910*	
	\$	%	\$	%	\$	%	\$	%
SECONDARY INDUSTRY								
I CONSUMER GOODS								
Food & Drink	537,808	18.5	2,033,436	17.2	4,992,550	24.1	7,093,702	11.2
Sundries	84,545	2.9	303,562	2.6	603,967	6.7	1,938,965	3.1
Clothing & Footwear	307,830	10.6	858,640	7.3	629,846	3.0	383,973	0.6
Semi-Durables	38,910	1.3	209,700	1.8	200,011	1.0	226,333	0.4
Durables	101,270	3.5	556,450	4.7	265,206	1.3	921,125	1.5
TOTAL	1,070,363	36.9	3,961,788	33.6	6,691,580	32.3	10,564,098	16.7
II FINISHED PRODUCER GOODS								
Construction	87,500	3.0	1,264,150	10.7	616,793	3.0	4,278,457	6.8
Supplies to Primary	70,220	2.4	345,520	2.9	119,136	0.6	1,030,216	1.6
Secondary Industries	180,923	6.2	1,391,325	11.8	1,345,807	6.5	6,779,993	10.7
Investment Goods	338,643	11.7	3,000,995	25.4	2,081,736	10.1	12,099,229	19.2
TOTAL	309,220	10.7	426,050	3.6	258,460	1.2	2,337,005	3.7
III UNFINISHED PRODUCER GOODS								
TOTAL SECONDARY INDUSTRY	1,718,226	59.2	7,388,833	62.6	9,081,736	43.7	25,000,332	39.6
TOTAL PRIMARY INDUSTRY	1,184,558	40.8	4,417,728	37.3	11,656,920	56.3	38,077,084	60.4
TOTAL ALL MANUFACTURING	2,902,784	100.0	11,807,411	100.00	20,688,920	100.0	63,077,416	100.0

Source: *Canada Census, 1881, 1891, 1901, 1911*;

* Includes only firms with five or more employees.

Table 11
Employment in Secondary Manufacturing in
British Columbia and Ontario, 1880-1, 1890-1²³⁷

Commodity Sector	1880				1890			
	B.C.		Ont.		B.C.		Ont.	
	Empl.	%	Empl.	%	Empl.	%	Empl.	%
Consumer Goods								
Food & Drink	161	16.4	8,247	10.8	512	14.1	10,357	98
Sundries	88	9.0	2838	3.7	255	7.1	3803	3.6
Cloth. & Footwear	273	27.9	20,498	26.9	609	16.9	29,892	283
Semi-Durables	28	2.9	5,690	7.5	109	3.0	8,293	7.8
Durables	54	5.5	9,384	12.3	330	9.1	13,803	181
Total Consumer Goods	603	61.7	46,657	61.2	1,815	50.2	67,148	62.6
Finished Producer Goods								
Construction Materials	47	4.8	1,378	1.8	636	17.6	3,539	33
Supplies to Primary Tertiary	60	6.1	953	1.2	218	6.0	1,266	12
Investment Goods	135	13.8	12,287	16.1	715	19.2	15,563	14.7
Total Fin. Producer Gds	242	26.9	14,618	19.2	1,569	43.4	20,368	193
Unfinished Producer Goods	132	13.4	14,984	19.6	226	6.3	19,225	18.2
Total 2ndary Manuf.	978	100	76,259	100	3,610	100	105,741	100

tries said to define a maturing industrial economy.²³⁸ In 1880 the British Columbia economy was young and still struggling out of a decade long recession. Two months after the taking of the 1881 census the Victoria newspaper reported:

In spite of the gloomiest forebodings business interests are surely and steadily reviving. The workshops are nearly all busy....milliners and dressmakers have not been as actively employed for many years now. In the clothing and boot and shoe factories there is manifest improvement and some of the proprietors are preparing to enlarge their premises and increase their facilities for manufacturing.²³⁹

²³⁸ Over the whole period 1880-1 to 1910 the primary sector employed more people than the secondary manufacturing sector but the relative share of employment in the primary manufacturing sector increased substantially in the decade 1900 to 1910.

The relative youth of the local economy, the small total population, and especially the small Euro-American population, all suggest a local market, labour force, and a manufacturing sector which are small relative to, for example, Ontario.²⁴⁰ Based on the export base model we should expect the manufacturing sector in B.C. in 1880 to be at an early stage characterized by a few, small firms in each industry, (ie. Sorghum Syrup Factories, Gunsmiths, etc...), a low value added in production, a low gross value of production, and limited diversity.²⁴¹

Table 12
British Columbia Population Growth 1861-1911
Compared to Growth in Manufacturing Output²⁴²

Year	Population	% Change over Decade	Manufacturing Output (\$)	% Change over Decade
1861	51,525	--	--	--
1871	36,247	-29.7	--	--
1881	49,459	36.4	2,902,784	--
1891	98,173	98.5	11,807,411	307
1901	178,657	82.0	20,688,920	75
1911	392,480	119.7	63,077,416	318

²³⁹ *Victoria Colonist*, June 9, 1881.

²⁴⁰ Over half of the British Columbia population in 1880 was comprised of native Indians, compared to much smaller fractions in either of the aforementioned regions. The 1880 census of Ontario recorded 4,678 native Indians, or 0.2 cent of the population. In B.C. 25,000 or 50.5 percent of the population was native Indian. The native population was, in remote places, only marginally integrated into the "white" economy and in most cases were treated as a cheap pool of reserve labour. Anecdotal evidence suggests the natives had a different pattern of consumption than the non-natives.

²⁴¹ James Gilmour, *Spatial Evolution of Manufacturing...* pp. 32-3.

²⁴² Population figures from *Canada Census 1931*, Vol. 1, p. 350; Manufacturing figures from *Canada Census, 1881, 1891, 1901, 1911*.

Gilmore's work on Ontario manufacturing allows a comparison of the relative maturity of the two economies in 1880-1 and 1890-1 based on his own definitions.²⁴³ The manufacturing sector was much larger in Ontario than in British Columbia but in relative terms, between 1880-1 and 1890-1 it is not substantially more mature. Using employment as a proxy for the relative shares of the components of secondary manufacturing as Gilmore does, (Table 11) Ontario had a larger percentage of manufacturing employment than British Columbia in the "mature" consumer durables but less in Producer Goods, finished and unfinished, both also indicators of a developed secondary sector (according to the progression developed from the export base approach in Chapter 2). The pattern also holds true a decade later except that by this time British Columbia had lost its advantage in unfinished producer goods and increased its advantage in the share of finished producer goods. By this measure, British Columbia was the more mature but the small total size of the British Columbia economy suggests that sectoral shares taken alone are not an adequate measure of maturity. Diversity was limited in B.C. in 1880 to 51 different industries, 9 primary and 42 secondary, compared to a Ontario which hosted 139 different manufacturing industries.²⁴⁴ It is clear, though, that the secondary manufacturing sector was not dissimilar, structurally, from that of Canada's largest (by total output) manufacturing province.

In the decade between the census of 1880 and 1890 B.C. witnessed the completion of the CPR, and the Esquimalt and Nanaimo Railway. The CPR, in particular, had the potential to dramatically alter the composition of regional industry. On the one hand, the railway opened up a large potential market for B.C.'s primary and secondary manufactures and provided cheaper transport to areas already served by provincial

²⁴³ Gilmore, *Spatial Evolution*, p. 35; Gilmore only carries his study up to 1891.

²⁴⁴ Dales, "Estimates of Manufacturing Output," p.79. Canada, Department of Agriculture, Census of Canada 1891, *Bulletin 13*, Ottawa (August 1892), 8.

firms. On the other, it is possible that the freshly lowered transport costs might have allowed eastern manufactures to become competitive with B.C. goods and thereby reduce the market share of local manufacturers.

The trend is unequivocal when we examine the primary sector. The increasing exploitation of the salmon resources, and the continuing presence of mining as the key primary industries account for the increase in the GVP of primary manufacturing from \$1,184,558 in 1880 to \$4,408,078 in 1890.²⁴⁵ The diversity of the primary sector changed very little over the decade with essentially the same staples being exported as in 1880. There was however a shift in the relative importance of various primary industries with respect to each other. The relative importance of the salmon canning industry had skyrocketed over the decade to the point where it was rivaling products of the mine as the main export of the province (see Figure 1).

In contrast to the primary sector there was a dramatic increase in the diversity of the secondary manufacturing sector. From 41 different secondary manufacturing industries in 1880, there were 61 a decade later. Because of the growth in population and hence, the local market over the decade, we should expect to find firms entering each industry to capture some of that market while existing firms should have tried to accomplish this activity by increasing firm size. Both a trend towards an increasing number of firms per industry and an increase in the number of employees per firm testify that both of these processes were going on simultaneously, although the relative importance of these two processes varied from industry to industry.

²⁴⁵ My calculations from Canada census. All the available price indices for Canada in this period show a price deflation of from three to ten percent over the decade. See Appendix 7. In other words, a dollar bought more in 1890 than in 1880, so that workers whose nominal wages stayed the same experienced an increase in buying power and hence an increase in "real wages". Although most of the price indexes are based on prices in Eastern Canada they should be relatively comparable, to B.C. If we accept this then all the figures which are presented for 1890 in this paper, which are expressed in nominal dollars, should be viewed as underestimates vis a vis 1880 figures. See Wholesale Price Index, series J1-14, J34-95 and Import Price Indexes J96-107 in M.C. Urquhart, & K.A.H. Buckley *Historical Statistics of Canada*, Toronto: MacMillan, 1965, pp. 291-300.

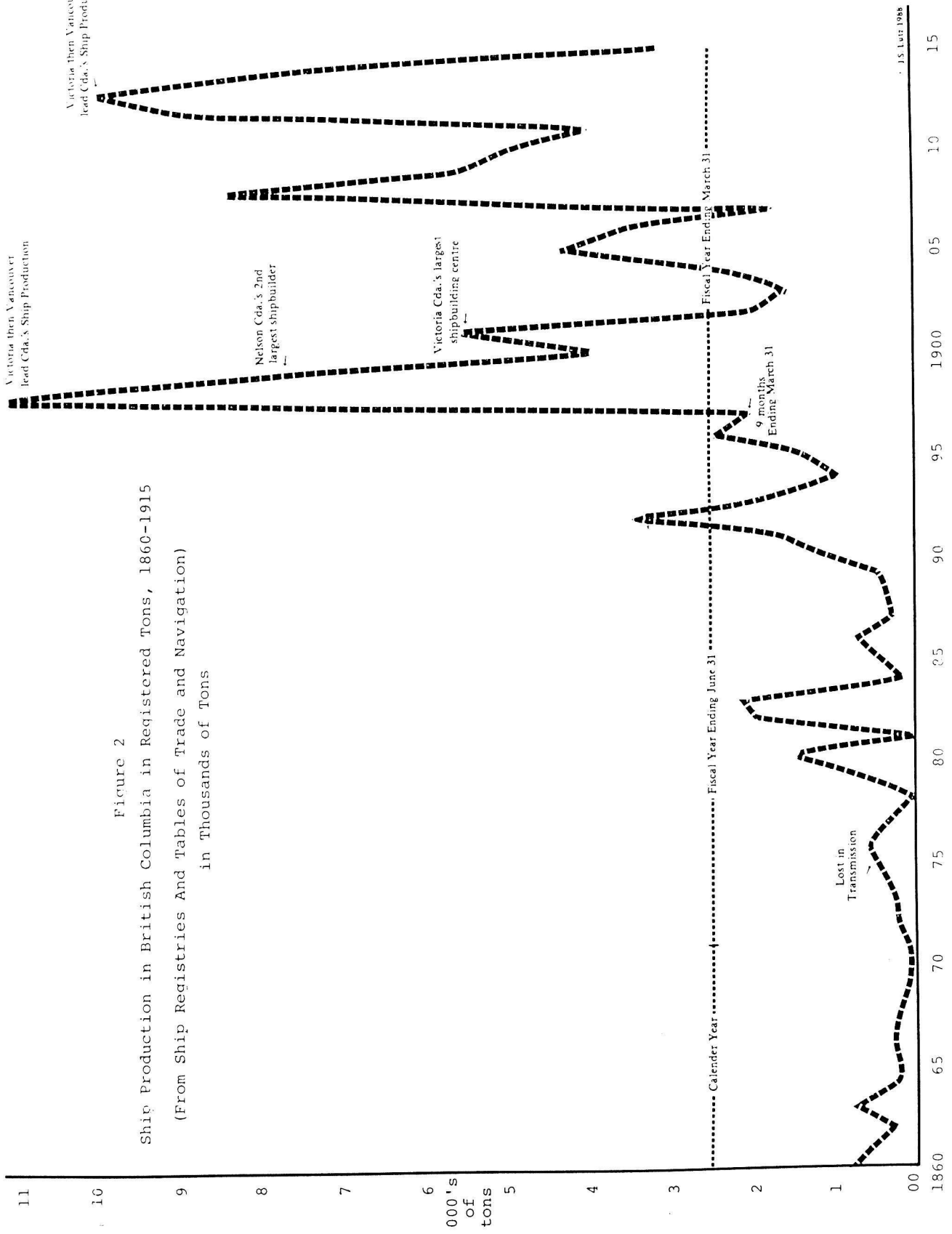


Figure 2
 Ship Production in British Columbia in Registered Tons, 1860-1915
 (From Ship Registries And Tables of Trade and Navigation)
 in Thousands of Tons

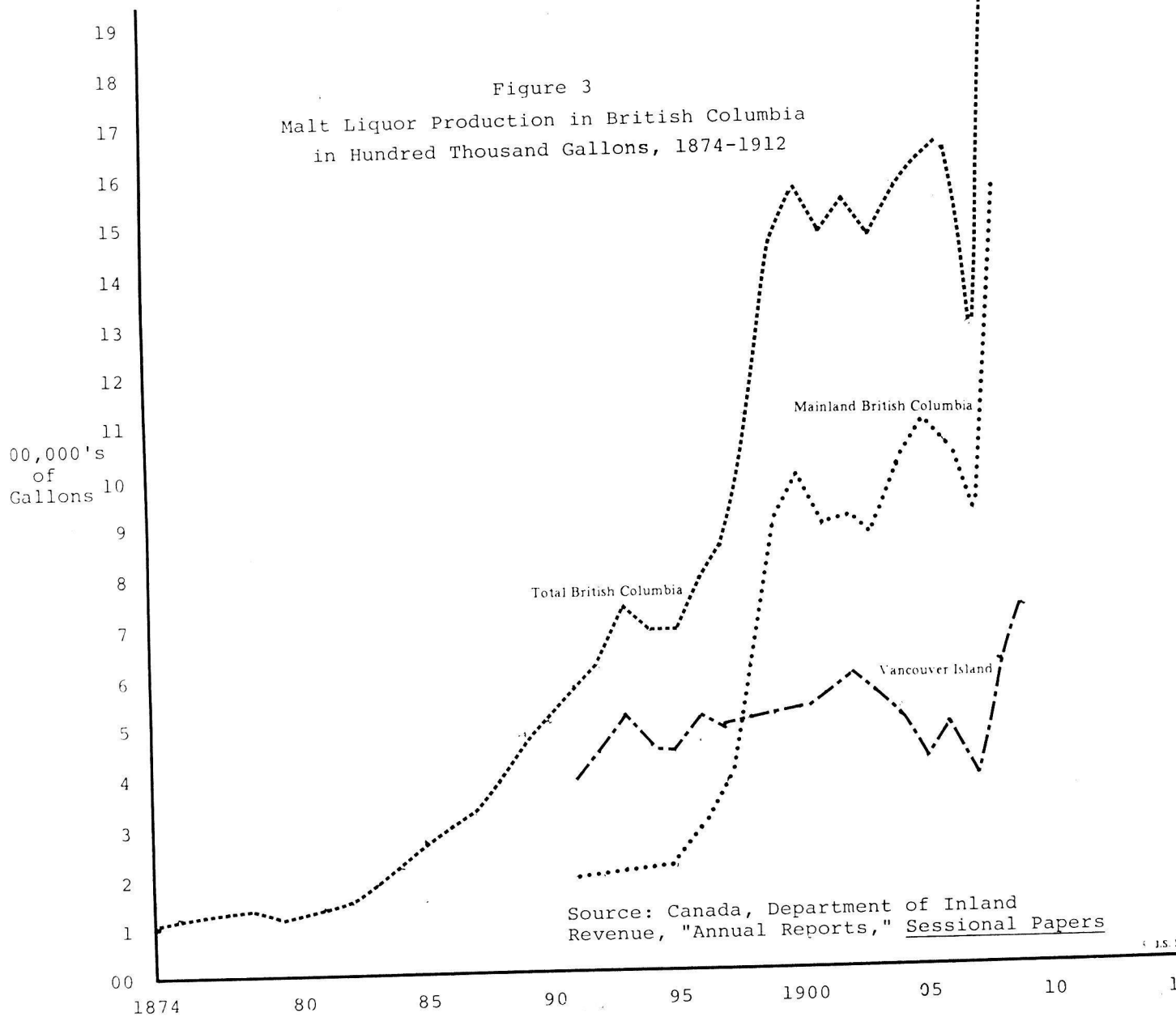
The growth in the manufacturing sector was not led by the primary (staple) manufacturing sector but by the secondary manufacturing sector. Table 12 demonstrates that the secondary manufacturing sector grew from 59 percent of the manufacturing total in 1880 to 62.6 percent by 1890 while the primary manufacturing fell from 40.8 percent of the total to 37.3 percent.

Using a measure of employment, (Table 11) or output (Table 10) the early secondary sector was dominated by the consumer goods sector, particularly food & drink and clothing & footwear. These two components of the consumer sector remained strong in 1890-1 but the importance of consumer durables and semi-durables rose over the decade as did the importance of producer goods, both consistent, to this point, with the export base model.

Figures 3 and 4 show that beer and cigars with bakeries and confectionaries (Appendix 6) led the food and drink sector, increasing by a factor of between 3 and 4 over the decade. The increase in both men's and women's clothing offset the falling production in the boot and shoe industry. All the industries which fell into the producer goods category grew, led by the furniture making and upholstery industry. Overall there was a slight shift of the output to secondary manufacturing and away from primary manufacturing but the trend in employment was in the opposite direction. (Tables 10 and 11).

By the decennial year of 1890 the British Columbia economy had joined the Canadian one, thanks to the ties of the Canadian Pacific Railway, and the Canadian economy was enjoying a round of prosperity which would last into 1892.²⁴⁶ The two boom years that followed the census saw a rapid filling in of secondary industries in the province and an expansion of the primary sector. B.C. Sugar Co., the B.C. Iron Works, a dogfish oil refinery, a shingle mill and a new sawmill were established in

²⁴⁶ After a cyclical low whose trough was hit in 1885; see Bertram, "Historical Statistics," 135.



these two years in Vancouver,²⁴⁷ a woollen mill in New Westminster, and in Victoria, a trunk and box factory²⁴⁸ a roller and oatmeal mill and a paint works.²⁴⁹

Along with diversification came opportunities for provincial firms to begin exporting their products extra-regionally. By 1891, the B.C. Soapworks was shipping up and down the Pacific Coast, and was taking advantage of the connections offered by the CPR to ship soap as far east as Calgary. T.B. Pearson & Co., clothing manufacturers, were shipping their products to Winnipeg²⁵⁰ and B.C. Sugar was supplying the prairie trade eastward as far as Medicine Hat.²⁵¹ By 1894 the paintworks established two years earlier were supplying a "considerable portion of the provincial trade," while a chemical works established in 1893 was shipping to the whole province and parts of the United States. Simon Lieser & Co., furniture manufacturers, were supplying customers in Alaska and the Kootenays.²⁵² Perhaps the most unusual export trade was conducted by the Victoria Rice and Flour Milling Co., established in 1895, which exported milled rice to Hong Kong and Yokohama, after importing the raw product from Hong Kong, Saigon and Bangkok. The company owned the 1,000 ton ship, the *Thermopylae* "kept constantly employed carrying rice for this concern."²⁵³ The establishment of a secondary manufacturing export trade is significant because it indicates that the secondary sector has progressed beyond the stage where it was entirely dependent on the level of local economic activity generated by the primary sector. How large or how sustained the extra-regional exports became is impossible to estimate because this type of data was not routinely collected. However, records were kept for the part of extra-regional trade which was also international trade and there is evidence for the

²⁴⁷ Vancouver Board of Trade, *Annual Report*, 1892, 21-22.

²⁴⁸ *B.C. Commercial Journal*, 1, 1, (March 1891) 12,14.

²⁴⁹ British Columbia Board of Trade, *Annual Report*, 1891-2, 23, & 1894-5.

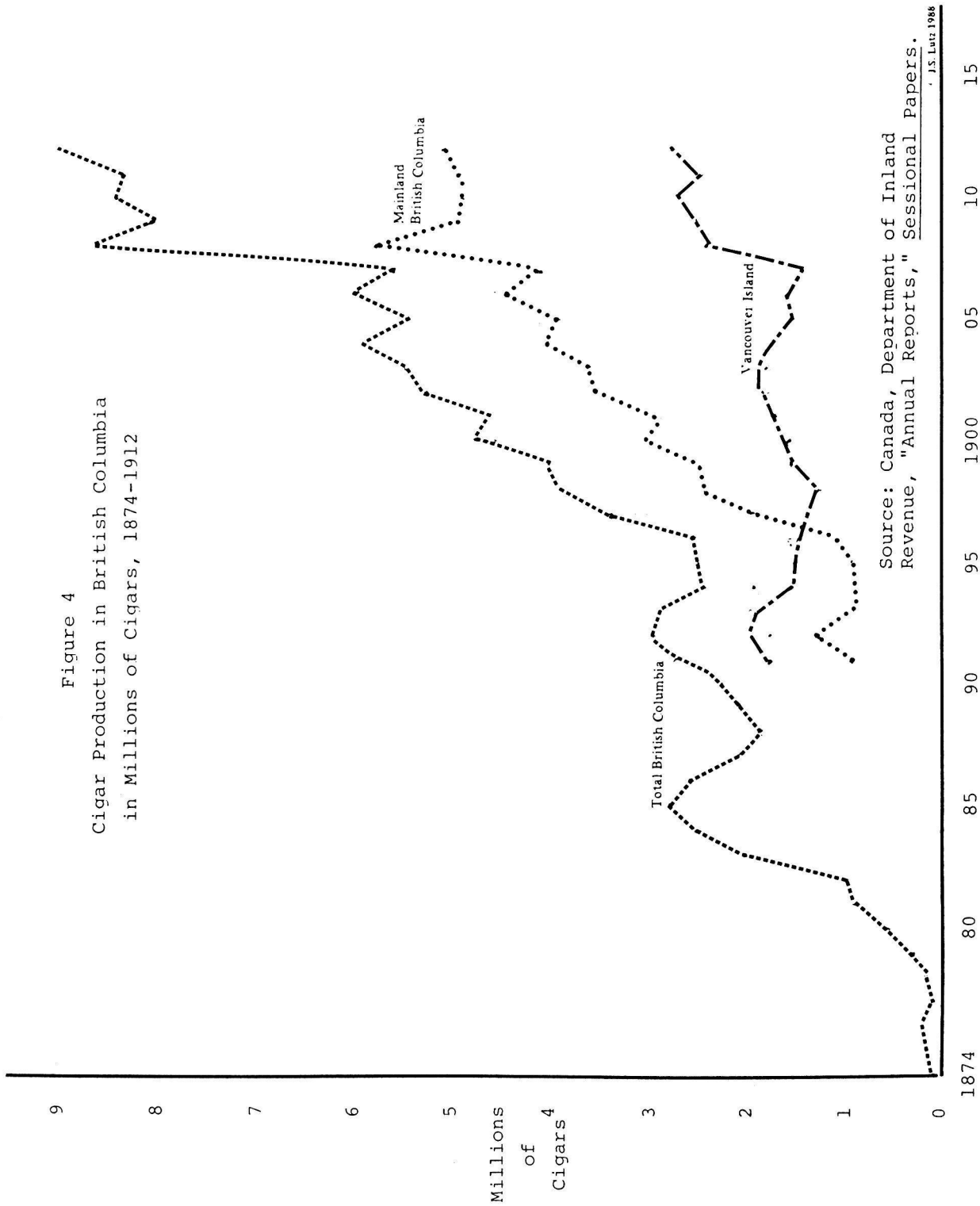
²⁵⁰ *Victoria Illustrated*, (Victoria: Ellis, 1891), 84,86.

²⁵¹ Mary Isabella Rogers, *B.C. Sugar*, (Vancouver: n.p., 1958), 15.

²⁵² B.C. Board of Trade, *Annual Report*, 1894-5.

²⁵³ *Victoria Illustrated*, 80.

Figure 4
 Cigar Production in British Columbia
 in Millions of Cigars, 1874-1912



Source: Canada, Department of Inland Revenue, "Annual Reports," Sessional Papers.

increasing value of a manufactured goods international export trade. Statistics of foreign trade show a steady rise in manufactured exports from British Columbia from the early 1880's up to 1892.²⁵⁴

But in late 1892 this diversification and the burgeoning export trade seems to have ground to a halt as British Columbia was caught up in a world wide depression, exacerbated by an American financial crisis in 1893. The Bank of British Columbia reported that:

nearly all of the leading industries of B.C. and on the Pacific Coast, viz. lumber, grain, coal and fishing, have suffered more or less from the slackness of demand and the extremely low prices ruling.²⁵⁵

The Vancouver Trades and Labour Council was lamenting the "large number of idle workmen," and the mayor of Vancouver was forced to declare personal bankruptcy.²⁵⁶ In Victoria, the flagship of the manufacturing sector, Albion Iron Works²⁵⁷ found the bank "calling attention to the largeness of the company's overdraft and requesting that it might be reduced to the limit of \$50,000 with as little delay as possible." The company which had never posted a profit of less than \$30,000 since being re-organized in 1882, recorded a loss of \$15,801.17 in 1894.²⁵⁸

A variety of indicators suggest that this trough bottomed out in 1895 for the Canadian economy as a whole.²⁵⁹ The three secondary manufacturing industries for which there exist records of annual production through this period, brewing, cigar

²⁵⁴ Economic Council of British Columbia, Research Division, *Statistics of Industry in B.C., 1871-1934*, (Victoria: n.p. 1937), Table I7.

²⁵⁵ *Victoria Colonist*, March 10, 1893, 3. cited in Stanley Edward Ruzicka, "The Decline of Victoria as the Metropolitan centre of British Columbia, 1885-1901." Unpublished M.A. Thesis. University of Victoria, 1973, 43.

²⁵⁶ Norbert MacDonald, "The Canadian Pacific Railway and Vancouver's Development to 1900," *British Columbia: Historical Readings*, ed. Ward & McDonald, 416-17.

²⁵⁷ "The Albion Iron Works stands at the head of manufacturing Industries in Victoria, and is second to none of its kind on the Pacific Coast." *Victoria Illustrated*, 81.

²⁵⁸ See Figure 9, Chapter 7; Albion Iron Works. "Minutes of the Boards of Directors, September 5, 1893; Albion Iron Works, Financial Statements, 1883-1901, 1894.

²⁵⁹ Bertram, "Historical Statistics," 135.

making and ship building all show 1892 as the peak before the 1895 trough (see Figures 2, 3, 4) The Annual Reports of the province's Boards of Trade suggest the same cycle.²⁶⁰

In 1897 the Vancouver Board reported that "the business outlook is decidedly more encouraging than it was 12 months ago" and the New Westminster Board stated that "notwithstanding trade depression, industrial development has been going on in the city." In that year an automatic can factory was under construction in New Westminster, three new sawmills were being built and one expanding, and a brewery was opening at nearby Sapperton.²⁶⁰ In 1899, in the midst of the Klondike boom, the Vancouver Board reported that "It is safe to say that at no time within the past seven years did general business prospects look so bright as at present," and at the end of 1900 "the past year will probably go down in local history as the most prosperous year since incorporation."²⁶¹ By the time the 1901 census was taken British Columbia was again in a prosperity cycle, but on a number of different levels it was not the same economy that was enumerated a decade earlier.

Beside mentioning the changing business prospects over the decade 1890-1900, the Board of Trade Reports also recorded the prominence of "eastern companies establishing branches" as well as remarking on the "purchase by English capitalists of the salmon canneries, previously financed and supplied by (Victoria)."²⁶² Eastern capitalists were making themselves felt in Victoria²⁶³ especially by the presence of Victoria Rice & Flour Milling Co, a branch of Mount Royal Milling and Manufacturing Co. of Montreal. In Vancouver the establishment of the B.C. Sugar Refining Co., financed largely

²⁶⁰ Vancouver Board of Trade *Annual Report*, 1896-7, 12; New Westminster Board of Trade, *Annual Report*, 1897-8.

²⁶¹ Vancouver was incorporated in 1885. Vancouver Board of Trade, *Annual Report*, 1898-9, 1899-1900.

²⁶² Vancouver Board of Trade, *Annual Report*, 1892, 22.

²⁶³ Irene Elaine Robertson, "The Business Community and the Development of Victoria, 1858-1900" Un-

by directors of the Canadian Pacific Railway was representative of the increasing influence of eastern capitalists.²⁶⁴ The role of British and eastern Canadian capital in Vancouver was remarked upon by an investment analysis for Moody's Magazine:

Vancouver...arose before the earth and the soil began to pour wealth in large volume. It came into existence not as a place of exchange, nor yet as a manufacturing center, but more in response to the fiat of eastern capital.

British capital, in seeking investment, poured in to the Canadian west, and said, "let there be a city" and there was a city.... Now the leading citizens are busy finding something for it to do;²⁶⁵

Between the census of 1890-1 and 1900 the manufacturing sector in British Columbia grew 75%²⁶⁶ yet this increase was below the rate of population increase of 82% (see Table 12).²⁶⁷ The difficulty in comparing the censuses of 1891 and 1901 is that the definitions of an industrial establishment changed (see Appendices 1 & 2). But the decline in manufacturing is more than an accounting illusion. Underlying the changing enumeration questions and methods, changes also occurred in the foundation of the manufacturing sector itself.

The primary manufacturing sector, for its part, more than doubled in size over the decade, comprising over 80 percent of the total increase in manufacturing. This jump is partly explained by increased GVP in the fish canning and log products industry of over 70 percent each, but the largest contributing factor was the emergence of a smelting industry which yielded over \$4.5 million dollars in output, up from \$10,500

published M.A. Thesis, University of Victoria, 1981.

²⁶⁴ Rogers, *B.C. Sugar*, 9. This influx of eastern business and manufacturing concerns has also been noted by MacDonald, "The Canadian Pacific Railway and Vancouver's Development to 1900," *British Columbia: Historical Readings*, ed. Ward & McDonald.

²⁶⁵ Swift, *The Industrial Future of British Columbia*.

²⁶⁶ Canadian manufacturing output grew by only 2 percent if we compare gross output according to the census. Taking Inwood and Chamard's estimates and comparing only the output of firms of five employees and over the growth is a more substantial 30 percent. Inwood and Chamard estimate that on this basis the British Columbia manufacturing sector grew 86 percent over the decade. Inwood and Chamard's estimates are discussed in Appendix Two. Moreover the real value of money increased over the decade so current dollar estimates under state real growth. See: Inwood & Chamard, "Missing Artisans," p. 112; *Canada Census 1891*, Vol. 3, Tables XII and XIII.

²⁶⁷ In the decade prior the manufacturing growth rate had outstripped population change by a factor of three to one and in the following decade output grew at a rate twice as fast as population.

in 1890 (See Figure 1 and Appendix 6).

The boom in the smelting industry followed a mineral boom in the Kootenay region which ran through the 1890's. Attempts at operating smelters in the 1889-1891 period faltered and it was not until smelters were "blown in" at Trail and Nelson in 1896 that the industry got on its feet. A boom in smelter construction which added 6 smelters to the provincial roster between 1899 and 1901 was accelerated by the completion of the CPR line into the Kootenays in 1899.²⁶⁹

Table 13
Disappearance of Industries from British Columbia, 1890-1915²⁶⁸

Enumerated in 1891 but not in 1901	Enumerated in 1901 but not in 1911	Enumerated in 1911 but not in 1915
Opium Mfg	Coffee/Spice Mill	Blacksmith
Baking Powder Fcty	Drug Fcty	Ornam. Glass
Trunk/Box Fcty	Electrical Apparatus	Hops Pressed
Chemical Est.	Mattress Fcty	Interior Decorations
Furrier/Hatter	Harness/Saddlery	Metallic Roofing
Sorghum Syrup Fcty	Coke	Patterns
Wigmaker	-	-
Woolen Mills	-	Plumbing Supplies
Incubator Fcty	-	Pulleys
Musical Instr. Fcty	-	Saws
Gunpowder Mills	-	Show Cases
Rope & Twine Fcty	-	Meat Packing
Rubber Factory	-	-
Charcoal Burning	-	-

²⁶⁸ Canada Census, 1891, vol III; 1901, vol. III; 1911, vol. III; Postal Census of Manufactures, 1915. In the case of the trunk and box industry the disappearance may be an illusion of collapsing census categories but the category into which it is collapsed, harness and saddlery disappears the following census.

²⁶⁹ James Douglas Nicol, "Changing Spatial Patterns in the Lode Metal Mining Industry of British Columbia, 1887-1945," Unpublished Master's Thesis, University of British Columbia, 1971, 56-62; S.S. Fowler, "Early Smelters in British Columbia," *British Columbia Historical Quarterly*, 3, 3, (July 1939), 183-201.

Despite the booming primary sector (Figure 1) and the Klondike gold rush the secondary manufacturing sector experienced a relative decline overall and many secondary industries closed their doors for good. Tables 10 and 14 illustrate the relative decline in the secondary manufacturing sector, specifically in those sub-sectors which according to the export base theory define a maturing economy. Overall the share of producer goods, finished and unfinished showed a relative and an absolute decline over the decade, including those industries which supplied goods to the primary sector. The consumer durable and semi-durable industries also experienced both a relative and an absolute decline.

The only sub-sector of the secondary manufacturing sector that kept pace during this decade with the population increase was the consumer food and drink industries which were probably protected by their perishability (see Figures 3 and 4).²⁷⁰ The food and drink sector grew despite the loss of a baking powder and a sorghum syrup factory and lucrative opium industry.

Records of companies that survive make it easy for us to trace the development of successful firms and successful industries but there are very few systematic ways to find out about industries that failed. The census provides a partial answer by taking a "snapshot" of the economy every ten years (five in the case of the postal census) which occasionally captures those industries which failed. The census will of course miss those firms and industries which grew and died between census years but Table 13 provides a suggestion of how many whole industries existed and died in British Columbia between 1891-1915. Some of the industries which declined did so because changing technology or preference reduced consumer demand (ie. harness making) and this was not confined to British Columbia. British Columbia differed from the regions

²⁷⁰ This, despite the fact that many of the smaller firms in the bread, biscuits and confectionary category were probably excluded by the 1901 policy of only enumerating firms with five employees and over. The Opium industry was legal until 1908 but it is possible that public pressure had driven it underground by 1900.

with growing manufacturing bases in that these old manufacturing industries were not replaced by the manufacturing industries which forced the change. When the the high technology growth industries (chemical, rubber, and electrical goods) located in British Columbia they folded within a decade.

It is difficult to know how much of the apparent decline between 1890-1900 in the consumer clothing and footwear category, such as that in the boot & shoe industry, and men's and women's clothes can be accounted for by the decision to enumerate only those firms with five employees or over.²⁷¹ In the case of footwear the declining production in the previous decade suggests that the footwear decline is real and in the case of the clothing industry the closure of the wig factory and the hatter also suggest the real nature of the decline. The decline in the consumer semi-durable sector largely reflects the drop in the production of furniture and upholstery category from \$391,300 in 1890 to \$119,100 a decade later²⁷² the decline of the carriage and waggon industry and the closure of the woolen mill (Appendix 6).

Another sector, directly linked forwardly and backwardly with the primary sector is the producer goods sector, but here too an absolute decline in production took place over the decade, a decline shared by some of the major industries which were already at the factory production level by 1890. While the output of the "log products" (primary sector) industry grew by over 70 percent, the output of the forwardly linked secondary industry, lumber products fell by two thirds, and the output of the shipbuilding sector fell by one half from the 1890 census.²⁷³ The two gunpowder mills

²⁷¹ It was precisely these "hand trades" industries that the census officials wanted to weed out. In 1890 the average employment per firm in this category was 4.4 employees, so this category would have been one of the most severely affected.

²⁷² The elimination of a few small scale carriage manufacturers and the combination of the trunk and box industry (1890 output \$24,000) with harness and saddlery category housed in the consumer semi-durable goods category account for a small part of the decline. See: *Canada Census, 1901*, 3, viii.

²⁷³ Shipbuilding statistics in the census (Appendix 6) appear at odds with statistics in the Tables of Trade and Navigation (see Figure 2). As the economy got more complex the census consolidated their industry categories such that separately tabulated industries in 1890 like sawmills, shingle mills, pulp mills, staves and spool wood were consolidated under the heading "log products in 1901 and 1911. "Lumber products" subsumed planing mills, sash door and blind factories and excelsior. See: *Canada Census, 1901*, 3, viii.

enumerated in B.C. in 1890 were apparently no longer in existence by 1900.²⁷⁴ Foundries experienced dramatic declines, as did the leather and tanning industry, one indication that the apparent decline in boot and shoe makers and saddle and harness makers may in fact be real and not just a product of a definition change (see Appendix 6).²⁷⁵ The only industry to counterbalance these declining and disappearing industries was the boiler making/foundry and machine works combination which experienced modest expansion over the decade to 1900 but even it was to experience a decline in the following 15 years.²⁷⁶

In their series of estimates designed to remove the bias caused by the exclusions of small firms in 1900, Inwood and Chamard record absolute declines in British Columbia's textile industry, non-metal mineral products, iron and steel products, wood products, petroleum and coal products, and declines relative to population growth in the transportation equipment sector, clothing and furs, food and beverages sectors. They record an absolute decline in their commodity sector "Consumer Durable and Capital Goods" after they have compensated for the enumeration change.²⁷⁷

In summary, over the decade 1890-1900 primary manufacturing grew faster than secondary manufacturing; the secondary manufacturing sector went into relative decline and some of the secondary industries were in absolute decline. The growth of the primary manufacturing sector pushed per capita manufacturing output in British Columbia to \$114.31, 31% over the Canadian average in 1901 and has served to mask the decline of the secondary manufacturing sector.

²⁷⁴ A smaller part of the decline in this sector could be attributed to the five employee minimum. In this category blacksmiths, boat builders, and sailmakers were among the firms that would have been excluded as a result.

²⁷⁵ Other industries like tin & sheet iron working and iron & tinsmithing were no longer enumerated as individual industries. Rather the output from these industries, which was relatively small in 1890, was placed with the plumbing & tinsmithing industry, classified as a finished producer good, in 1900.

²⁷⁶ This is the subject of the following chapter.

²⁷⁷ Inwood and Chamard, "Missing Artisans....," pp. 110, 115-117; See Appendix Two.

The decade 1900-1910 was remarkable for its rapid growth in the British Columbia manufacturing sector. British Columbia's population doubled over the decade, and manufacturing output trebled, but the increase in manufacturing output was disproportionately felt in primary manufacturing. In the Consumer Goods Sector only the production of consumer durables and sundries kept pace with the population increase. The output of the Clothing and Footwear sub-sector fell, in absolute terms by 45 percent from \$629,846 in 1900 to \$383,973 (see Table 2) in 1910. This is largely accounted for by the decline of the clothing industry (Appendix 6). Only 4 of the 53 firms producing men's and women's clothing in 1900 still existed in 1910.²⁷⁸ The Consumer Semi-Durables experienced a dramatic decline, relative to both total manufacturing output and to population. This is in part due to the disappearance of the harness and saddlery (which included the trunk and box making industries) sub-sector. Since both censuses enumerated only those firms with five employees and over, no part of this decline is attributable to the change in census definition.

In the Finished Producer Goods there was a filling in of new industries. The increase in the Supplies to the Primary and Secondary Sector is attributable largely to the establishment of two explosive plants. The introduction of two firms producing "artificial ice", a saw maker and a fertilizer plant account for the remainder of the increase. The production in the plumbing supplies and tinsmithing category were up over 1910 but down relative to 1905 (Appendix 6). Twenty percent of the increase in the output of the Finished Producer Investment Goods sector is due to the increase in the value of railway shop repairs and another 11 percent is due to the inclusion of a category for "Housebuilding" in this census. The remaining increase reflects an increase in output in Boiler and Engine Making, Shipbuilding & Repairing, Foundries & Machine

²⁷⁸ *Canada Census, 1901*, Vol. 3 Table 5; *Canada Census, 1911*, Vol. 3 Table IX.

²⁷⁹ D.M. Thornton, "Victoria's Relative Economic Decline: The Case of the Albion Iron Works," Unpublished B.A. Honours Essay, University of Victoria, 1984.

Table 14
Percentage Share of Employment and Production
in British Columbia by Manufacturing Sector, 1880-1910²⁸⁰

	1880-1		1890-1		1900		1910	
	% of empl.	% of GVP	% of empl.	% of GVP	% of empl.	% of GVP	% of empl.	% of GVP
SECONDARY MANU.								
Consumer	21.1	36.9	15.9	33.6	21.9	32.3	8.4	16.7
Finished Producer	8.4	11.7	13.7	25.4	11.2	10.1	17.4	19.2
Unfinished Producer	4.6	10.7	2.0	3.6	1.2	1.2	3.1	3.7
TOTAL SECONDARY MANUFACTURING	34.1	59.2	31.6	62.6	33.3	43.7	29.1	39.6
TOTAL PRIMARY MANUFACTURING	65.9	40.8	68.3	37.3	65.6	56.3	70.8	60.4

shops, in spite of the collapse of Victoria's largest foundry.²⁷⁹

For its part the increase in Finished Producer Construction Goods, appears to be largely the result of the consolidation of census categories and of business enterprises.²⁸¹ The net result of the change in the manufacturing sector over the decade is mixed with growth happening in some of the sectors which characterize an advanced manufacturing economy while in other sectors like clothing, which in some provinces

²⁸⁰ *Canada Census, 1881, 1891, 1901, 1911*. For data manipulation see Appendices 3 & 4. Due to rounding errors columns may not total precisely.

²⁸¹ In 1901 the census categories of sash, door & blind factories, planing mills, and excelsior were combined into one category, "lumber products". Sashes, doors and blinds fall into the Finished Producer Construction Goods category while planing mills and excelsior strictly speaking out to be considered primary construction industries, there being no real distinction between these processes and sawmilling. In the absence of any data to apportion the "lumber products" category it is allocated to the Finished Producer Construction category thereby biasing upward this as well as the total Finished Producer Goods total figure and biasing downward the extent of primary manufacturing. A further complication results from the integrated nature of many of the mills at the time. In 1910 the five mills of the British Columbia Mills Timber and Trading Company produced, in various proportions, rough lumber, planed lumber, wooden boxes, briquets, sashes and doors, and prefabricated houses, making allocation to different commodity categories problematic. For the integrated nature of British Columbia Mills see: Richard Mackie, "For Empire and Industry: Eric Hamber and British Columbia," Unpublished manuscript, 1987. 9-3.

contributed significantly to the overall manufacturing output, there was a substantial decline. Primary manufacturing grew faster and produced more than secondary manufacturing, in distinct contrast to the decade 1880-1 to 1890-1.

The five years 1910-1915 were years of slow growth compared to the previous five, owing in part to a recession in 1913. The log product and lumber product industries suffered a major collapse as a result of this but the smelting and fish canning industries compensated for the decline as did flour mills and butter factories, so the primary sector exhibited overall growth (Appendix 6). In the food and drink sector, bread and confectionary grew with the population but there was a drastic decline in tobacco production. A considerable number of the consumer goods industries closed in the five year period (Table 13) but some, like the carriage and waggon producers and the dressmakers made a strong comeback. The furniture industry which made a modest comeback in the decade 1900-1910 after a drastic production drop, plummeted again to produce less than half of its 1880 production.

In the producer goods sector, the sector that is generally held to define a mature economy there was a virtual collapse. The saw manufacturing plant that appeared in the 1910 census disappeared and there were major declines in both the foundry and boiler and engine building industries.

In the period 1880-1915, the economy of British Columbia did not progress along the stages suggested by the export base approach. The decade 1890 to 1900 was pivotal in that it witnessed an actual "de-industrialization" in many of British Columbia's secondary industries, including some directly linked to the primary industry where the export base approach would predict linkages to be the strongest. This "de-industrialization" also occurred in 1900-1910 though at a much reduced rate, and then again in the five year period 1910-1915. Aside from the consumer food and drink industries, the secondary manufacturing sectors that grew, did so at a pace slower than

population growth and growth in the resource sector.

A macro-study such as this one allows one to discern patterns in the manufacturing sectors but it has difficulty addressing the question of why certain patterns occurred and not others. The next chapter examines the boiler and engine manufacturing sector in detail in order to attempt an explanation for the pattern in that industry.

Chapter Seven

Losing Steam: The Boiler and Engine Industry, 1881-1915

*...the sibilant sound of escaping steam, the whirl of a myriad rapidly revolving wheels, and half as many long connecting belts chasing up and down, pursuing and pursued, as if all were engaged in a field race for dear life against swift winged time, the loud ringing of numerous well plied iron hammers producing a veritable "anvil chorus."**

The *anvil chorus* that was ringing out of Victoria's Albion Iron Works in 1883 sang of promise for the future of the newly formed company, for the city, and for the province. That year Albion, the flagship of British Columbia's manufacturing industry and the province's largest manufacturer of boilers and engines²⁸² posted an annual profit of \$40,692, a return of 22% to its shareholders.²⁸³ The city was just awakening from a slump that had lasted since the late 1870's. With the construction of the Canadian Pacific Railway, the Esquimalt and Nanaimo Railway and the local drydock, Victoria seemed secure in its position as the commercial capital of Canada's west coast.²⁸⁴ More than just a commercial entrepot, by 1890 Victoria would rank tenth among Canadian urban centres in manufacturing output and first among Canadian ports in tonnage entered and cleared; Albion would be the largest iron works north of San Francisco.²⁸⁵

At the end of 1910, however, Albion's *anvil chorus* was no longer being sung in Victoria. The city produced fewer manufactured goods than it had 20 years previ-

* Description of Albion Iron Works in Victoria, B.C. from *Resources of British Columbia*, V. 1, N. 6, Aug. 1, 1883, p. 3.

²⁸² For instance, Albion supplied 71% of all boilers and 75% of engines built in British Columbia and installed in B.C. registered ships, 1871-1891. Data from the Registrar of Shipping and Canada, Department of Steamship Inspection Records, Provincial Archives of British Columbia, (PABC) GR 806.

²⁸³ Albion Iron Works Financial Statements, (PABC).

²⁸⁴ Peter A. Baskerville, *Beyond the Island*, pp. 46-8.

²⁸⁵ Canada, Department of Agriculture, *Census of Canada 1891, Bulletin No. 12*, (Ottawa: July 1892), 39; British Columbia, *British Columbia, Its Resources and Future Possibilities*, (Victoria: Colonist, 1893) p. 76-7; R.T. Williams, *William's British Columbia Directory, 1892*, (Victoria: Williams, 1892) p. 410.

ously. The province which in 1890 had seemed to have already joined the industrial age had instead slipped into the specialization of refining natural resource products. By 1915 census officials enumerated only one firm under the boiler and engine making category where previously Albion had stood along with four others. Despite tremendous growth in the economy the output of the British Columbia boiler and engine manufacturing industry declined dramatically.

This chapter uses the production systems approach to examine the decline of the British Columbia boiler and engine making industry and place this decline into the context of the structural change in the British Columbia manufacturing sector. The structural changes that appear as de-industrialization from a British Columbia perspective are described as "centralization" from a central Canadian perspective so as a result this chapter sheds some light on the process of centralization of Canadian industry before World War I.²⁸⁶ The decline of the British Columbia boiler and engine industry was more than just a regional manifestation of "centralization" but a part of a process of integration of British Columbia and Canada into a world-wide economic system. This examination of the process of regional de-industrialization also illustrates how, in the case of boilers and engines, the expansion of resource industries on the *frontier* was linked to manufacturing growth elsewhere. The boiler and engine case study provides an empirical base from which to test the extent and speed of the displacement of

²⁸⁶ That centralization of manufacturing occurred in this era is generally accepted but there is nothing approaching a consensus on how or why this occurred. See: S.A. Saunders, *Economic History of the Maritime Provinces*, (1939); R. Caves and R. Holton, *The Canadian Economy: Prospect and Retrospect*, (Cambridge, Mass., 1959); A. Faucher and M. Lamontagne, "History of Industrial Development," in Marcel Rioux and Yves Martins, ed., *French Canadian Society*, (1964); Gordon W. Bertram, "Historical Statistics on Growth and the Structure of Manufacturing in Canada, 1870-1957," *Canadian Political Science Association Conference on Statistics 1962-3, Papers*. Canadian Political Science Association, 1963; Green, *Regional Aspects of Canada's Economic Growth*; H. Pinchin, *The Regional Impact of the Canadian Tariff*, (Ottawa, 1979); Ian Drummond, *Progress Without Planning: the Economic History of Ontario, Confederation to the Second World War* (Toronto: University Of Toronto, 1987); John McCallum, *Unequal Beginnings: Agriculture and Economic Development in Quebec and Ontario until 1870*, (University of Toronto: Toronto, 1980); Recent contributions include: Morris Altman, "Economic Development with High Wages: An Historical Perspective," *Explorations in Economic History*, 25, 2, 1988 pp. 198--224 and Morris Altman, "Resource Endowments and Location Theory in Economic History: A Case Study of Quebec and Ontario at the turn of the Twentieth Century," *Journal of Economic History*, VXLV, 7, (Dec. 1986) pp. 999-1009; Inwood & Chamard, "Missing Artisans," See also the literature more specifically written on the decline of the Atlantic provinces vis a vis central Canada, cited below.

regional manufacturers in British Columbia by those from central Canada and the United States and Great Britain. Beyond this, the case study allows an evaluation of some of the explanations advanced to account for the decline of regional economies and the centralization of Canadian industry.²⁸⁷

The boiler and engine industry is important as a sectoral case study because it lies at the heart of the discussion of the centralization of Canadian manufacturing,²⁸⁸ of the relative decline of the Maritime economy and its failure to make the transition from wooden hulls and wind power to iron/steel hulls and steam power²⁸⁹ and is fundamental to the debate over the rise of Ontario relative to Quebec as a manufacturing centre.²⁹⁰ As a key component of the SIC (Standard Industrial Classification) Iron and Steel Category, and of what Dales and Gilmour call the Finished Producer Investment Good Sector, the boiler and engine industry is generally regarded as an index of industrial maturity.²⁹¹

²⁸⁷ Several authors have argued that the debate over centralization has been long on rhetoric and short on data and that a case study approach provides the most promising avenue of analysis, see; Inwood and Chamard, "Missing Artisans," p. 109; Green, *Regional Aspects of Canada's Economic Growth*, p. 68

²⁸⁸ From Pinchin:

The massive increase in concentration of Canada's manufacturing sector in Ontario between 1880 and 1915 was above all due to the rapid growth of the Canadian iron and steel industry (primary iron and steel and industrial machinery) in this region.

Regional Impact of the Canadian Tariff, p. 108.

²⁸⁹ See Saunders *Economic History of the Maritime Provinces*; L.D. McCann, "The Mercantile Industrial Transition in the Metal Towns of Pictou County, 1857-1931" *Acadiensis*, X, 2, (Spring, 1981) pp. 29-64; P. Felt and L. Felt, "Capital Accumulation and Industrial Development in New Brunswick," in L. Fischer and E. Sager, *Merchant Shipping and Economic Development in Atlantic Canada*, (St. John's, 1979) pp. 57-70 and Acheson, "National Policy," George, *Leader and Laggard*, p. 10.

²⁹⁰ Faucher and Lamontagne, "Industrial Development," pp. 259,260,264; Altman, "Resource Endowments"; See also D. Kerr, "Geography of the Iron and Steel Industry of Canada," *Economic Geography*, 35 (April, 1959) pp. 151-63.

²⁹¹ Altman, "Resource Endowments," Table 2 shows that in 1900 boilers and engines made up half the output and accounted for half the employment in the SIC Iron and Steel Category. See: J.H. Dales, "Estimates of Canadian Manufacturing Output by Markets, 1870-1915," *Papers*, Canadian Political Science Association Conference on Statistics 1962 and 1963; and James Gilmour, *Spatial Evolution of Manufacturing: Southern Ontario, 1851-1891*, (Toronto: University of Toronto Department of Geography, 1972), p. 40; Bertram, "Historical Statistics."

Table 15
Engines and Horsepower Used by Primary and Secondary Manufacturing
Industries in British Columbia, Census Years 1890-1, 1900 and 1910²⁹²

	Steam		Gas		Electric		% of all H.P.
	No.	H.P.	No.	H.P.	No.	H.P.	
1890-1							
Primary Mfg.	-	-	-	-	-	-	-
Brick/Tile/Pottery	-	355	-	-	-	-	2.9
Fish Canning	-	674	-	-	-	-	5.6%
Flour/Grist Mill	-	386	-	-	-	-	3.2
Log Products	-	6,865	-	-	-	-	57.0
Lumber Products	-	938	-	-	-	-	7.8
Smelting	-	90	-	-	-	-	0.7
Total Primary Mfg.	-	9,308	-	-	-	-	77.3
Total Secondary Mfg.	-	2,732	-	-	-	-	22.7
1900							
Primary Mfg.							
Fish Canning	70	631	1	4	1	5	2.7
Flour/Grist Mill	5	328	-	-	7	75	1.8
Log Products	194	15,397	-	-	3	47	67.1
Lumber Products	12	540	-	-	2	10	2.4
Smelting	34	2060	-	-	-	-	8.9
Total Primary Mfg.	315	18,956	1	4	12	137	82.9
Total Secondary Mfg.	100	3,092	12	98	37	741	17.1
1910							
Primary Mfg.							
Brick/Tile/Pottery	20	1,173	-	-	3	92	1.4
Butter/Cheese	16	133	-	-	-	-	0.1
Fish Canning	70	649	16	168	9	78	1.0
Flour/Grist Mill	5	211	-	-	2	100	0.3
Log Products	486	43,107	10	71	84	3,837	50.3
Lumber Products	56	6,321	1	6	97	2,275	9.2
Smelting	56	3,909	-	-	76	7,625	12.4
Total Primary Mfg.	673	54,197	27	241	266	13,915	74.8
Total Secondary Mfg.	250	15,715	49	292	475	9,025	25.2

²⁹² Log Products include shingle and saw mills, Lumber Products include planing, moulding, and sash

This study is particularly relevant since the period 1870-1915 was the "age of iron and steam". It saw both the heyday of steam power and the first industrial applications of the internal combustion engine.²⁹³ The boiler and engine industry supplied the power which drove the Canadian industrial revolution²⁹⁴ and was one of the fastest growing sectors of the North American economy. The internal combustion (gas) engine, especially was the innovative, "high technology" industry of its day.²⁹⁵

Finally, the development of the boiler and engine industry provides a means to test the standard "staple" or export base theory because of the close backward linkages to all the resource sectors in the late nineteenth and early twentieth centuries in British Columbia. The resource industries needed power and the closest backward linkage to secondary manufacturing was to the boiler and engine makers who could supply it. As early as 1860 saw and flour mills were using steam power and Victoria's lone foundry, the forerunner of Albion Iron Works, was producing steam engines. In 1861 a visiting naval officer remarked on the linkages between foundries and the resource industries:

As a commercial, manufacturing and mining colony where engines, boilers &c., are likely soon to be in great demand for steamers, railways, engines, sawmills, &c., &c., foundry work will become an important branch of manufacture in Vancouver Island.²⁹⁶

Table 15 demonstrates how directly the manufacturers of boilers and engines were tied to the resource processing sector. The saw and shingle mills alone accounted for over half the steam engines and horsepower used in all British Columbia factories

and door factories.

Source: Canada Census 1861, Bulletin No. 8, p.20; 1901, Vol. III, Table VI; 1911, Vol. III, Table VI.

²⁹³ Jeremy Atack *et al.* "Regional Diffusion and Adoption of the Steam Engine in American Manufacturing." *Journal of Economic History*, 40, 2 (1980): 281-308. P. W. O'Bannon and M. Schmitz. "Technological Change in the Pacific Coast Salmon Industry 1900-1925: A Case Study." *Agricultural History*, Vol. 56, No. 1, (January 1982) p. 162.

²⁹⁴ This is especially so in British Columbia where by 1900 steam provided over 93% of industrial power; Canada Census, 1901, Vol. III, Table VI.

²⁹⁵ Inwood, "Economic Growth and Structural Change," p. 10; and Atack *et al.* "Steam Engine in American Manufacturing".

²⁹⁶ Rattray, *Vancouver Island and British Columbia*, (1862), p. 111.

between 1890 and 1910. Primary manufacturing alone accounted for three quarters of the horsepower used. Moreover, the figures in Table 15 understate the extent of the linkages between the resource sector and the boiler and engine makers because it doesn't capture the increasing use of steam powered "donkeys" to yard logs in the bush,²⁹⁷ or steam engines used to haul ore at the mines. Table 1 also excludes fish boats which increasingly relied on steam and gas power, as did the sealing and whaling vessels. Even agriculture was adapting the steam engine to tractors and harvestors.²⁹⁸ Finally the transportation sector, in so much as it was used to haul resources, was a backward linkage of the resource sector and it was demanding growing numbers of boilers and engines (see Figures 5-10). According to the staple or export base theory the production of boilers and engines ought to grow in proportion to the "linked staples" once initial thresholds are reached.²⁹⁹

Partly by coincidence, but partly owing to the importance of the industry there is good documentary data on the production of boilers and engines available from the decennial census for the years 1880-1, 1890-1, 1900, 1910, and the postal censuses of manufacturing in 1905 and 1915; data on the use (consumption) of engines was published in the 1901 and 1911 censuses. Because of the danger of explosion, boilers became the first industrial products in British Columbia to be routinely inspected by the government. Information on the manufacturer and purchaser of all boilers installed in ships operating in B.C. was routinely collected and records survive for the

²⁹⁷ A detailed discussion of the backward linkages of logging see: Patricia Marchak, *Green Gold: The Forest Industry of British Columbia*, (Vancouver: University of B.C., 1983) pp. 8-13; Robert D. Watt, "Early British Columbia Sawmill Machinery: 1869," *Material History Bulletin*, No. 21, (1977) pp. 47-54; R. Griffen, "Shingle Sawing Machinery in B.C. 1901-1925," *Material History Bulletin*, No. 13, (Fall 1981) pp. 21-38.

²⁹⁸ The increasing use of steam engines in the mining, fish processing, logging, sawmilling and agricultural sectors is recorded in the annual "Report of the Chief Inspector of Machinery," *British Columbia Sessional Papers*, 1902-1915. For details on the interlinkages of specific resources and manufacturing sectors see: Duncan Stacey, *Sockeye and Tinsplate: Technological Change in the Fraser River Canning Industry, 1871-1912*, (Victoria: B.C. Provincial Museum, Heritage Record No. 15, 1982). O'Bannon and Schmitz, "Technological Change in the Pacific Coast Salmon Industry 1900-1925," pp. 151-171; Griffen, "Shingle Sawing Machinery in B.C. 1901-1925."

²⁹⁹ See the discussion in Chapter 2.

period 1860-1910.³⁰⁰ The same information was collected during inspections of land based boilers as a result of the British Columbia Steam Boiler Inspection Act of 1901.³⁰¹ The Register of Shipping provides a further set of data which runs from 1860, recording the manufacturer, specifications, and owners of all engines installed on ships registered in a British Columbia port.³⁰² These "market" statistics are presented alongside evidence from the business records of Albion Iron Works, B.C.'s single largest supplier of boilers and engines before 1900. The combination provides six independently collected sets of data which describe some aspect of the production, use, ownership, and the relationship between owner and supplier of boilers and engines, over all or large parts of the period under study.³⁰³ Moreover, the boiler inspectors, who compiled much of this information, were in a privileged position, as one of them noted in his 1908 report:

As you are aware, Sir, few Government officials (or others, for that matter,) have the

³⁰⁰ Canada, Steamship Inspection Records, Provincial Archives of British Columbia, (PABC) GR 806.

³⁰¹ The original inspection records have not been located for all the stationary boilers but the place of manufacturer and the region of the province that they were installed in is available from the annual reports of the B.C. Inspector of Machinery. Printed in B.C. Sessional Papers 1902 to 1915.

³⁰² Canada, Registrar of Shipping. For the period under consideration British Columbia had three ports of registry: Victoria, which opened either in or before 1860, New Westminster which opened in 1880 and Vancouver which was declared a port of registry in 1890. Registries for Victoria, 1867 to 1908, New Westminster for 1880-1913 and Vancouver for 1890-1898 are available at the National Archives of Canada (NAC) on microfilm. Copies of some of these are also located at the PABC as are the registries for Victoria, 1860-1866. Beyond these dates the registries for Victoria are kept at the Victoria Custom's House with the exception of the Registry from 1908-1911 which is presently missing. The unmicrofilmed registries for New Westminster and Vancouver are held at the Vancouver Customs House.

³⁰³ Of course none of these sources are without their bias. Production data may be skewed by virtue of the fact that foundries occasionally produced boilers and engines and boiler factories may have produced other commodities. As a check I have provided figures both for the boiler/engine industry and the larger secondary iron and steel industries which include makers of agricultural implements, fabricated steel, structural steel, hardware and tools, household, office and store machinery, machines and boilers, primary iron and steel and wire products. None of these records of usage capture engines (or, before 1902, boilers) that were exported from British Columbia but the Tables of Trade and Navigation illustrate that these were rarely exported internationally. Neither are engines that were shipped to points in Canada east of the B.C. Alberta border captured. The evidence does show that outside the Lower Mainland of British Columbia, B.C. engine makers had a hard time competing with eastern manufacturers even within B.C. and the closer one gets to the Alberta border the less success B.C. engines had. As a result it seems unlikely that there was substantial "exports" to other provinces. The available data does not allow us to capture ship engines installed in vessels that were not registered nor does it capture stationary engines. Atack et al, record that in the western United States, however, the steamship market was the first and largest consumer of steam engines and in British Columbia the vast majority of these were registered. Moreover, there is no *a priori* reason to suspect that the purchasing/consumption patterns should vary between registered and unregistered vessels nor between stationary steam engines and the steam boilers (for which we have data) which they inevitably required. Atack et al, "Steam Engine in American Manufacturing".

same opportunity of "feeling the pulse" of general industry as your Inspectors of Boilers, for as "coming events cast their shadows before," so do we become aware of increased industry by reason of going over the specifications of new plants, the additions to existing ones, and the inspection of dormant steam plants which are again to be put in operation.³⁰⁴

Noting one "shadow" the inspector added "the past year has not been a very bright one in manufacturing and industrial branches."³⁰⁵

Table 16
Production Statistics of the British Columbia Boiler and Engine Making
Industry For Census Years 1880-1915³⁰⁶

Year	Est.	Capital \$	Empl.	Wages \$	Materials \$	Gross Output \$
1880-1	2	6,300	5	4,100	3,000	8,600
1890-1*	1	26,000	18	10,000	50,000	75,000
1900	3	739,200	-	181,400	100,150	367,025
1905	4	990,522	343	216,040	n/a	450,320
1910	5	601,728	310	232,116	213,075	607,216
1915(1)	1				95,633	367,198
1915(2)	1				31,878	122,399

³⁰⁴ S. Baxter in "Report of the Chief Inspector of Machinery" *British Columbia Sessional Papers*, 1909, p. M11.

³⁰⁵ *Ibid.*

³⁰⁶ As there were less than three firms in this industry the individual industry figures were not published. The figures for 1915 are estimates derived from subtracting the known output of Boiler and Engine manufacturing firms in Ontario, Quebec, and Nova Scotia from Canadian 1915 totals. The production listed here under 1915(1) is the remaining national total which was comprised of the output of one firm each from B.C., Manitoba and P.E.I. As such it is the theoretical and practical maximum that would be accounted for by the B.C. firm if the firms in Manitoba and P.E.I. had zero output. The production opposite 1915(2) is probably much closer to the actual B.C. production and is the total production of the B.C., Manitoba, and P.E.I. firms divided by three. Using either estimate it is clear that production in this industry fell by at least 40% and probably closer to 80% in the five years 1910-1915.

* For discussion about the reliability of the figures for 1890-1 see Table 17; Source: *Canada Census* 1881, Vol. III; 1891, Vol. III; 1901, Vol. III; 1911, Vol. III; and the Postal Census of Manufacturing, 1905, 1915.

One of the shadows that the boiler inspectors could see was the declining fortunes of the industries located in what is now called the Iron and Steel (SIC) Category. Overall the whole SIC category containing boiler factories, engine factories, foundries, machine works, specialized engine and foundry work etc. exhibited a pattern closely paralleling the whole secondary manufacturing sector declining relative to both the British Columbia and Canadian economy.

Location Quotients: British Columbia Iron and Steel Fabricating Industry³⁰⁷

1880	1890	1900	1910	1915
0.40	1.14	0.59	0.54	0.25

If we go further and isolate the boiler and engine making sub-sector as a case study we see the same general pattern of decline occurring, with two differences. First, the decline in this industry is five to ten years behind the general decline in the secondary manufacturing sector and the SIC Iron and Steel category, and second, the decline is not just a relative one (See Table 16). Census coverage problems together with problems of allocating the production of establishments to the SIC commodity groupings caution against relying too heavily on the census data, but the same pattern of industrial decline is independently verified by the share of the British Columbia market for boilers and engines, held by local manufacturers.

All three markets for the products of the boiler and engine industry for which we have evidence³⁰⁸ exhibit the same trend when we explore how much of the British Columbia market was being captured by local firms. Local manufacturing displaced

³⁰⁷ See Pinchin, *Regional Impact*, Table A-16. For explanation of location quotients see Chapter 5. For the decade 1890-1900 Inwood and Chamard record a real decline of 6%, relative to a population growth of 48%, in the Iron and Steel SIC Category after extracting the effects of the changing census definitions. Inwood and Chamard, "Missing Artisans," Appendix.

³⁰⁸ After 1902 all boilers for stationary engines (not supplying steam to engines powering either boats or trains) and boilers installed on marine vessels were inspected annually and so boiler records are essentially complete (they exclude railway locomotive boilers). Prior to 1902 boiler records are for those on marine vessels only. Despite this partial coverage there is no *a priori* reason to expect sampling bias; further the post 1902 market-share trend in both types of boilers is very similar. Engines records are for those installed on ships only. There doesn't appear to be any reliable way to tell what share of all engine production this accounts for or what sampling bias this sample may include.

Figure 5

Percentage Share of the B.C. Boiler and Engine
Market Held by B.C. Manufacturers, Five Year Intervals
1860-1915



Source: see text.

imports and captured the dominant share of the market very early. Even in the five year period before Confederation British Columbia firms produced 60% of the marine boilers installed in the colony and this figure had reached nearly 90% ten years later. British Columbia manufacturers were less successful in displacing foreign engines but still supplied two thirds of the local marine engine market by the five year period 1881-5. But the regional effect of the "National Dream" was obvious even in the first five years after the completion of the Canadian Pacific Railway (CPR) in 1886 as the share of the market held by local manufacturers plummeted, and fell again in the 1891-5 period. The *Klondike Gold Rush* spurred a modest recovery for the British Columbia firms, which were well located to take advantage of the increased demand for shipping (see Figure 2), but this too had peaked before 1905 and the market share of British Columbia firms steadily eroded through to World War I.

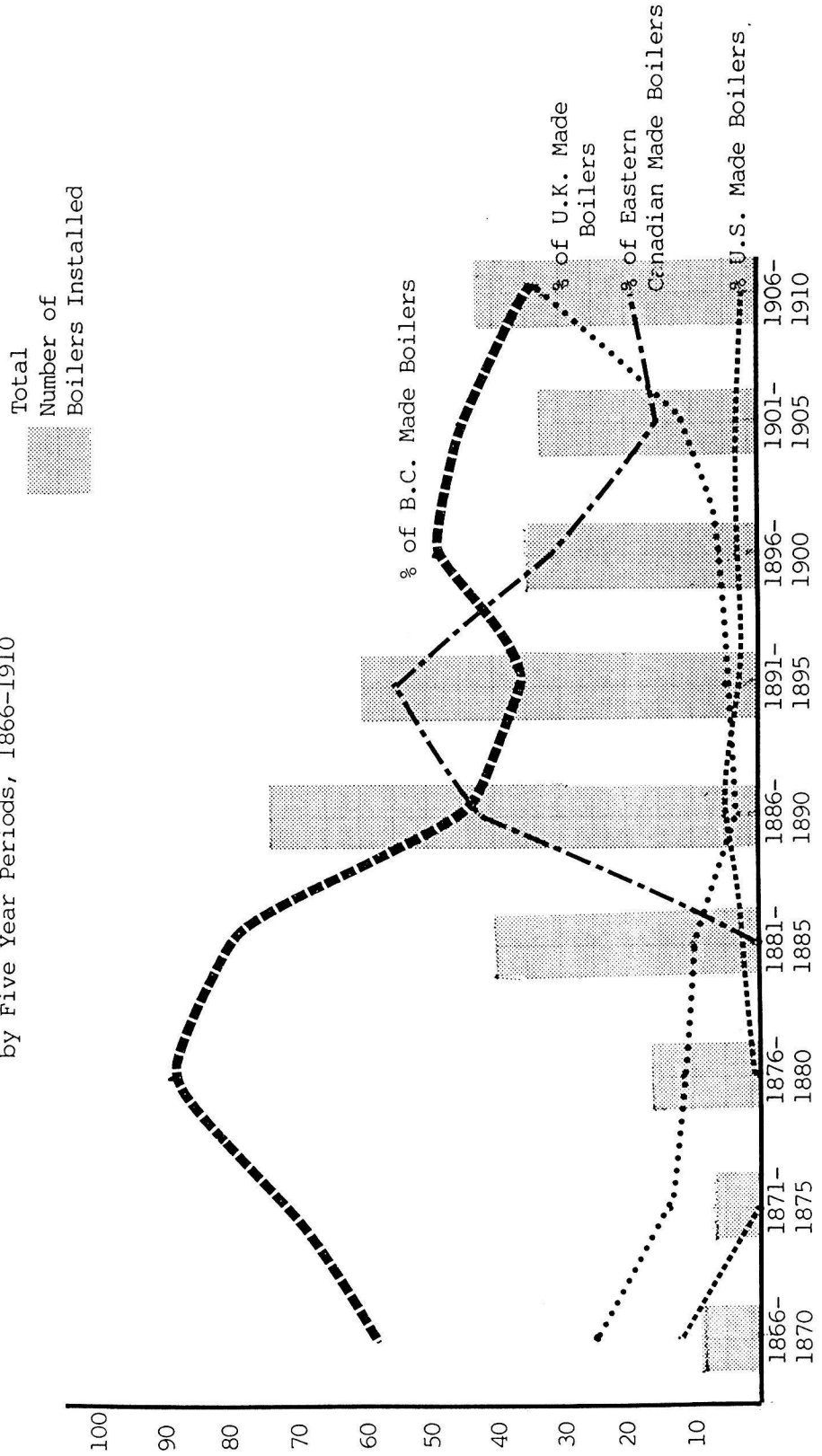
A declining share of the regional market does not necessarily imply declining production if the regional market itself is growing quickly.³⁰⁹ In the case of marine steam boilers, the market actually declined overall in the fifty years under study due partly to the increasing popularity of gas engines, so absolute levels of production in British Columbia did fall. Moreover, the period of the most dramatic growth in the market coincided with no increase in the output of British Columbia built marine engines. (See Figure 6).

The case is slightly different with marine engines as British Columbia firms built both steam and gas engines. There was tremendous growth in the engine market so despite a falling share of the market there was still growth in output of local marine engines until the five years 1906-10 when the market doubled in size while the output from British Columbia firms actually fell in absolute as well as relative terms (See Figures 7, 8). For stationary boilers the market contracted in the six years after 1902,

³⁰⁹ It could be for example, that local manufacturers were unable to "keep up with the demand" and an increasing amount of imports were necessary to supply the local market.

Figure 6

Total Number of Ship Boilers Installed
in B.C. and Market Share by Place of Manufacture
by Five Year Periods, 1866-1910



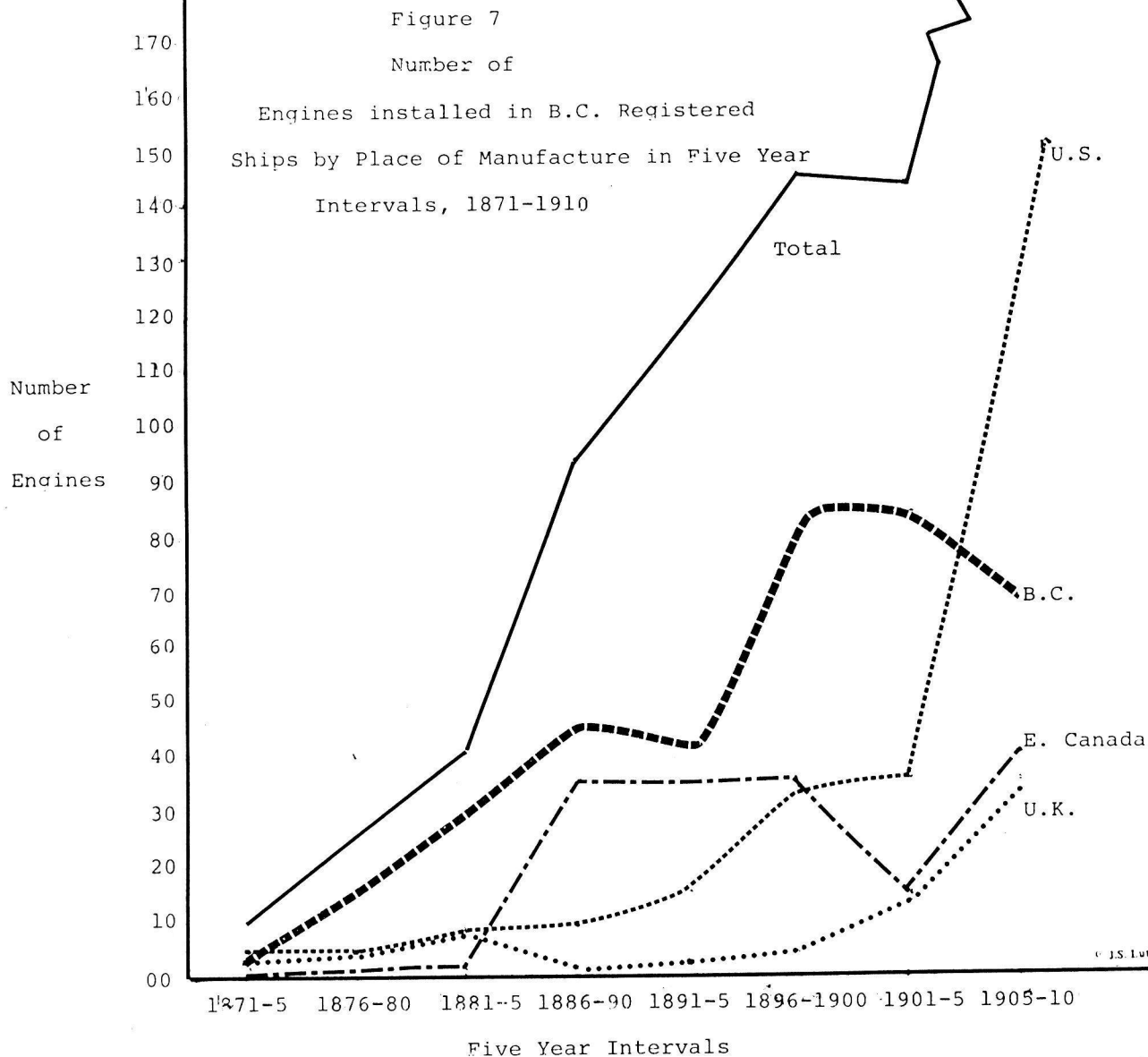
Source: see text.

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expanded from 1908-1912, and then fell off sharply with the depression of 1913. During the 1908-1912 boom however, British Columbia firms did increase their output despite barely holding their own share of the market (see Figures 9 and 10). In summary, British Columbian firms captured a declining share of markets that, in the case of the marine boilers, were not growing, or in the cases of marine engines and land boilers, were not growing fast enough to prevent this from translating into an absolute decline in output. It is also clear in the case of marine engines and stationary boilers, and at the more general level, from Bertram's and Pinchin's indices of regional specialization (see Chapter 5) that the decline of boiler and engine manufacturing in British Columbia was the regional manifestation of a process of integration into a continental and international economy. British Columbia manufactures were being displaced by Eastern Canadian, American and British products.

In all three markets there was a three stage pattern. In the first stage, prior to the arrival of the CPR, British Columbia manufacturers displaced principally American and British manufacturers. In the second stage which lasted from the arrival of CPR in 1886 to nearly 1900 (this happened later with land based boilers) Eastern Canadian, principally Ontario manufacturers displaced British Columbia producers. Ontario manufacturers produced the overwhelming share of boilers and engines from eastern Canada. For example Ontario firms produced 93% of the boilers made in eastern Canada and installed in British Columbia ships. Fifty-two percent of these were produced by a single firm, John Doty and Sons, and a further 25% of the Ontario boilers were produced by Polson Engine Works, both in Toronto.³¹⁰ In the third stage, in the ship engine market, and marine boilers the Ontario firms found themselves forced out of the market by American and British firms, respectively.

³¹⁰ Canada, Board of Steam Ship Inspection Records, PABC.

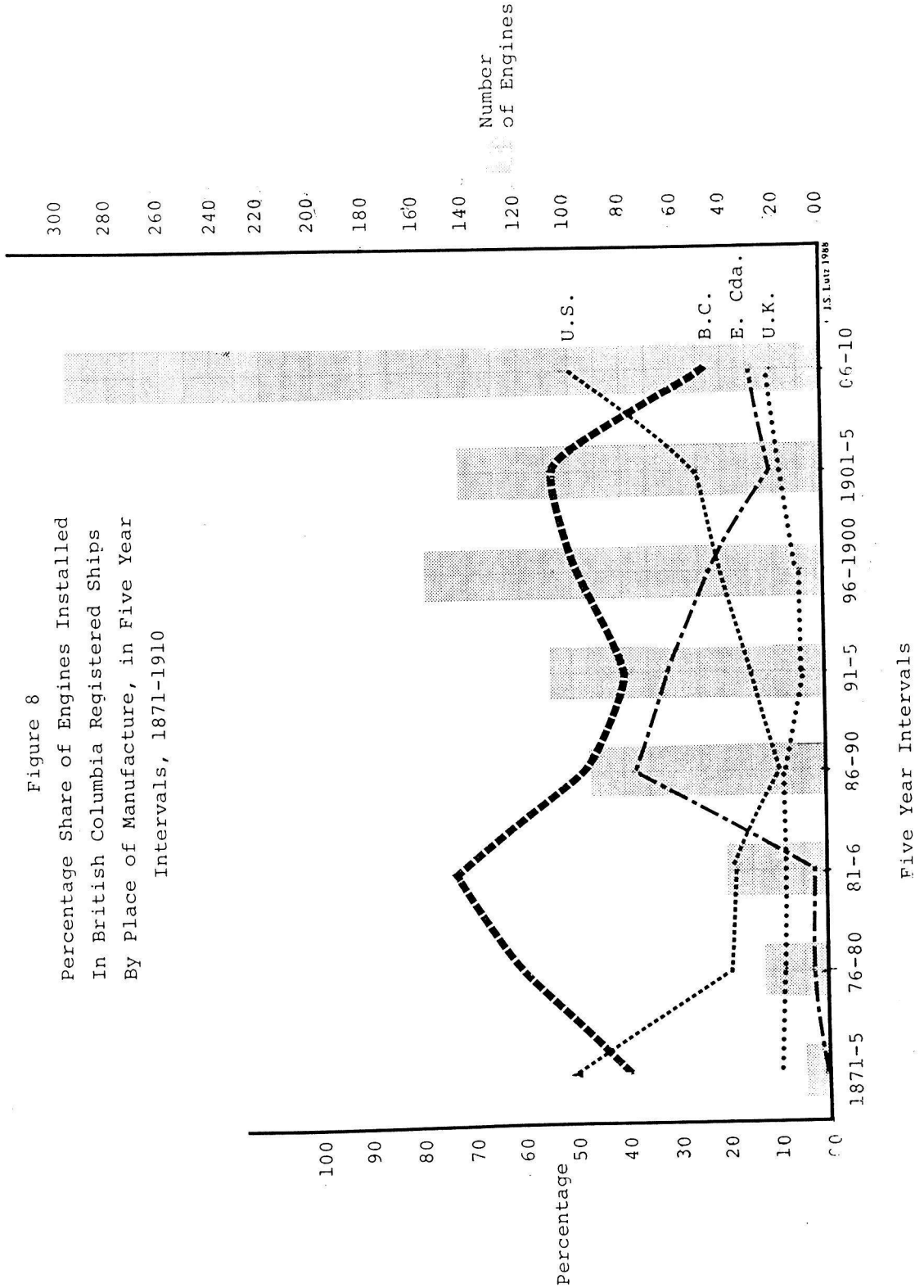


What happened, at least with regard to the market shares of British Columbia manufacturers, is reasonably clear -- at a macro-level. The difficult, and still essentially speculative venture is to identify the mechanisms which underlay the continental integration of markets for boilers, engines and, apparently, other manufactured goods. While in the case of the Atlantic provinces, the debate over the mechanisms is well underway and various hypotheses proposed for this national, international and continental integration, there is little empirical evidence, and no general consensus. With regard to the west coast of Canada, however, this process remains largely unexplored. In the absence of the necessary "spade work," tracing the transfer of manufacturing linkages from one location in space, economic and geographic, remains a hoary problem embedded, as it is, in shifting structural frameworks. As a result, the following attempt to explain the process, illustrated by the boiler and engine industry, should be regarded as an exploratory venture. As such, it focusses primarily on the displacement of British Columbia manufacturers by Ontario firms in the post 1885 era as this was common to all three markets and comparable census data exists for Ontario.

There are two analytical approaches that have dominated the search for an explanation of Canadian economic patterns: the first falls broadly under the rubric of orthodox economics and often cast in an export base framework and the second, the neo-Marxist, "structuralist" or dependency framework. Both have been described in Chapter 2. The third approach, the production system approach, starts with the production function common to both major approaches.

The dependency approach is rarely this explicit but both it and the orthodox approaches converge at a fundamental level. Investment in manufacturing is seen as a result of a calculation based on anticipated profits (or rates of exploitation) compared to those available from alternative investments. In other words if manufacturing in

Figure 8
 Percentage Share of Engines Installed
 In British Columbia Registered Ships
 By Place of Manufacture, in Five Year
 Intervals, 1871-1910



Source: See text.

British Columbia was more profitable than alternative uses of capital then it would have been pursued, if not by local capital, then by imported capital. Profit, expressed as an equation yields:

$$\text{profit} = [(\text{revenue/unit of output}) - (\text{cost/unit of output})]Xn$$

where "n" is the number of units of output and X a recognition that there are economies and diseconomies of scale. If we accept, for the purpose of discussion that firms are small relative to the size of the market³¹¹ then they must sell their products at the fixed market price. As a result differences in levels of profitability must be sought at the different input factor price level because revenue/unit of output will not vary between firms.³¹² A composite cost function, a list of all the costs that go into production (and in this case distribution) of one unit of output:

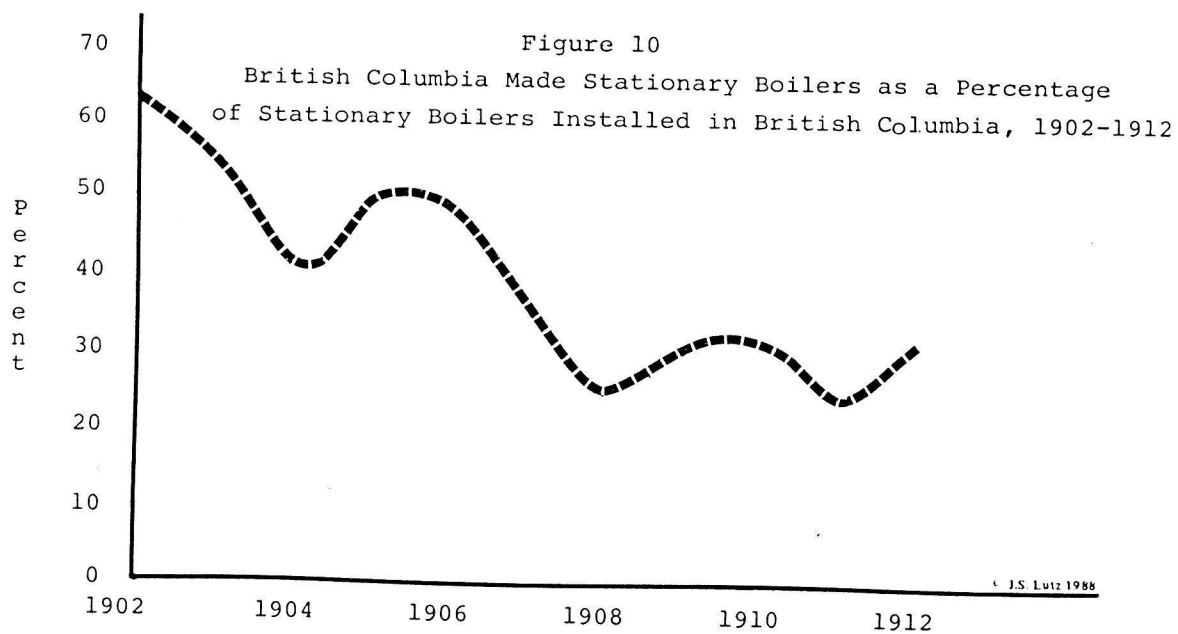
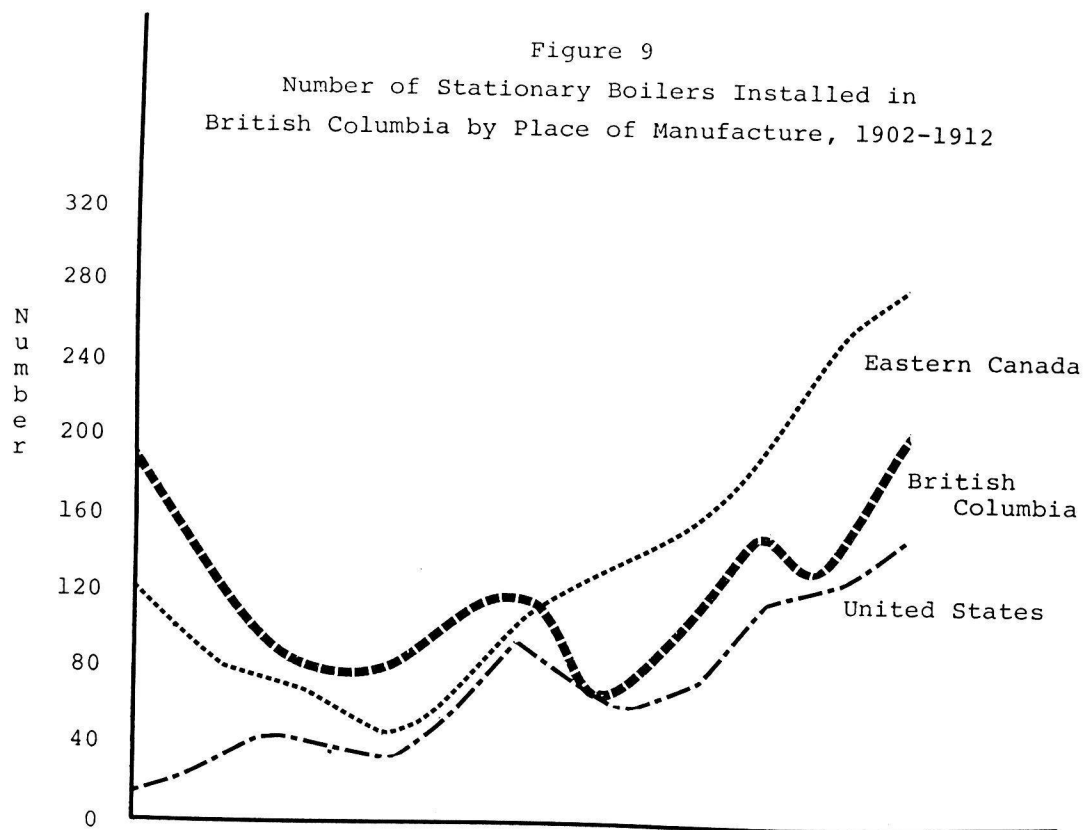
$$\text{Total Cost} = \text{Costs of (Labour, Capital, Material Resources Used, Transportation, Entrepreneurial Talent, Tariffs)}$$

It follows that if eastern firms were able to produce and deliver goods to British Columbia at a lower cost than British Columbia manufacturers could and therefore be more profitable, then the answers as to why ought to be found in an examination of the relative costs of Labour, Capital, Resources, Tariffs, acquiring Entrepreneurial Talent or Transportation, or in the economies of scale/agglomeration economies (Xn).³¹³ Examining the cost and the evolution of the structure of the costs of each of the factors of production should enable one to come to a conclusion as to which were the determining factors in any particular development process, and if the analysis goes deep enough, to explain how these became the determining factors.

³¹¹ This is the case for British Columbia firms relative to the national market after the arrival of the CPR. The assumption doesn't hold when one considers the large national firms but this prejudices the discussion in favour of the orthodox approach. Copithorne, *A Neo-classical Perspective*, p. 1.

³¹² This assumes a homogenous product -- an assumption I considered in more detail below and a consistent level of technology in the capital goods used to produce the product.

³¹³ From a dependency point of view one could argue that "n" is a function of market control, rather than an independent variable.



Source: "Report of the Inspector of Machinery," B.C. Sessional Papers

First then, lets turn our attention to tariffs, taking them respectively, as a dependent variable and briefly examining how the tariff schedule evolved, and as an independent variable and the effect of the cost schedule on individual British Columbia firms. Once British Columbia joined Confederation in 1871, the adoption of the Canadian tariff (which happened in 1872), and the National Policy tariffs in 1879 were unavoidable. But as Clow has argued with respect to the Maritimes, the decision to join Confederation was neither inevitable, nor irreversable.³¹⁴ When British Columbia entered Confederation in 1871 it burst into a new political network with unfamiliar institutions including that queer beast known as "responsible government". While others have recorded that the economic effect of Confederation was not immediately apparent,³¹⁵ the union of B.C. and Canada set in motion the train of events which later produced the National Policy with its sudden and dramatic effect on British Columbia.

The National Policy is frequently cited by the dependency "school" as a primary villain which caused, or at least encouraged the decline of various regional economies.³¹⁶ In this analysis, the National Policy tariff schedule was a product of Ontario and Quebec manufacturers;³¹⁷ there is plenty of evidence that the framers of the national policy intended it to provide markets for central Canadian manufacturers.³¹⁸ Pinchin argues that at an aggregate level there is no disputing the fact that tariff

³¹⁴ Clow, "The Maritime Challenge."

³¹⁵ McDonald, "Economic Development of British Columbia," p. 375; R. Pomfret, *The Economic Development of Canada*, (Metheun, 1981) p. 191.

³¹⁶ Clow, "The Maritime Challenge," p. 130; Acheson, "Empire Canada," pp. 92-5; Inwood considers and rejects this view, "Economic Growth and Structural Change," p. 12.

³¹⁷ In other words, it is a dependent variable; for a summary of some of the approaches to the National Policy, see Dales, "National Policy Myths...". For a recent look at the conjunction of interests between the federal government and the manufacturing interests of Ontario and Quebec, see Ben Forster, *A Conjunction of Interests: Business, Politics, and Tariffs, 1825-1879*, (Toronto: University of Toronto, 1986) pp. 182-200.

³¹⁸ Not least from the lips of Sir John A. Macdonald himself:

I believe that, by a fair readjustment of the tariff... we shall grow up a good, steady and mature trade between the Provinces, rendering us independent of foreign trade, and not, as New Brunswick and Nova Scotia formerly did, look to the United States or England for trade, but to look to Ontario and Quebec, -- sending their products West, and receiving the products of Quebec and Ontario in exchange. Thus the great policy, the National Policy...would be attained.

(House of Commons, *Debates*, 1878, p. 858) and from Sir Charles Tupper:

under the National Policy that Canada has adopted we must look forward not only to building up thriving cen-

policy had the effect of encouraging the centralization of manufacturing in Ontario and penalizing the regional economies.³¹⁹ Melvin has provided a theoretical model which demonstrates that Pinchin's conclusions can be made consistent with neo-classical economic theory.³²⁰

The centralizing effect of the tariff appears to have an empirical basis and theoretical justification in both orthodox and dependency schools. However, when one considers the tariff schedule as an independent variable *vis a vis* the British Columbia boiler and engine industry it is difficult to find an appreciable effect of the tariffs on the de-industrialization process. Clow argues that the tariff had a negative effect on Maritime manufacturing by artificially stimulating uncompetitive industries which were unsuited to the Maritimes and by encouraging over-expansion as regional manufacturers anticipated servicing a national market.³²¹ Whatever merits these hypotheses may have regarding the Maritimes,³²² neither of these problems were faced by British Columbia boiler and engine manufacturers. British Columbia firms often found that they could not keep up with local demand;³²³ this suggests that mis-placed

tries of industry and enterprises all over *this portion of the country*, but to obtaining a market for these industries after they have been established:

(House of Commons *Debates*, April 15, 1880, pp. 1424-5); cited in Craig Brown, "The Nationalism of the National Policy," in D. Francis and D.B. Smith, *Readings in Canadian History, Post Confederation*, (Holt, Rinehart and Winston, 1986) p. 47.

³¹⁹ Pinchin, *Regional Effect of the Tariff*, pp. 1-21, Appendix A.

³²⁰ James R. Melvin, "The Regional Economic Consequences of Tariffs and Domestic Transportation Costs," *Canadian Journal of Economics*, XVIII, 2, (May 1985) pp. 237-257.

³²¹ Clow, "The Maritime Challenge," pp. 128, 131.

³²² Actually Clow doesn't test this hypothesis with evidence but there is some evidence that the national policy did encourage the expansion of Maritime manufacturing or at least retard the centralization process. Inwood, "Economic Growth and Structural Change," p. 12; Peter DeLottinville, "Trouble in the Hives of Industry: The Cotton Industry Comes to Milltown, New Brunswick, 1879-1892," *Historical Papers*, (Montreal, 1980), pp. 100-115.

³²³ Evidence to this effect from the Reports of the Inspectors of Machinery:

The boiler makers of British Columbia have never been so busy as they were during 1902. Contracts and demands for new boilers have been so pressing that they have been compelled to install new and modern tools in their shops in order to cope with the business, and many orders have been placed outside the province because local firms could not promise early delivery.

B.C. Sessional Papers, 1903, p. L11; from the 1906 report:

...there has been an increase in the number of new boilers built during the year over previous years. These have been principally for log hauls, the demand for which class of boiler, owing to the increased market for lumber, taxed the manufacturers to the limit.... In many cases purchasers who would have preferred their boilers built in British Columbia were compelled to import them from Seattle...."

specialization and over-expansion were not problems.

Under the terms of union British Columbia had the right to keep the pre-Confederation tariff schedule until the province was joined to Canada by a railway but the province opted to adopt the Dominion tariff in 1872. Prior to 1872 imported boilers and engines were not specifically named in the tariff schedule and so were charged the 12 1/2% rate. With the adoption of the Dominion tariff the boiler and engine tariffs rose to 15% if the equivalent was being produced in Canada, and free if not (again they were not specifically named and hence fell under the general tariff).

With the adoption of the National Policy Tariffs in 1879 the tariff on all boilers and engines, whether or not they competed with domestic production, rose to 25% and was maintained at this level in the tariff revision of 1898.³²⁴

Before the arrival of the CPR in 1885 the tariff undoubtedly gave British Columbia producers some protection against American and British competition but thereafter they shared the protection with the eastern Canadian firms that were directly responsible for the decline in B.C.'s market share. A brief glance at Figures 6 shows that American boilers were an inconsequential part of the marine boiler market before and after the National Policy tariffs and that while British made boilers were a decreasing share of the market throughout the period of increasing tariffs, their share of the market jumped dramatically after 1896 in spite of the high tariff. Due to the British Preferential Tariff British producers had a slight advantage over American firms in the Canadian market. However, Figures 7 and 8 illustrate that British manufacturers captured a steady 10% of the British Columbia (registered) ship engine market before and after the tariffs. While the share of the U.S. manufacturers fell coincidentally with the rising tariff up to 1890, their share increased thereafter, despite the high tariffs to

B.C., Sessional Papers, 1907, p. K17.

³²⁴ For British Columbia tariffs before Confederation see: Mallandaine's 1871 Victoria Directory, pp. 95-8. For Dominion tariffs see *The Canadian Almanac and Repository of Useful Knowledge for the Year 1873*,

dominate the British Columbia engine market by 1910. To some degree the protection against American competition was ameliorated by preferential freight rates which the Canadian Pacific Railway accorded American shippers.³²⁵ The tariff may have had an adverse affect on British Columbia manufacturers if they had to import materials that eastern producers obtained domestically. Evidence presented below however, suggests that inputs were no more expensive in British Columbia than elsewhere. Thus, though detailed research is lacking the tariff structure seems to not to have caused the decline of the British Columbia boiler and engine industry.

The one aspect of the National Policy which did affect British Columbia immediately was the completion of the Canadian Pacific Railway. From supplying 3% of the ship engines installed in British Columbia in the five years before the completion of the railway, eastern Canadian manufacturers supplied 37% of the British Columbia market in the five years following. Similarly, from no presence in the British Columbia market for ship boilers eastern Canadian producers supplied 45% of ship boilers in the five years after the arrival of the CPR, rising to 55% of the British Columbia market in the period 1891-5. Despite the ongoing debate over whether the national policies had a positive or negative effect on Canadian economic development it is clear that they had an immediate and important effect on British Columbia. The sudden influx of eastern Canadian and American boilers and engines is evidence that the Pacific coast was joining the continental market economy and that the growth of manufacturing in Ontario and the northeastern U.S. was linked to the resource industries of British Columbia.

In the absence of evidence it has been assumed that the sudden Ontario penetration of the British Columbia market (where this was even noticed) was the result of

(Toronto: Copp Clark) pp. 49-50; *ibid.* 1880, p. 69; 1901, p. 73.

³²⁵ See *Reports upon Railway Commissions. Railway Rate Grievances and Regulative Legislation*, in Canada, *Sessional Papers, 1902*, 20A, pp. 70-3; the Board of Railway Commissioners quashed this differential rate in 1906 but the CPR was evidently still giving American shippers preferential rates until at least 1909: Board of Railway Commissioners, Transcripts, National Archives of Canada (NAC) RG 46, vol.11-12, file 542, case 105, (March 23 1906); Vol. 34, (February 23 1909), pp. 3894-5.

the lowered transport cost which resulted from the rail connection. To date, however, how the freight rate structure affected B.C. remains to be fully investigated but this assumption seems problematic. First, assuming that eastern manufacturers had to pay something to the Canadian Pacific Railway to ship goods to the British Columbia market, then, even if the effect of the CPR was to lower the real costs of transportation, eastern manufacturers still had to pay more to ship to coastal British Columbia markets than did British Columbia manufacturers.³²⁶ To overcome this transportation cost difference, eastern manufacturers must have had a previous advantage with respect to one of the remaining factors of production: capital, labour, entrepreneurship or materials. Indeed, the cheaper cost of eastern manufactured goods was evidently a fear of British Columbia businessmen. In 1883, the *Victoria Colonist* newspaper warned:

In the unmistakable revival of business interests, the upward tendency of real estate and the general prosperity throughout the province, the establishment of more manufacturing industries should not be lost sight of....

A beginning must be made now, in order that the first year of struggling may be over before the completion of the CPR - and the consequent leveling of prices down to almost eastern rates which that event will bring about.³²⁷

The question to be answered is why was it cheaper to produce goods in the east?

The second part of the transport relations question is whether or not the CPR actually did reduce the transportation rates for eastern manufacturers to the coast. Evidence is scanty but where it exists it suggests that the CPR set its intercontinental freight rates so as to be competitive with existing ocean freight rates.³²⁸ The

³²⁶ Assuming for the moment that the total British Columbia market was located on the coast, an assumption which is essentially accurate until the 1890's.

³²⁷ Editorial in the *Daily British Colonist*, (February 1883) cited in the *Resources of British Columbia*, (March 1, 1883), I, N. 1, p. 8.

³²⁸ In the judgement of the Commissioner of the Inquiry into freight rate discrimination, S.J. McLean: "The tariffs on transcontinental shipments are based on assumed operation of ocean competition in regards to all lines of shipments." McLean notes that some ocean rates were so low the railway cannot meet the competition. *Reports upon Railway Commissions, Railway Rate Grievances and Regulative Legislation*, in Canada, *Sessional Papers, 1902*, 20A, pp. 70-1; The CPR acknowledged that its rates to B.C. coastal points were set to just meet ocean competition in their response "Responses of the CPR to Grievances submitted by S.J. McLean, Commissioner of Railway Rate Grievances" dated Montreal December 2, 1901 and signed by G.M. Bosworth,

completion of the CPR likely reduced the real cost of transportation to the coast from eastern Canada, not by lowering the dollar/pound cost of shipping but rather by reducing the amount of "turnaround" time of orders and capital as well as the cost of servicing the western market with sales representatives.³²⁹ The CPR apparently caused capital and labour in British Columbia and eastern Canada to change their economic horizons or "planning space". Suddenly, the Pacific coast was closer to Canada, in terms of the time it took a sales agent to travel, the time it took for orders to be received and goods delivered. This is particularly important in the case of boilers and engines where a large percentage were custom ordered. John Weaver records that Hamilton manufacturers quickly seized the opportunity provided and "formed national sales networks as swiftly as the CPR laid track."³³⁰

A third aspect of the question examines how the transportation rates, particularly to the interior of British Columbia and the western prairie markets, the "natural hinterland" of Vancouver, were set. Until the early 1900's the principal market between Winnipeg and Vancouver was the Kootenay district of British Columbia and thereafter, the prairie west. British Columbia was geographically situated much closer to both of these markets than the southern Ontario manufacturers but was excluded

as well as in a letter from W.R. McInnes, Freight Traffic Manager to F.W. Peters, Assistant Traffic Manager, dated 17 February 1903, and cited in Board of Railway Commissioners, Transcripts, RG 46, vol. 10, (March 6, 1906) p. 4173; Canada, Department of Railways and Canals, Office of the Commissioner on Railway Rate Grievances, in NAC, RG 43, "Evidence".

³²⁹ "In the case of shipments by water, there is the question of the time taken up in transportation, and in the interest on capital locked up in the shipments, as well as the cost of insurance. All these tend on certain lines to give the railways an advantage in competition." S.J. McLean, *Reports upon Railway Commissions, Railway Rate Grievances...* p. 71.

³³⁰ John C. Weaver, "The Location of Manufacturing Enterprises: the case of Hamilton's Attraction of Foundries, 1830-1890," *Critical Issues in the History of Canadian Science, Technology and Medicine*, ed. Richard A. Jarrell & Arnold E. Ross, (Tornhill & Ottawa: HSTC Publications, 1983), 197-217; The early prominence of eastern Canadian branch and sales offices has been noted by I.E. Robertson, "The Business Community and the Development of Victoria, 1858-1900," M.A. Thesis, University of Victoria, 1981, and Norbert MacDonald, "The Canadian Pacific Railway and Vancouver's Development to 1900," in W.P. Ward and R.A.J. McDonald, eds. *British Columbia: Historical Readings*, (Vancouver: Douglas and McIntyre, 1981); R.A.J. McDonald, "City Building in the Canadian West. A Case study of the Economic Growth in Early Vancouver, 1886-1893," *B.C. Studies*, No. 43, (Autumn 1979) p. 26; the prominence of eastern firms is also noted in Vancouver Board of Trade *Annual Report*, 1892, p.22. This phenomena has been studied in the Maritimes by L.D. McCann, "Metropolitanism and Branch Businesses in the Maritimes, 1881-1931," in P.A. Buckner and David Frank, *Atlantic Canada After Confederation*, (Acadiensis: Fredrickton, 1985) pp. 202-215.

by a transportation rate schedule that operated self-consciously in the favour of eastern manufacturers. B.C. manufacturers and Boards of Trade were constantly giving evidence before the Railway Commissioners that the CPR's freight rates shut them out of the prairie and Kootenay markets.³³¹ On one such occasion the Vancouver Board of Trade complained that:

a number of industries had planned to commence operations in and around Vancouver but that after careful study of western rates compared to eastern rates the promoters reluctantly agreed that the discrimination in favour of the eastern manufacturers was so prohibitive that they considered it premature to commence operations until the rates had been fairly adjusted.³³²

That the Canadian Pacific Railway appreciated its role in the National Policy and that it lacked concern for British Columbia manufacturers relative to eastern Canadian manufacturers was made clear in one of their submissions to the Board of Railway Commissioners:

Manufacturing industries in Eastern Canada already feel the effect of competition on similar goods which are brought from Europe by water to Vancouver, and marketed in British Columbia interior points and Alberta. Any reduction in the rates from Vancouver to points eastward thereof, would, of course, increase this competition, much to detriment of Eastern Canadian manufacturers who are now serving that market.³³³

The rate structure worked against British Columbia manufacturers in a variety of ways. The average freight rate per mile of railway track from 1901-1914, was twice as expensive on the CPR between Vancouver and Canmore Alberta, than it was to ship over any other mile of CPR track.³³⁴ The effect, of course, was to move the point where the railway rates for westbound goods met the rate for eastbound goods, westward into British Columbia and thereby limit the market of B.C. producers. For

³³¹ See for example the complaints by the B.C. Box Factory, and the Victoria Based British American Paint Company, August 1901; Wholesalers had the same complaints: see F. Buscombe, Crockery Wholesaler and W.H. Malkin, grocery wholesaler, in RG 43, "Evidence," pp. 231, 243, 245 & ff.

³³² Board of Railway Commissioners, vol. 41, file 96, (27 March 1909) p. 14537.

³³³ Board of Railway Commissioners of Canada, Transcripts from hearing March 6, 1906; NAC, RG 46, v10, p. 484.

³³⁴ The CPR justified this on the grounds that it was more expensive to build the railway in British Columbia and that maintenance costs were higher. H.W. Hewetson, "The Railway Rates Problems of Western Canada with Special Reference to British Columbia," M.A. Thesis, University of B.C., 1925, Hewetson, "The Railway Rates Problem," p. 65.

example, in 1901 rates from Winnipeg met the rates from Vancouver, at Golden, B.C., a distance of 1,007 miles from Winnipeg but only 475 miles from Vancouver. This effectively shut B.C. producers out of the Kootenay market.³³⁵ *Moody's Magazine* noted in 1913 that the freight rate structure was a particular handicap to British Columbia Iron and Steel Fabricators.³³⁶

To add insult to what was already causing considerable injury cross-country rates blatantly favoured the east over the west. Evidence presented to the Board of Railway Commissioners in 1909 illustrated the problem. Taking an average of all the class rates 1-4³³⁷ it was 12.64% cheaper to ship any item from Toronto to Vancouver than it was to send it from Vancouver to Toronto and 20.15% cheaper to ship from St. John to Vancouver than it was to send it back.³³⁸ Foundries from as far away as Nova Scotia were competing in British Columbia with local producers.³³⁹

Beyond the published rate structures there were also other kinds of "hidden discrimination". Eastern manufacturers had the option to ship "full carloads" at the reduced rate for full cars and then break up the carload at various way stations. British Columbia manufacturers complained that they were unable to get a "full car" rate unless the full carload was going to a single destination, which was only possible for very bulky goods given the smallness of the interior communities. Eastern manufacturers taking advantage of this situation could ship boilers to the Kootenays more cheaply than a boiler could be shipped from Vancouver.³⁴⁰ The intent of the Canadian

³³⁵ "Evidence - Meetings With the Boards of Trade" (August 30 1901) p. 247.

³³⁶ W. Martin Swift, "Industrial Future of British Columbia," *Moody's Magazine*, 15, 6 (Special Canadian No. June 1913), pp. 483-490.

³³⁷ Most small to mid size manufacturers would have to use the class rates, rather than the bulk commodity rates, in shipping their products.

³³⁸ Vancouver rates apply equally to all coastal terminal points including Victoria, New Westminster, and, until 1915, Nanaimo. See: Board of Railway Commissioners of Canada, Transcripts of Hearings, in NAC RG46, vol. 46, file 1922, October 27, 1909, p. 14537ff.

³³⁹ L.D. McCann, "Mercantile Industrial Transition and the Metal Mining Towns of Pictou County, 1857-1931," *Acadiensis*, vol. X, No. 2, p. 53.

³⁴⁰ "Evidence - Meetings With the Boards of Trade" (August 30 1901) p. 247; Letter from the Nelson

Pacific Railway was frankly stated in a letter sent to the Vancouver Board of Trade: "We want to carry goods 3000 miles if we can rather than 200 or 500 miles."³⁴¹

One of the arguments frequently used to explain British Columbia's failure to sustain a secondary manufacturing sector is that the market was too limited.³⁴² There are two problems with this line of argument. First it does not address why British Columbia manufacturers were unable to service even the local market. Second, the British Columbia coastal manufacturers were geographically much closer to the expanding prairie west than their Ontario competitors. 1900-1910 was the decade of the wheat boom which some have regarded as the engine of Canadian growth and one of the primary causes of the westward movement of Canadian manufacturing from the Maritimes to Ontario.³⁴³

The small but growing literature on transport rates in Canada has a common thread. Canadian transport rates were not based exclusively on geographic or technical considerations but are the result of "a complex of socio-cultural factors."³⁴⁴ Limitations on the size of the market open to British Columbia manufacturers were a result, not of geography, but of a broader set of "transport relations" which included a discriminatory freight rate structure.

Board of Trade, 7 September 1901, in RG 43, "Evidence"; Board of Railway Commissioners, Transcripts, RG 46, vol. 8, (Sept. 19, 1905) p. 3325;

³⁴¹ Cited in hearings before the Board of Railway Commissioners of Canada, Mar. 6, 1906 in NAC, RG 46; v. 10, p. 465.

³⁴² Allen, "B.C. Past, Present and Future," pp. 31-2; Shearer, "The Economy of British Columbia." McCann, "Urban Growth in a Staple Economy," McDonald, "Economic Development of B.C.," p. 379; Fred W. Field, *Capital Investment in Canada*, 3rd ed., (Montreal, 1914) pp. 134-5. This argument relies on the existence of economies of scale which a single firm servicing a regional market cannot achieve. The available evidence gives no indications of significant economies of scale, nor estimates of how significant scale economies might potentially be. The possibilities for economies of scale are discussed below.

³⁴³ Clow, "The Maritime Challenge," pp. 117,135; Inwood, "Economic Growth and Structural Change," p. 22; Moreover, the upturn in Canadian economic activity in 1896 generally attributed to the wheat boom, was, until 1901 a product of the Klondike, which British Columbia was ideally situated to capitalize on. Pomfret, *Economic Development of Canada*, p. 157.

³⁴⁴ Wood, "Marxism and the Maritimes," p. 27; Hewetson, "The Railway Rates Problem.," T.D. Regehr, "Western Canada and the Burden of National Transportation Policies," *Canada and the Burden of Unity*, pp. 115-142; Forbes, "Misguided Symmetry."

Taking the CPR as a transportation service only, the conclusions we can reach are limited to the following: first, taking the rate structure as an independent variable, the CPR apparently did not substantially lower transportation costs to the B.C. coast, and certainly left eastern manufacturers to pay some freight costs on top of their production costs, to compete in the B.C. markets. However, the CPR did psychologically integrate British Columbia into the continental commodity or product market and as a result, local manufacturers felt the direct and keen competition of eastern goods. It did drastically reduce the amount of time it took to deliver eastern products to British Columbia. Finally, while not lowering costs to the coastal points the railway freight structures were a product of a set of transport relationships which set up freight rate barriers which penalized B.C. manufacturers *vis a vis* manufacturers from Winnipeg eastward, thereby limiting the interior market available to British Columbia manufacturers. Taking these conclusions together it is clear that it is not enough to know the relative transportation costs facing regional and non-regional producers. Rather, to use freight rates as an explanation of regional decline we have to understand how they were set.

Yet, if the CPR gave eastern manufacturers an advantage in serving the interior markets it did not account for their success in the coastal markets where eastern-built engines and boilers were being installed within earshot of British Columbia manufacturies. There must have been a cost advantage in some other combination of inputs. In Faucher & Lamontagne's comparison of the manufacturing sectors of Ontario and Quebec the crucial factor was material inputs, particularly coal and iron.³⁴⁶ The available

³⁴⁵ * This figure seems to be the result of a reporting anomaly. Only one firm was enumerated in this category in 1890-1, presumably Albion Iron Works, and the figures reported are only a fraction of the figures reported in Albion's Financial Statements. Apparently a part of Albion's production was allocated to the boiler and engine category -- and the roughness of the estimate is suggested by the fact that only in this year were the figures for production, wages etc. rounded to the nearest \$1,000. Source: Canada Census 1881, Vol. III; 1891, Vol. III; 1901, Vol. III; 1911, Vol. III; Albion Iron Works, Financial Statements, PABC.

³⁴⁶ Faucher and Lamontagne, "Industrial Development;" Inwood argues that this is one factor explaining slow Maritime industrial growth. This approach has been attacked by Altman, "Resource Endowments;" and Kerr and Weaver both argue that market orientation is more important than material orientation in the case

Table 17
Material Costs as a Percentage of Output Costs of Boiler and Engine
Industry, the Census Years 1880-1910³⁴⁵

	B.C.	Ontario	Canada
1880-1	34.9	56.0	49.1
1890-1	66.7*	33.7	45.8
1900	27.3	38.4	38.6
1910	35.1	39.4	36.1

data permits two methods of checking the importance of cost advantages of cheaper material inputs. Table 17 shows the value of all materials consumed in the boiler and engine industry to produce one dollar of output. Assuming that the outputs are identical, a lower value implies cheaper materials. It is clear that over the four censuses for which data is available, with one exception, British Columbia manufacturers had cheaper access to inputs.³⁴⁷ How British Columbia producers were able to obtain their main input, steel, cheaper than their eastern competitors is surprising due to the fact that no steel was made in western Canada. The limited available evidence suggests that British Columbia producers were buying most of their materials from Britain and there is some evidence to suggest that British steel was much cheaper in this period than American steel.³⁴⁸ The relative costs of steel for eastern and western boiler and

of the secondary iron and steel industry. Kerr, "Geography of the Iron and Steel Industry;" Weaver, "The Location of Manufacturing Enterprises;" Inwood, "Economic Growth and Structural Change," p. 21.

³⁴⁷ The exceptional year appears to be the result of a reporting anomaly. See source note for Table 17. The assumption of identical units of output is not far off the mark given that the registration data shows that British Columbia manufacturers could produce any of the types of engines imported. However, below I waive this assumption when examining the effect of technological lag.

³⁴⁸ James H. Hamilton, *Western Shores*, (Progress: Vancouver, 1932) p. 156. Corporation of the City of Victoria, *Victoria Illustrated*, (Ellis: Victoria B.C., 1891) p. 81.

engine makers requires further study.

Altman and Faucher & Lamontagne consider that for the iron and steel industry, the price of fuel is a crucial part of material cost. Table 18 allows a comparison of the percent of total output that is accounted for by fuel costs in B.C. compared to the rest of Canada in 1900 and 1910. In 1900 B.C. fuel costs were considerably cheaper than those in the rest of Canada and in 1910, slightly more expensive, relative to output. The difference however is trivial compared with the spread between other factor input prices. Material costs did not work to the disadvantage of British Columbia boiler and engine makers and may have in fact worked to their advantage.

Table 18
Power Costs in Current Dollars and as a Percentage of Output Costs of
Boiler and Engine Industry for 1900 and 1910³⁴⁹

	Foreign Coal \$	Canadian Coal \$	Other Fuel \$	Total Fuel \$	Share of Total Output
1900					
B.C.	-	-	-	8,270	2.2
Ontario	-	-	-	45,762	1.8
Canada	-	-	-	100,485	2.1
1910					
B.C.	-	892	8,400	9,292	1.5
Ontario	75,000	-	21,234	96,234	2.0
Canada	86,706	72,411	61,028	220,145	1.9

³⁴⁹ Source: *Canada Census 1901*, Vol. III, Table IV; *Canada Census 1911*, Vol. III, Table IV.

The boiler and engine data is less directly useful when it comes to evaluating the relative costs of capital inputs in British Columbia compared to the rest of Canada but it does allow us to narrow the questions. Some writers have seen the size and structure of the capital market as an obstacle to regional development or the actual cause of de-industrialization. It has been argued with respect to the Maritimes that small firm size, in small urban centres, meant that capital investment was riskier than in larger firms in larger centres hence capital was more expensive.³⁵⁰ Others suggest that the centralized nature of the banking system meant that capital was available at better terms to central Canadian capitalists;³⁵¹ that eastern Canadian firms organized capital more effectively by using different corporate structures;³⁵² or that the physical location of the ownership of capital outside the region where it is employed has disadvantageous effects on that region.³⁵³ Unfortunately, we still know very little about the structure of the capital market in British Columbia before or after the railway.³⁵⁴

Returning to our original formulation, that capital responds to the highest anticipated profits relative to other opportunities, it follows that if boiler and engine production was more profitable in Ontario than in British Columbia, then that is where investment capital would flow. Table 6 illustrates the return to investment in the

³⁵⁰ Inwood, "Economic Growth and Structural Change," pp. 22-4.

³⁵¹ Acheson, "Empire Canada," p. 95.

³⁵² Inwood suggests this is quite possible but evidence is lacking, "Economic Growth and Cultural Change," p. 18; D.M. Thornton, "Victoria's Relative Economic Decline: The Case of the Albion Iron Works: 1862-1910," unpublished Honours Paper, University of Victoria, 1984, p. 25.

³⁵³ Acheson, "National Policy," and "Empire Canada," Marchak, *Green Gold*, pp. 24-5. Allen "B.C. Past, Present and Future," admits this is possible but argues that evidence is missing; Copithorne demonstrates that this is theoretically compatible with the orthodox approach in L.W. Copithorne, *A Neoclassical Perspective on Natural Resource-Led Regional Economic Growth*, (Ottawa: Economic Council of Canada, 1977) Discussion Paper No. 92, pp. 18-20.

³⁵⁴ Writings that address British Columbia capital market include: Donald G. Patterson, *British Direct Investment in Canada 1890-1914: Estimates and Determinants*, (Toronto: University of Toronto, 1976) and D.G. Patterson, "European Financial Capital and British Columbia: An Essay on the Role of the Regional Entrepreneur," *B.C. Studies*, 21, (Spring 1974), pp. 33-47. Peter Baskerville, "Financial Capital and the Municipal State: The Case of Victoria, British Columbia, 1910-1936," *Studies in Political Economy*, 21, (Autumn 1986) pp. 83-106; Victor Ross, *The Story of the Imperial Bank of Commerce*, (Toronto: Oxford University, 1921).

boiler and engine making industry in British Columbia, Ontario and Canada.³⁵⁵ This admittedly crude measurement of profitability suggests that in the first 30 years of this study period, rates of profit in Ontario exceeded those in British Columbia but in 1910, while lagging behind the Canadian average, the profits of British Columbia producers exceeded those of Ontario. The consistently lower profit rates from 1880-1900 suggest why capital may have been flowing to boiler and engine making outside of British Columbia, but of course, this begs the question of why profits were lower.

Could low profitability have resulted from the British Columbia boiler and engine industry being undercapitalized? Unfortunately, the aggregate boiler and engine data is

Table 19
Profit or Return to Capital for the Boiler and Engine
Industry for the Census Years 1880-1911³⁵⁶

	B.C.	Ontario	Canada
1880-1	.141	.211	.285
1890-1	.529*	.592	.342
1900	.098	.171	.154
1910	.237	.115	.253

³⁵⁵ This method of measurement of profitability (rate of exploitation) has been used by Inwood ("Economic Growth and Structural Change") writing in orthodox school and Wood ("Marxism and the Maritimes") writing from a Marxist approach. It expresses the residual value when the cost of wages and productive salaries, materials consumed, and depreciation are subtracted from the total value of output as a ratio of total capital investment.

³⁵⁶ * This figure seems to be the result of a reporting anomaly. See Table 17 for explanation.

Return to Capital = $\frac{[\text{Output} - (\text{Wages} + \text{Material Costs}) - \text{Depreciation}]}{\text{capital invested}}$

Depreciation is estimated at 5% per Inwood and Wood and salaries are included with wages. Inwood, "Economic Growth and Structural Change," and Wood, "Marxism and the Maritimes;" Source: Canada Census 1881, Vol. III, 1891, Vol. III, 1901, Vol. III, 1911, Vol. III.

not very informative in this regard³⁵⁷ but the minute books and financial records of the Albion Iron Works are of some assistance.³⁵⁸

The cost of, and ability to attract capital into the production process in developing regions has become a central part of the debate over Maritime de-industrialization.³⁵⁹ In the pre-railway period the local commission agents supplied the bulk of the capital required in British Columbia. This was supplemented by the Bank of British Columbia which, though owned in Britain, had considerable local autonomy and was closely connected to the Victoria agents. These agents provided the capital which financed and controlled the salmon canning industry up to 1902 and they also conducted the sales to British markets.³⁶⁰ Local capitalists started the first successful export mill with financing by the local commission agents. Again the Victoria-based commission agents acted as exporters for the main sawmills in British Columbia up to the 1890's.³⁶¹ These same agents invested heavily in and dominated the sealing industry which was conducted out of Victoria.³⁶² Many of them were shareholders, incidentally, in Albion Iron Works.

Beyond the dramatic and visible effect of linking the Pacific coast of Canada directly into the continental "product market" the completion of the Canadian Pacific

³⁵⁷ Inwood appears to argue that Maritime manufacturing was under-capitalized, the result being an inability to reap economies of scale. Below I consider the question of economies of scale separately. See Inwood, "Economic Growth and Structural Change," pp. 24-6. In terms of average capital investment per firm, British Columbia firms were smaller than Ontario's and the Canadian average in the census years 1880, 1890, but twice as large in 1900. With the failure of the largest manufacturer, Albion Iron Works, the average size plummeted again for the 1910 census. The snapshot measure of profitability shown in Table 6 will always show an inverse relationship between profits and capital investment.

³⁵⁸ Financial Statements Albion Iron Works, PABC.

³⁵⁹ For example see: Acheson, "National Policy," and "Empire Canada;" Frost, "The *Nationalization* of the Bank of Nova Scotia, 1880-1910"; Inwood, "Economic Growth and Structural Change," pp. 24-6.

³⁶⁰ David J. Reid, "Company Mergers in the Fraser River Salmon Canning Industry, 1885-1902," *Canadian Historical Review*, LVI (1975), pp. 282-302; H.K. Ralston, "Patterns of Trade and Investment on the Pacific Coast 1867-1892: The Case of the British Columbia Salmon Packing Industry," *Historical Essays on British Columbia*, in J. Friesen and H.K. Ralston, ed. (Toronto: McClelland and Stewart, 1976) pp. 167-176.

³⁶¹ J.C. Lawrence, "Markets and Capital: A History of the Lumber Industry of British Columbia 1778-1952, Masters Thesis, University of British Columbia, 1951, p. 22-6.

³⁶² D.G. Patterson and J. Wilen, "Depletion and Diplomacy: The North Pacific Seal Hunt, 1886-1910"

Railway prompted an integration of capital markets. Eastern Canadian banks started to establish branches and purchase existing locally based banks.³⁶³ Suddenly locals had to borrow money from these non-local suppliers of capital.³⁶⁴ The Albion Iron Works case lends some support to the hypothesis that the amalgamation of local banks into the central banking structure made capital more expensive (more difficult to raise) for regional firms. One of the main shareholders of Albion, W.C. Ward, was also the manager of the Victoria branch of the Bank of British Columbia.³⁶⁵ Albion used the Bank of British Columbia for its short term borrowing needs and regularly ran up overdrafts to \$80,000 without putting up collateral. When the administration of the bank was taken over by the Bank of Commerce in 1901, Albion's overdraft privileges were cancelled and the inability of shareholders to pay off this debt was one of the causes of the firm's collapse.³⁶⁶

Of course, the takeover of the Bank of B.C. by the eastern Bank of Commerce coincided with Albion's financial woes and labour difficulties. The problem becomes one of identifying the causal factors. Did Albion fail because it was unable to raise capital or was it unable to raise capital because it was failing due to other factors in the production relationship?

The Albion case also suggests the importance of the structure and location of ownership of the firm. After 1885, eastern Canadian and American firms, the most important of these being the Canadian Pacific Railway itself, began making large scale

Research in Economic History, Vol. 2, pp. 81-139; Peter Baskerville, *Beyond the Island*, pp. 50-2.

³⁶³ Within one year of the first transcontinental train crossing the country the Bank of Montreal had opened its first branch in British Columbia in Vancouver. In 1893 Victoria's largest private bank closed. In 1895 the Imperial Bank of Canada established a Vancouver branch, followed in 1898 by the Canadian Bank of Commerce, Molson's bank and the Merchants Bank of Halifax. The Bank of B.C. was purchased by the Bank of Commerce in 1901. The Dominion Bank opened its first office in British Columbia in 1907; McDonald, "Economic Development of British Columbia," p. 384-6.

³⁶⁴ McDonald, *ibid.*, Reid, "Company Mergers," p. 323.

³⁶⁵ Though the Bank of British Columbia was owned by British capitalists it operated with considerable local autonomy. See Ross, *History of the Canadian Imperial Bank of Commerce*.

³⁶⁶ "Rough Draft of the Proposed Policy for Albion Iron Works," (February 21, 1903) O'Reilly Papers and Minute Books, Albion Iron Works, 1901-1904, PABC.

investments in British Columbia where previously the major investors had been either local capitalists or British portfolio investors. The financial structure of the railroads and their associated subsidiaries differed from the earlier pattern of local ownership of interlocking partnerships financed largely by chattel mortgages. These new firms were vertically and horizontally integrated corporations and their wholly owned subsidiaries. Although the British Columbia capitalists had been using the corporate structure to raise capital since the re-financing of Albion in 1883, they had remained in a state of "nepotic corporativism". Shares in Albion were traded privately and the owners never relinquished control to professional management. Since most of the directors of Albion were also customers or suppliers, business dealings were sometimes at the expense of Albion in favour of their other interests. Further, the failure to pass management onto a professional manager, separate from the owners meant that the firm had difficulty surviving the loss of the dynamic owners who had provided direction.³⁶⁷

Yet, while there may have been other contributing factors, the boiler and engine data reveal what is probably the most important effect of an invasion of non-local capital on a regional economy and one that is not much discussed in the literature. The purchasing patterns of non-locally owned firms differed from those owned in British Columbia. Where the linkages from the resource and transportation sectors to the manufacturing sector would be located was a function, at least in part, of where the former were owned. From the two sets of data which allow the linkage between purchaser and supplier, the ship engine and the ship boiler records, it is clear that local capitalists and locally owned firms had a greater tendency than non-locals (not living or based in British Columbia) to buy their ships from local shipyards. Moreover, of the ships built in B.C. for local and non-local owners, the former tended to purchase

³⁶⁷ The involvement of the owners in the daily affairs of the business is evident in: Minute Books, Albion Iron Works, PABC. Jeremy Atask, "Industrial Structure and the Emergence of the Modern Industrial Corporation," *Explorations in Economic History*, 22, 1, (January 1985) pp. 1-28;

the machinery for the vessels locally while the latter tended to import them.³⁶⁸ Three examples suggest the broader pattern.

The first two examples involve the purchase of locally owned shipping companies by the eastern based Canadian Pacific Railway and clearly illustrate the changing purchasing patterns which accompany changing ownership. The first case involves the Columbia and Kootenay Steamship Navigation Company (C&KSNC) which was formed in 1889 by British Columbia capitalists, J.A. Mara, F.S. Barnard and John Irving to provide steamship services on the Upper Columbia to connect with the CPR at Revelstoke. Eventually the company connected all the railway terminuses on the Columbia and Kootenay chain of rivers and lakes. In 1887, in order to gain control over the shipment of ore and the water connections of its competitors, the CPR purchased the C&KSNC.³⁶⁹ Of the twelve vessels that had been built for the locally owned C&KSNC all were built in British Columbia. Of these vessels, eight had new engines installed while owned by the company, and half of these were supplied by British Columbia firms. Of the eight boilers for which records exist, half were locally made. In contrast, one third of the CPR's 28 vessel lake fleet, which was the successor to the C&KSNC, were built in eastern Canada. Of the 10 ships built in British Columbia for which we have engine data, only 30% used engines made in British Columbia, with the ratio for boilers running very similar.³⁷⁰

More dramatic even was the 1901 takeover of the locally owned Canadian Pacific Navigation Company (CPN) by the Canadian Pacific Railway. Of the seven vessels in the CPN fleet, six were built locally. All used locally made engines and boilers, which

³⁶⁸ The data base is quite rich and when fully computerized will permit precise statistical measures.

³⁶⁹ The editor of the *B.C. Mining Record*, (April 1897) remarked that:

...since the CPR took over the boats of the C & KSNC boats will hereafter be run purely in the interests of the CPR system.

³⁷⁰ Sources: R.D. Turner, *Sternwheelers and Steam Tugs, An Illustrated History of Canadian Pacific Railway's British Columbia Lake and River Service*, (Victoria: Sono Nis, 1984) Appendix I and Ship Registers, Ports of Victoria, Vancouver and New Westminster, and Steamboat Inspector Reports, PABC GR806.

is not surprising given that several of the principals in the firm also held shares in the Victoria Albion Iron Works. After the CPN was purchased by the CPR only six of the 16 new ships added to the fleet before 1915 were built locally and all of these used engines built in eastern Canada or Great Britain.³⁷¹

The third example is the Union Steamship Company. Established in Vancouver in 1889 but financed by capital largely from Glasgow, this company purchased all of its new vessels, engines and boilers from Scottish and primarily Glasgow shipyards. Nor are these isolated examples. The CPR alone owned 13.4% of the tonnage registered in British Columbia between 1867-1914, and a quarter of all of the iron/steel hull tonnage. Other steamship companies, predominantly non locally owned, by the end of the period owned 28% of all tonnage and over a third of the iron/steel hulled tonnage.³⁷² Eastern Canadian owners steadily increased their ownership of the B.C. shipping industry from the 1880's onward and accounted for nearly one fourth of the new direct investment in shipping in B.C. by 1910-14.³⁷³

Non-local ownership was increasingly prevalent in all sectors of the British Columbia economy, not just the water transportation sector. In 1905 the CPR bought out the locally owned Esquimalt and Nanaimo Railway and Steamship Line on Vancouver Island and from the 1890's on had been busy buying railways in the Kootenays and southern B.C. The CPR also bought interests in mines and by 1898 controlled what became the massive Cominco smelter operations in the Kootenays. In 1891 principal figures in the CPR also financed Vancouver's sugar refinery. MacKenzie and Mann, the principal figures in the Great Northern bought out the prominent local Dunsmuir family's Vancouver Island coal mining interests. The influx of capital came

³⁷¹ Sources: R.D. Turner. *The Pacific Princesses. An Illustrated History of Canadian Pacific Railway's Princess Fleet on the Northwest Coast*, (Victoria: Sono Nis, 1977) Appendix I and Ship Registries, Ports of Victoria, Vancouver and New Westminster, and Steamboat Inspector Reports. PABC GR806.

³⁷² Eric W. Sager. "The Shipping Industry of British Columbia," paper presented to the Canadian Historical Association Annual Meeting June 1983, Table 4.

³⁷³ Sager, "B.C. Shipping," p. 21-2.

not just from eastern Canada. Eastern American capitalists financed a merger in the fish processing industry in 1902 which saw 60% of the locally owned canneries swallowed up by the eastern American backed B.C. Packers Company. American firms dominated the Kootenay mines until the turn of the century and after that there was increasing American presence in forest resources. British investment came largely via infrastructure and utility investments.³⁷⁴

While capital may or may not have become more expensive for local firms there was no shortage of capital from outside the province. The flip side of the infusion of non-local capital was the disruption of the locally owned and integrated resource/commercial/manufacturing/transport network. Local capitalists sold their interests in the resource and transport sectors and substantially withdrew to commercial and real estate ventures.³⁷⁵

This study highlights another feature of the impact of "transportation capital". There was virtually no cost to the transport companies to carry manufactured goods that they would use themselves or supply to their corporate connections. The additional cost to the CPR, for example, to ship a boiler or engine for their own use from Toronto, or Glasgow, to Vancouver would have been nearly nil.³⁷⁶ The CPR, in taking advantage of this privileged position, built at least five vessels in Toronto and shipped them, disassembled, by railway to B.C. One of the vessels alone filled 19 carloads. Needless to say, no other firms operating in B.C. built or delivered vessels in this

³⁷⁴ For the presence of British capital see: Baskerville, "Financial Capital and the Municipal State;" Patterson, *British Direct Investment in Canada 1890-1914*; For the increasing degree of non-local ownership in the salmon canning industry see: Reid, "Company Mergers in the Fraser;" pp. 306-327; in the forest industry see: Lawrence, "Markets and Capital;" in the mining industry see: James Douglas Nicol, "Changing Spatial Patterns in the Lode Metal Mining Industry of British Columbia, 1887-1945." Unpublished M.A. thesis, University of British Columbia, 1971.

³⁷⁵ On the integration of the local capitalist class see P.A. Baskerville, "De-industrializing the Island: Vancouver Island and the Industrial World 1881-1901", 1986 (Unpublished paper presented to 'Islands 86' Conference at the University of Victoria).

³⁷⁶ Given the lack of competition in the shipping industry, monopolies on some routes, it is reasonable to assume that the marginal cost of transporting goods would be less than the price charged to customers (market price).

way.³⁷⁷ This "no-cost" transport available to transportation companies, like the CPR or the Union Steamship Company may account for the surge in the use of British boilers in the twentieth century (Figure 6).³⁷⁸

While establishing that non-locally owned firms tended to have different purchasing patterns which favoured non-local manufacturers, the boiler and engine data leaves open the question of why this should be the case? One possibility, compatible with an orthodox neo-classical economic model suggests that eastern based firms tended to purchase from other eastern based firms based on historic trading relationships, personal contacts, or physical proximity to the decision makers.³⁷⁹ There is some circumstantial evidence to support this. For example, the CPR bought the majority of their engines from Polson Iron Works in Toronto and CPR ships were practically alone in this regard.³⁸⁰ It is also compatible with the neo-Marxist approach which predicts that non-local capitalists will syphon off the "linkages" from the staple industries to benefit the metropolis.³⁸¹ Both explanations point to the conclusion that this type of linkage is not technologically but socially defined.

In summary, the evidence that the integration of British Columbia into the national capital market actually increased the costs of capital to British Columbia

³⁷⁷ The CPR's assembly of ships at Nelson, British Columbia in 1899, for example, made Nelson the largest "shipbuilding" centre in Canada in that year, second only to Montreal; see Canada, "Tables of Trade and Navigation," *Sessional Papers*, 1900; The Bonnington, assembled in Nakusp in 1911 filled 19 cars; see Turner, *Sternwheelers and Steam Tugs*, pp. 54, 78.

³⁷⁸ This explanation is consistent with the fact that there was a considerable UK presence in ships boilers which could be delivered to British Columbia shipyards by steamship. In contrast, there was almost no British presence in the stationary boilers used on land.

³⁷⁹ Copithorne, *A Neo-classical Perspective*, pp. 17,22.

³⁸⁰ Using the period 1900-1910 as example, the CPR added 10 ships to their Kootenay fleet, the successor to the Columbia and Kootenay Steam Navigation Company, three of which re-used engines from decommissioned boats. Polson engines were used in 5 of the remaining 7. In the other two vessels there was an engine from Bertram Iron Works, Toronto and one from Hamilton Engine Works, Peterborough. The CPR accounted for over half of all the Polson engines installed on B.C. built ships in this period. Source: Turner, *Sternwheelers and Steam Tugs*, Appendix 1, and Ship Register .

³⁸¹ Marchak, *Green Gold*, 17; Another possibility, that non-local capital and resource companies had specific requirements for manufactured goods not available in British Columbia is considered below. Detailed research into the records of the companies involved may yield a more complete explanation of why companies acted as they did.

manufacturers is suggestive but not conclusive. No evidence exists showing relative costs of capital. The evidence from the records of Albion Iron Works is suggestive of the failure of the regional manufacturers to utilize corporate structures to best take advantage of capital raising opportunities. But while we know little about the effect of the CPR and the subsequent economic integration on the capital market in British Columbia the boiler and engine study does reveal structural changes that accompanied the railway. The new levels of non-local ownership of capital and resources brought with it new purchasing patterns and hence siphoned away linkages to the local manufacturing sector.

The final factor of production included in the set of production relationships considered here, entrepreneurship, is cited by both the dependency and export base schools as a critical.³⁸² It is the crucial factor to the extent that it is the key to the organization of all the others. The supply of entrepreneurial talent is difficult to measure and even more difficult to account for. Also problematic is the question of whether entrepreneurship is an independent factor of production or whether certain production structures encourage entrepreneurship.³⁸³ These questions assume importance where the supply of entrepreneurial talent is insufficient but if we can measure the supply of entrepreneurial skills by economic success and innovation³⁸⁴ a cursory look at nineteenth century British Columbia suggests that the region was producing skillful local entrepreneurs.³⁸⁵ Why many of these successful entrepreneurs sold off their

³⁸² George Leader and Laggard; Fogarty, "Limits of Staple Theory.". Naylor, "History of Domestic and Foreign Capital in Canada," Acheson, "National Policy".

³⁸³ Watkins, "The Staple Theory", p. 57.

³⁸⁴ Again we come up against the problem of the *post hoc ergo propter hoc* relationship.

³⁸⁵ see: J.M.S. Careless, "The Business Community in Victoria," *Historical Essays on British Columbia*, ed. J. Friesen and H.K. Ralston. (Toronto: McClelland & Stewart, 1976), 155-166; and "The Lowe Brothers, 1852-1870. A Study of the Business Relationships on the North Pacific Coast," *B.C. Studies*, No. 2, (Summer 1969), 1-18; and G.W.S. Brooks, "Edgar Crow Baker: An Entrepreneur in Early British Columbia," *B.C. Studies*, No. 31, (Autumn 1976), 23-45; and D.G. Patterson, "European Capital and British Columbia: An Essay on the Role of the Regional Entrepreneur," *B.C. Studies*, No. 32 (Winter 1976-77), 33-47; H.K. Ralston, "Patterns of Trade and Investment", and "John Sullivan Deas: A Black Entrepreneur in the British Columbia Salmon Canning Industry", *BC Studies*, No. 32, (Winter 1976-1977) pp. 64-78; Irene Robertson, "The Business Community and the Development of Victoria, 1858-1900;" Kathleen Sacht, "R.P. Rithet, Merchant-

industrial investments at the turn of the century requires further investigation.

One aspect of entrepreneurial skills that has not yet been investigated and appears to have been lacking in British Columbia is marketing skills. Eastern manufacturers took advantage of national advertising and marketing opportunities.

Another hypothesis that is often proposed to account for the demise of the regional manufacturing sectors is based on the advantages of large scale production available only to firms with large potential markets. Market size, however, as was seen for the boiler and engine industry are a result of how freight rates were structured. Did the freight rate structure or other limitations on market size prevent British Columbia manufacturers from reaching the economies of scale obtainable by eastern manufacturers? The literature on whether or not economies of scale were a factor in the centralizing process is mixed but the even those who claim that there were economies of scale estimate them to be quite small.³⁸⁶ Boiler and engine makers as well as other equipment manufacturing companies from south-central Ontario and Montreal were especially prompt and prominent in establishing British Columbia branch offices.³⁸⁷ What are probably the most important "returns to scale" are the non-pecuniary ones which are impossible to measure. Larger markets imply larger turnover, more cash flow, more employees, and more widely dispersed ownership. The result was that large eastern firms probably had more leverage negotiating freight rate concessions and had more influence with the different levels of government as well as

Entrepreneur in Victoria British Columbia 1860-1900," Unpublished B.A. Essay, University of Victoria, 1983; D.M. Thornton, "Victoria's Relative Economic Decline: The Case of the Albion Iron Works," Unpublished B.A. Honours Essay, University of Victoria History Department, 1984; P.A. Baskerville, "De-industrializing the Island: Vancouver Island and the Industrial World 1881-1901," unpublished paper presented to 'Islands 86' Conference at the University of Victoria, 1986.

³⁸⁶ Dales, Caves & Holton, and Chambers & Gordon for example discount the importance of economies of scale while Caves and Inwood give support to its importance. Dales, *The Protective Tariff in Canada's Development*, (Toronto: University of Toronto, 1966) pp. 159-166; Caves and Holton, *Canada's Prospect and Retrospect*, p. 175 E. Chambers and D. Gordon, "Primary Products and Economic Growth," 315-332; R. Caves, "Export Led Growth and the New Economic History," in J. Bhagwati, et al, *Trade, Balance of Payments and Growth*, (New York: American Elsevier for North Holland, 1971) pp. 403-442. Inwood, "Economic Growth and Structural Change," pp. 22-3;

³⁸⁷ McDonald, "Economic Development of British Columbia," p. 375.

other more prosaic benefits such as the ability to weather price wars, flexibility to diversify, the ability to adopt national marketing strategies, and more power to deal with labour. Unfortunately the data does not exist to provide an accurate comparison of economies of scale between British Columbia and other firms.

The influx of eastern capital after the arrival of the CPR suggests that capital shortage was not a problem for the British Columbia economy, even if it implied outside ownership. But from Table 19 it is clear that profitability in the British Columbia engine and boiler industry lagged behind that of Ontario and Canada even before there was significant non-local ownership in the economy. British Columbia manufacturers appeared to be in an advantageous position with respect to material input costs and transportation costs with respect to the coastal market. The little evidence available is inconclusive on the question of whether capital costs may have been higher in British Columbia and on the possibility of significant scale economies. The one remaining input that remains to be considered is labour. It appears that British Columbia firms competed in the same capital and product markets as other firms on the continent but in a different labour market.³⁸⁸

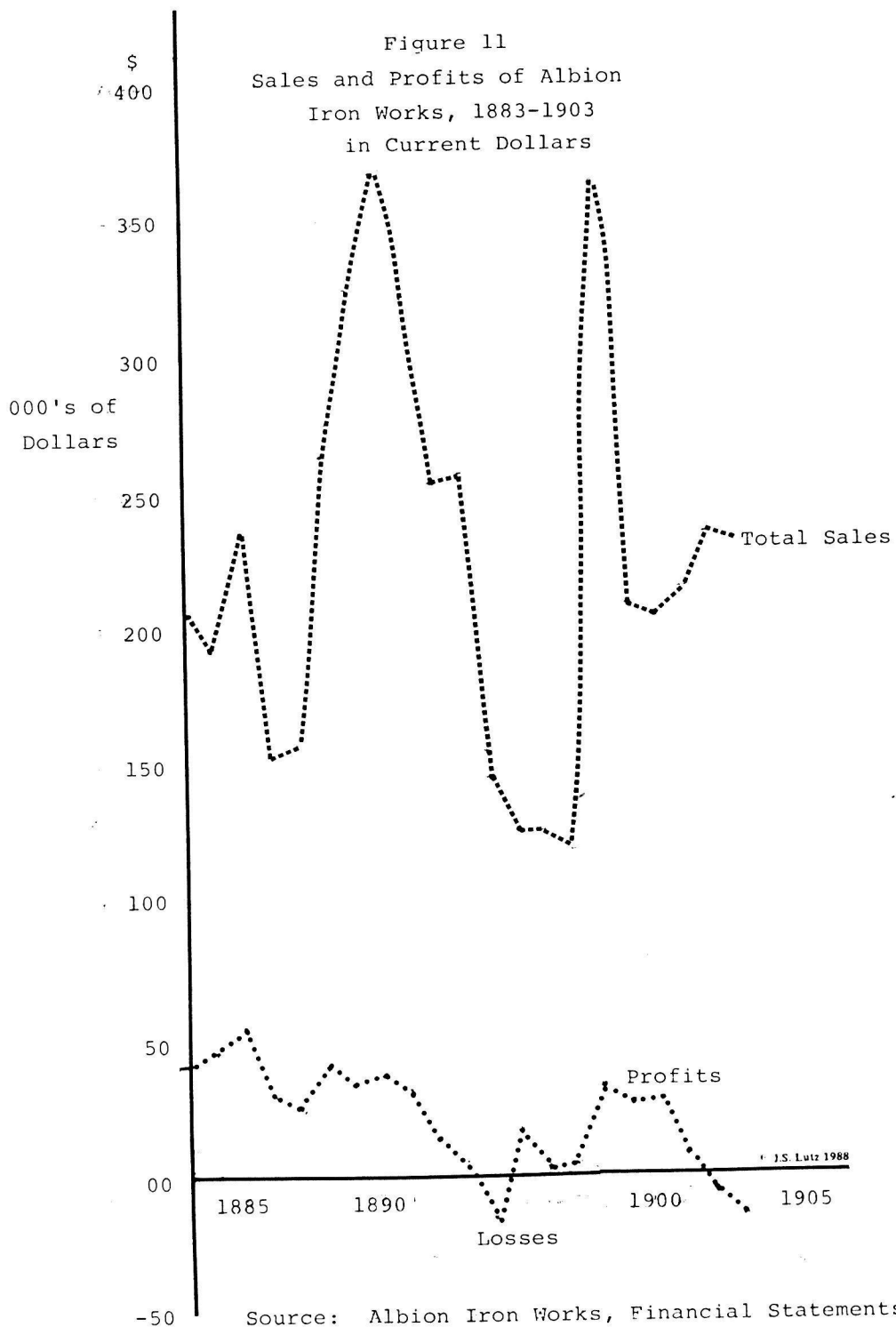
Figure 12 illustrates that the wages paid by British Columbia firms exceeded those of their competitors by as much as 50% through the period 1901-1915 and other evidence suggests that British Columbia manufacturing wages had been higher at least back to the 1880-1 census.³⁹⁰ Table 7 illustrates the share of labour cost per unit of

³⁸⁸ Real wages did not converge between B.C. and the rest of Canada until after World War I. The implication is that labour was not mobile enough to take advantage of wage differentials and hence there was more than one labour market. see: Allen, "B.C. Past, Present and Future." p. 23; Green, *Regional Aspects of Canada's Economic Growth*, p. 64.

³⁸⁹ * This figure seems to be the result of a reporting anomaly: Only one firm is enumerated in this category, presumably Albion and in their 1890 financial statements for all their branches wages as a share of output equalled .446; See Table 17 for more details; Source: Canada Census 1881, Vol. III; 1891, Vol. III; 1901, Vol. III; 1911, Vol. III; Albion Iron Works, Financial Statements, PABC.

³⁹⁰ For comparative wages for 1900-1915 see Canada, Department of Labour, *Wages and Hours of Labour in Canada, 1901-1920*, Report No. 1 (Ottawa: Issued as a supplement to Labour Gazette, March 1921); and Canada, Board of Inquiry into Cost of Living, *Report of the Board*, (Ottawa, 1915) Vol.1, pp. 558-590; Earlier data is available from the annual reports of the Immigration Agents in *Canada Sessional Papers*, 1891;

Figure 11
 Sales and Profits of Albion
 Iron Works, 1883-1903
 in Current Dollars



Source: Albion Iron Works, Financial Statements, PABC.

Table 20
Wage Costs as a Percentage of Output Costs of the
Boiler and Engine Industry for the Census Years 1880-1910³⁸⁹

	B.C.	Ontario	Canada
1880-1	47.3	27.6	29.0
1890-1	13.3*	28.5	28.5
1900	49.4	38.7	39.9
1910	38.2	37.7	30.7

output and demonstrates that over the entire study period, wages accounted for a much higher share of the value of output in British Columbia than in the rest of Canada. It seems evident that a large part of the lower profitability of boiler and engine manufacturing in British Columbia can be attributed to the higher cost of labour.

Altman, however, has recently argued that higher wages need not be a handicap to an economy's competitiveness if they are a reward for higher productivity.³⁹² Table 21 indicates that British Columbia labourers were in fact more productive than their eastern counterparts while Table 22 is an attempt to evaluate whether or not the rewards to labour were greater than their higher productivity would suggest. By expressing value added per dollar of wage labour Table 9 shows that labour was paid more than its higher productivity would warrant, and thus wages ate into the

Buckley and Urquhart, *Historical Statistics of Canada*, provide some general comparisons for 1887-9, and the decennial censuses provide average income per worker estimates.

³⁹¹ * For discussion about the reliability of the figures for 1890-1 see Table 17; Source: *Canada Census* 1881, Vol. III; 1891, Vol. III; 1901, Vol. III; 1911, Vol. III.

³⁹² Altman, "Economic Development with High Wages," R.C. Allen, "Trade Unions and the B.C. Economy," *Restraining the Economy*, (Vancouver: New Star, 1986), pp. 225-253, makes this point.

Table 21
Value Added per Employee in the Boiler and Engine
Industry for the Census Years 1880-1910 in Current Dollars³⁹¹

	B.C.	Ontario	Canada
1880-1	\$1,120	\$579	\$608
1890-1	1388*	988	779
1900	1283	699	705
1910	1271	955	1293

profitability of British Columbia firms.³⁹³ This, of course begs the question of why wages were more expensive in British Columbia.

Table 22
Value Added Per Dollar of Wages in the Boiler and Engine Industry
for the Census Years in Current Dollars 1880-1910³⁹⁴

	B.C.	Ontario	Canada
1880-1	1.36	1.59	1.75
1890-1	2.50*	2.32	1.90
1900	1.47	1.59	1.54
1910	1.70	1.61	2.08

³⁹³ Assuming a fixed market price.

From Allen and Copithorne comes one explanation for the existence of higher wages in British Columbia; labour in British Columbia was able to capture some of the economic surplus (rent) from the extremely rich British Columbia resources. The resources were rich enough to produce economic rent above and beyond a normal profit and this was split between capital and labour. Allen argues that this is especially so in the resource and construction industries while Copithorne suggests that the high wages in the resource industries will also spill over to their backward linkages, specifically the metal fabricating (boiler and engine making) sector.³⁹⁵ If the labour market was not fully integrated into the national market then as long as labour was able to capture part of the resource rent in the resource industries, the manufacturing industries would have to compete for the same labourers and offer comparable wages. This is in contrast to Chambers and Gordon model which assumes that it will be the manufacturing sector that sets the wage rate.³⁹⁶ A higher cost of living in British Columbia may also have bid up wages but price indices that allow us to compare the cost of living in British Columbia to the rest of Canada have not yet been extended back to the nineteenth century.

An analyst for *Moody's*, "The National Investor Magazine" writing in 1913 declared the secondary iron and steel industry on the west coast moribund due to competition from Eastern Canadian and American producers. He estimated that British Columbia manufacturers had to pay a 20-30% premium to labourers on top of what their eastern competitors paid, "owing to the well organized condition of labour."³⁹⁷

* For discussion about the reliability of the figures for 1890-1 see Table 17;

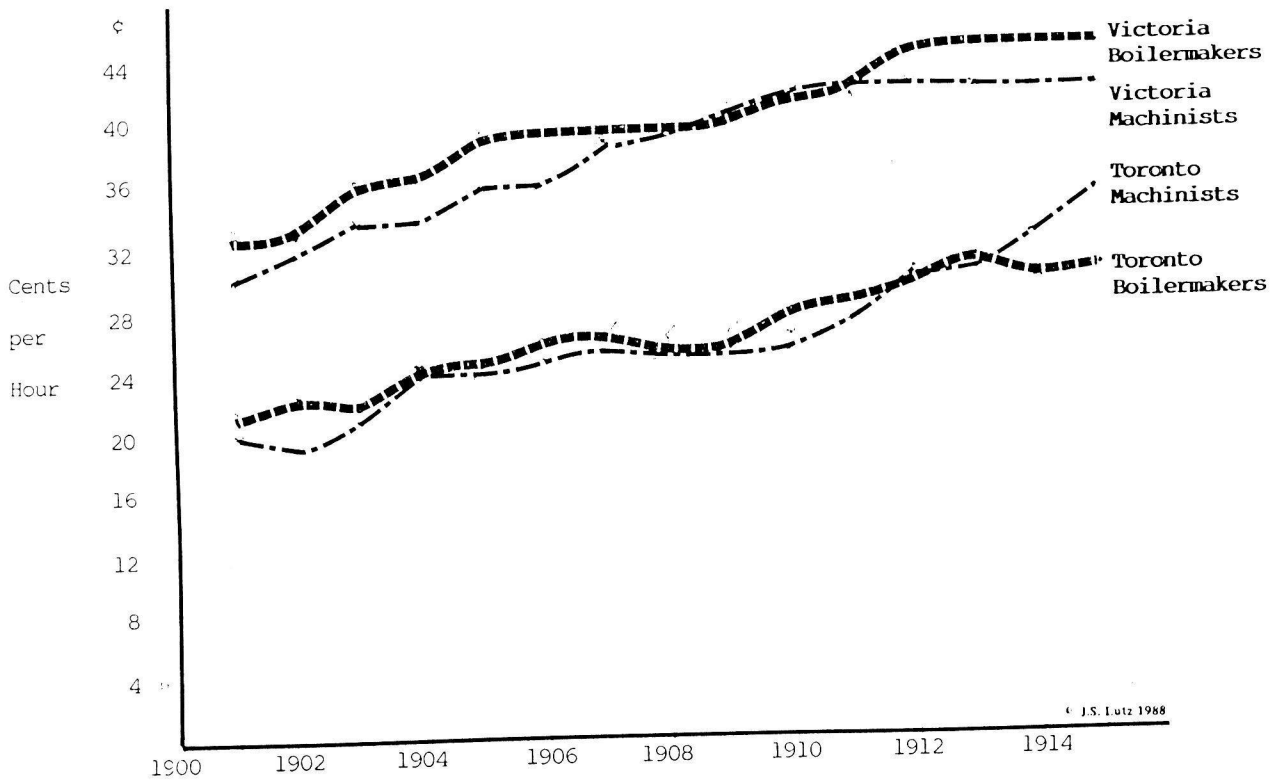
³⁹⁴ Source: *Canada Census* 1881, Vol. III; 1891, Vol. III; 1901, Vol. III; 1911, Vol. III.

³⁹⁵ Allen, "B.C. Past, Present and Future," pp. 25-7; Copithorne, *A Neo classical Perspective*, pp. 40-44.

³⁹⁶ Chambers and Gordon, "Primary Products and Empirical Growth."

³⁹⁷ He also suggested that eastern producers had savings on coal and power as well as economies of scale and notes the discriminatory effect of freight rates against British Columbia manufacturers. Swift, "Industrial Future of British Columbia," *Moody's Magazine*, pp. 483-490. Other evidence suggests that the British Columbia wage scale was much higher than in the neighbouring states and than in British Shipyards. See Paul H. Douglas, *Real Wages and the United States, 1890-1926*, (Boston & New York: Houghton Mifflin, 1930); Hamilton, *Western Shores*, pp. 156-7.

Figure 12
 Hourly Wages of Boiler Makers
 and Machinists, Victoria & Toronto, 1901-1915



Source: Canada, Department of Labour, Wages and Hours of Labour in Canada, 1901-1920, Report No.1, (Ottawa, March 1921).

High wages and the organized labour definitely affected the Albion Iron Works and was one of the reasons for its demise. The share of wages as a percentage of sales had increased from 37.9% in 1885 to 50.3% by 1901. The directors of Albion responded to the immediate market forces which surrounded them. Faced with fixed factor prices and markets they attempted to reduce the cost of the only input they had any control over.³⁹⁸ The company balked at paying union rates in 1901 and refused to hire union boilermakers. The boilermakers struck the Iron Works and were supported in their strike by shipwrights and longshoremen. In 1902 a handbill was posted around Victoria warning potential customers that Albion boilers were unsafe and that their other products were of inferior workmanship due to their use of scab labour.³⁹⁹ Albion's 1901 annual report noted that:

The disappointing profit on the company's operations at Victoria, \$5605.58 only, is due to the serious labour troubles... coupled with keen increasing competition on the part of other concerns.
...contracts amounting to over \$100,000 were secured by the directors but had to be abandoned due to a series of strikes...which rendered their fulfillment impossible.⁴⁰⁰

Two years later the Board of Directors were still refusing to hire union labour but lamented "owing to the difficulty of finding qualified workmen for this branch, the output was limited and the retail store in consequence did not handle the business they might have."⁴⁰¹ By 1904 the Bank of Commerce was calling on the directors to make good their personal guarantees of the \$30,000 overdraft, but the company struggled on to 1907 when fire destroyed the boilerworks and finally closed its stoveworks with voluntary liquidation in 1910.⁴⁰²

³⁹⁸ They also initiated a "Buy Local" campaign but this was somewhat counteracted by a union sponsored boycott of Albion products. O'Reilly papers, PABC.

³⁹⁹ Minute Books of the Victoria Lodge (191) of the Brotherhood of Boilermakers, Iron Ship Builders, of America, Dec. 10, 1901; Jan. 1, Feb. 11, 1902; held at the offices of Lodge 191, Esquimalt Road, Victoria B.C. and the O'Reilly papers, PABC.

⁴⁰⁰ Albion Iron Works, Annual Report, 1901, in O'Reilly Papers, PABC.

⁴⁰¹ Albion Iron Works, Annual Report, 1903, in O'Reilly Papers, PABC.

⁴⁰² Thornton, "Case of the Albion Iron Works," p. 37.

The foregoing discussion of the high costs of labour and its effects gives us a description of what was going on in the industry but not an explanation. Two contributing factors appear to have been the well-organized condition of labour combined with the rich resources allowing labour to capture part of the rent. McDonald argues that there was a chronic labour shortage and this would have enhanced the bargaining power of both organized and unorganized labour.⁴⁰³ Finally, a higher cost of living in British Columbia probably contributed to higher wage demands but the extent of the difference in the cost of living between British Columbia and elsewhere has not been studied.

Finally, a question which requires more consideration is whether or not British Columbia manufacturers and their competitors were really producing identical products. A hypothesis that has been suggested with regard to the Maritimes is that changing technology was responsible for shifting demand away from regional resources and the linked industries such as shipbuilding and the regional economy was unable to make the transition to the new technologies.⁴⁰⁴

Because of the detailed information provided in the shipping registries it is possible to compare the engines built in British Columbia to those built elsewhere and installed in British Columbia. It is clear from the registries that equivalent types of engines to those being imported, including gas engines, were being produced in British Columbia.⁴⁰⁵

Until 1895 the falling British Columbia share of the ship engine market was due to the increasing presence of eastern Canadian firms but after 1900 it was American.

⁴⁰³ McDonald, "Working Class Vancouver, 1886-1914: Urbanism and Class in British Columbia," p. 48.

⁴⁰⁴ Saunders provides a good example, see: *Economic History of the Maritime Provinces*.

⁴⁰⁵ This was also the case with ship hulls. While many of the imported vessels were steel hulled, B.C. shipyards had been building steel hulled ships since 1891. Twenty-nine iron or steel vessels, or 10% of the total iron/steel tonnage registered in British Columbia, were built by B.C. firms in British Columbia; the largest among these prior to 1915 was the Princess Maquinna, 1777 tons. See Sager, "The Shipping Industry of British Columbia," p. 17.

and predominantly eastern American, firms that took an increasing share (see Figure 7). The engines imported from the United States were almost exclusively gas engines, a new technology. The registries show, however, that both British Columbia and Ontario producers manufactured gas engines equivalent to those that were imported, based on measurements of bore, stroke and horsepower. As with the case of Ontario firms displacing British Columbia manufacturers, it appears that corporate linkages and perhaps more critical in this case, wage rates, outweighed the tariff firms advantages over eastern Canadians in servicing this burgeoning market.⁴⁰⁶

While the early decline of the British Columbia manufacturers' share of the ship boiler market was also a result of eastern Canadian incursions, the later decline came at the hands of predominantly Scottish producers (See Figure 6). Quality, reputation for quality, and marketing techniques may also differentiate products as much as features internal to the product and in the early 1900's the Scottish shipyards and founders had developed a good reputation. The boiler data allows us to test for one, admittedly crude, measure of quality, if we assume that lower quality manufacturers will have a greater percentage of their boilers fail inspection or explode. The reports of the boiler Inspectors show no co-relation between manufacturer and failure although more sophisticated tests need to be done.⁴⁰⁷ The reasons for the British penetration of the ship boiler market, in addition to a reputation for quality on behalf of Scottish firms, appear to be similar to those that allowed eastern Canadian manufacturers access. The increasing profile of the Scottish financed shipping company, the Union Steamship Company on the west coast affected overall purchase patterns. The Union Steamship Co. bought its ships and engines exclusively from Scotland. Large purchases by the CPR, which in the post-1900 period exhibited a changing preference to buy

⁴⁰⁶ For the American advantage in wage rates see: Swift, "Industrial Future of British Columbia," pp. 483-490. Patent regulations may have been another contributing factor.

⁴⁰⁷ Steamboat Inspector Reports, PABC GR806; "Report of the Chief Inspector of Machinery," *British Columbia Sessional Papers, 1902-1915*; for their reputation for quality see: Turner, *Sternwheelers and Steam Tugs*.

British instead of eastern Canadian also affected the market. Also important is that wage rates and material costs in Scotland, at least by the end of the period, were much cheaper than in British Columbia.⁴⁰⁸ The evidence suggests that the most important change in the British Columbia manufacturing sector was not the technology but ownership. British Columbia firms met the requirements of the Columbia and Kootenay Steam Navigation Company, the Canadian Pacific Steam Navigation Company, and the E&N Steamship Company until these were bought by the CPR and after that point the linkages were transferred out of British Columbia.⁴⁰⁹

The boiler and engine case study confirms that in this industry at least, the transference of manufacturing from British Columbia to central Canada was occurring alongside a movement of manufacturing to the U.S. and Great Britain. The data forces us to shift the focus of the centralization debate. First, the standard staple approach focuses on the physical characteristics of natural resource products. It has not considered the effect of many of the factors that comprise the production system of staple extraction, including the linkages to the manufacturing sector.⁴¹⁰ It is assumed *post hoc* that staples have weak linkages to manufacturing, especially to the capital goods sector, and thus staples fail to generate the multiplier effects that would bring in a manufacturing labour force, stimulate consumer demand and allow manufacturing thresholds to be reached.⁴¹¹ The boiler and engine data however force the debate away from the question of the characteristics of the staple -- clearly they had linkages to the manufacturing sector -- to an examination of where those linkages would be located and why. Any type of resource extraction will require inputs of capital and labour of

⁴⁰⁸ Hamilton, *Western Shores*, p. 156-7.

⁴⁰⁹ In the specialty market for mining, canning and lumbering machinery the technology and the products were more differentiated. Albion Iron Works was responsible for inventing some machinery specific to the salmon canning industry. On the other hand there is evidence that one of the owners of Albion was buying mining machinery from elsewhere. See: *The Resources of British Columbia*, V. 1, N 10, December 1883, p. 42; Stacy, *Sockeye and Tinplate*, and Thornton, "Case of the Albion Iron Works," pp. 26-7.

⁴¹⁰ Pomfret, *Economic History of Canada*, pp. 33-9.

⁴¹¹ Inwood, "Economic Growth and Structural Change," p. 10.

some amount. How much capital, the type of capital goods, and the amount of labour are important questions, especially when the debate shifts to market size; still market size is ultimately a result, not of the particular characteristics of the staple and its linkages but of the institutional frameworks which determine where the linkages will be located.

By examining the production system of the boiler and engine makers this chapter concludes that British Columbia manufacturers had three major strikes against them. First, their products were more expensive to make due, not to high material costs, but high labour costs. Though we lack price data for the finished products this fact allows two possibilities. Either the British Columbia boilers were more expensive and therefore local and non-local firms were "Profit Maximizing" when they bought non-locally, or the British Columbia manufacturers sold their products at the market price and were less profitable than their eastern competitors. The production systems approach allows us to look beyond the price levels prevailing in the labour market to examine why the wages were high. The well organized condition of labour, rich resources, labour shortages and a higher cost of living all may have contributed to the high wages paid in British Columbia.

The Production Systems approach also reveals that wages alone do not account for the decline of the secondary manufacturing sector in British Columbia. From Tables 19, 20, 21 and 24 we know that high wages limited the profitability of the British Columbia boiler and engine industry even prior to the 1881 census, yet it is not until after 1885 that we see the relative decline of the industry, and until after 1910 that absolute decline sets in. The relative decline after 1885 appears to be a response to the second major factor, the arrival of the Canadian Pacific Railway and the structure of transportation rates which discriminated against British Columbia manufacturers supplying the interior of British Columbia, the Prairies, or competing in eastern

Canada. The final explanatory factor is that after the mid 1890's the economy was increasingly owned by non-local capitalists and they, for reasons about which the evidence does not allow a conclusive judgement, preferred to purchase goods from other non-local firms. This appears to have further reduced the demand for British Columbia produced products and ultimately contributed to the absolute decline of the industry.

The result was that while prior to the turn of the century the resource sector was linked to local manufacturers by the demand for boilers and engines but thereafter these linkages were increasingly appropriated by Ontario, American and British manufacturers. Even while the British Columbia resource sector was steaming ahead at full speed the boiler and engine makers of British Columbia were losing the "race for dear life against swift and winged time."

Chapter 8

Conclusion

Out in the west the west was also, by the 1890's, becoming the past. The more one looked around in the west the more it seems obvious that the past was hanging around for a while. It became clearer all the time that the future was getting ready to move in, and the future of the west was going to be the east....

*George Bowering
Caprice**

Since 1860 manufacturing has been "big business" in British Columbia. Tax assessment rolls for that year reveal that Victoria, the only settlement that approached "city" status in what is now British Columbia, had a manufacturing sector comparable in size and diversity to the cities of southern Ontario. As settlement spread so did manufacturing, as it did in new regions all over North America. What was exceptional about British Columbia, was the large percentage of employment in manufacturing relative to elsewhere, and the amount of output per person. In 1880, for example, New Westminster had a higher manufacturing output per capita than any city in Canada. In 1890 and 1900 British Columbia had the highest output per capita of any province in Canada. By 1910 British Columbia was the third largest producer of manufactured products in the country.

From the 1860's to 1915 British Columbia was a manufacturing as well as a resource extracting province. Most British Columbians were wage labourers and more worked in the manufacturing sector than in any one of the resource extractive sectors. The largest of these firms and the largest employer was, since 1880, the primary manufacturing sector but until the turn of the century the secondary manufacturing sector outproduced the primary.

* George Bowering, *Caprice*, (Penguin: 1987) p. 108.

Statistics of the production of resources, and of processed manufactured goods like lumber and canned fish, of consumer products like beer and cigars, or investment goods like ships, show the British Columbia economy booming in the early 1860's and then again in the late 1870's. Despite a few crises in 1892, 1908 and 1913 and the sudden increase in economic activity caused by the Klondike Gold Rush in 1898, the trend of the British Columbia economy was steadily and strongly upward. In the period 1880 to 1910 alone, British Columbia's Gross Domestic Product (GDP) grew at an annual rate of 9.84%, compared to 3.84% for all of Canada.⁴¹² Growth, however, was uneven across the economy. Figure 1 shows that the growth in the resource extractive sector was steady from 1875. On the other hand, chapters 6 and 7 and the figures in Appendix 6 show that the development in the secondary manufacturing sector was unsteady. The food and drink sectors grew steadily, as did population growth but clothing, semi-durables, and the producer goods sector, experienced a dramatic decline in the decade 1890 to 1900 and then exhibited a mixed performance from 1900 to 1915. According to the commonly held notion of industrialization, elaborated in the Canadian context most explicitly by Gilmour, the British Columbia economy "de-industrialized" in the decade 1890-1900, and the maturity defining sectors continued to decline through to 1915.

The divergent growth paths of the different elements of the British Columbia economy have received little attention. This thesis then is presented as a preliminary contribution to charting those paths and placing the British Columbia economy in its national and global economic context. In some respects the literature on the relative and absolute decline of the secondary manufacturing sector in the Maritimes provides starting points. That there was some mechanism or mechanisms that account for the centralization of Canadian secondary manufacturing industry in Southern Ontario, and

⁴¹² And population grew at 6.89% per year compared to 1.72% for Canada. Allen, "B.C. Past, Present and Future," p. 14, 15.

North American secondary manufacturing in the contiguous American North East, seems obvious. What has been less obvious is that some of the linkages from the industrial frontiers were also locating or relocating in the United States and Britain. The boiler and engine case study suggests that the relative and absolute decline of manufacturing in British Columbia was one manifestation of not just a national but an international division of economic activity. A comparison of how these forces affected the eastern and western industrial frontiers of Canada reveals some common factors and others that are unique to British Columbia. There is for example, evidence that the decline of the secondary manufacturing sector in the east and west coincided with an increase in the amount of non-local ownership of the regional resource and manufacturing sectors.⁴¹³

In general the explanations for the decline of the Maritimes and for the present state of the British Columbia economy are discussed in terms of either the dependency or export base models. Neither focusses on the international aspects of the process of regional economic growth and decline nor do they fit the complexities of the British Columbia case very well. Both have the problems of internal consistency or logic discussed in Chapter 2.

The export base model fits the pre-railway era in British Columbia in its general tenor, but it totally misses the dynamics of the post-railway era. Instead of being propelled by a booming resource base, and the resource base continued to boom, the industries in the secondary manufacturing sector most directly linked to the resource base, like boilers and engines, declined or languished. One of the difficulties with testing the export base approach is the *post hoc* nature of the reasoning -- if a region fails it has a staple with poor linkages (or a lack of entrepreneurial skills). This study of British

⁴¹³ Acheson, "The National Policy and the Industrialization of the Maritimes,"; David Frank "The Cape Breton Coal Industry and the Rise and Fall of the British Empire Steel Corporation," *Acadiensis*, VI, (Autumn 1977), pp. 3-34. McCann, "Pictou County." This approach has been suggested for British Columbia by Resnick, "Political Economy of British Columbia," p. 6.

Columbia however, shows a region in which the linkages between the resource industries and the secondary manufacturing sector not only existed as potential but were manifest, until the turn of the century.

The boiler and engine data allow us to refine our understanding of "linkages" and "prices" as institutionally or socially defined. All products require some inputs and many require refining of outputs. The production process is a result of not just characteristics of that product and the level of technology but the social system and institutional framework in which production takes place. What these linkages will be is an interesting question but for regional development it is less germane than where they will locate. The British Columbia secondary manufacturing sector declined not because capital was too expensive or not available in British Columbia but partly because that capital and the resources it could command, were owned elsewhere. Non-local capitalists had different purchasing patterns from local capitalists. The physical location of the ownership of British Columbia's resource, transportation and manufacturing industries directed where inter-industry linkages would be located, and this as much as any other integrating factor, drew British Columbia into the continental economy.

Like linkages, prices are a product of institutional forces of which the "free" market economy may or may not form a part. Transport and tariff rates for example have been set for the British Columbia economy by institutions that have multiple objectives, many inconsistent with economic efficiency. Having said this, once historical analysis has established the social rationale for the price structure in the transport and labour markets, then given the price structure the resulting pattern in British Columbia is consistent with location theory and the theory of comparative advantage, aspects of export base theory.

The discovery that extra-regional investment and institutions played a part in the de-industrialization process affirms the conclusions of many dependency theorists but is only one piece of a large puzzle. The dependency approach also has its internal inconsistencies and lacks a firm theoretical foundation. Applied to British Columbia the dependency approach has overlooked the pieces of the explanation which are grounded in conditions within the region itself. The dependency approach has difficulty accommodating the early growth of the secondary manufacturing sector, the strength of the local entrepreneurs and the strength of British Columbia labour. The post-railroad era is more consistent with the broad outline of dependency theory but the search for an explanation reveals that it was as much factors within the region, such as high wages, as it was outside factors that were responsible for the decline of regional secondary manufacturing.

Both the major analytical traditions have strengths, depending on the specific nature of the questions being asked, but they have tended to divide the literature into either studies of structure that lack empirical evidence and empirical studies of the effect of different input factor prices which ignore how those prices have been set. Because the nature of one's theoretical perspective defines what is considered relevant and hence defines what the "facts" are, the respective foci of the export base and dependency theories explain why there are so few studies of secondary manufacturing, local capitalists, or transportation networks in British Columbia.

The production system approach appears to combine the strengths of both and thus provide a useful window through which we can observe economic development. Like the other approaches it too defines its own set of facts but it examines a more complete set of relationships and avoids some of the inconsistencies and determinism of either of the two standard approaches. By focussing on the set of relationships emanating from the production process it is rooted in the historical circumstances

selves first, unable to take advantage of expanding local markets and later, forced out of local markets that they had previously dominated.

Transport relationships had another important effect on British Columbia. While the Canadian Pacific Railway was the vehicle over which much of the capital and commodities travelled into British Columbia, it was also important for what it did not do. It did not have the effect of equalizing wage rates across the country in this period. High wage rates in British Columbia appear to testify both to the relative richness of the natural resource base of the province and to the fact that the railway was unable, in this period, to overcome the isolation of the British Columbia labour market from the national labour pool. Rich resources and labour shortages combined to enhance the relative strength of organized labour. Some portion of the higher than average wage may have been compensation for a higher cost of living though the extent of this influence awaits the creation of real wage estimates extending back to the 1880's. Paradoxically, high local labour incomes which ought to have created a local consumer market, adversely affected the ability of the British Columbia secondary sector to compete in local and continental markets. Ironically, it appears that it was the success of the resource industries and not their failure, caused the decline of the boiler and engine industry, and perhaps by extension, the secondary manufacturing sector.

Other factors often cited to explain the relative decline of the Maritime and Quebec manufacturing sectors, namely material input costs, tariffs and lack of entrepreneurial skills appear to have little significance in this case. That material costs do not have more significance in the relative advantages and disadvantages of manufacturing in British Columbia is a surprising conclusion and suggests that more detailed industrial histories need to be done. The evidence on the remaining elements of the cost function: economies of scale (including such non-pecuniary economies as the ability to set up national marketing networks) and capital costs remain inconclusive.

The study suggests that at least over a 50 year period an economy can grow while it "de-industrializes". High wages and a high regional income can exist as the economy becomes increasingly specialized in resource production as long as the resource base continues to expand. The low regional income of the Maritimes does, however, suggest what happens to an economy specialized in resource extraction, when the resources run out or their relative value declines.

One key advantage of the production system approach is that it encourages an examination of the institutional structures that channel production. Orlove remarks that the 'production system' type of approach:

allows the nature of internal divisions to be established empirically, rather than assuming the sort of differentiated interdependence that modernization theory proposes or the division into two antagonistic classes that dependency theory suggests. It assumes the state is a crucial element in the process of change because of the importance of political constraints, but it does not declare beforehand the nature of the relations between the economy and the state.⁴¹⁵

In British Columbia over the study period, the adoption of the Canadian tariff in 1872, the National Policy tariffs in 1879, unionization of an unusually large portion of the labour force and a shift out of British Columbia of the ownership of resources all shaped the production systems of industries and firms. The effects of these changes on the British Columbia economy remain largely unstudied.

This thesis points to Confederation in 1871 as the most important of these institutional shifts as a pre-condition for the National Policy. The tariff aspect of the National Policy may have provided some early assistance to British Columbia manufacturers but it was the arrival of the Canadian Pacific Railway, an event which has to be understood in its National Policy context, which drastically altered the shape of British Columbia economy. The railway was the major intervening variable not because it lowered transportation costs; rather it brought British Columbia closer to

⁴¹⁵ Orlove, *Alpacas, Wool and Men*, p.18; He contrasts the dependency approach with the modernization approach. The export base model can be collapsed into the more general modernization approach (see Chapter 2).

Canada in transport time.

The Canadian Pacific Railway was more than a physical link to Canada. It brought British Columbia into national and international commodity and capital markets and ultimately, though not, in the period under study, labour markets. The boiler and engine study indicates that the increasing level of non-local ownership of British Columbia resources and businesses, which was part of the railway induced integration into the national and international economy, brought with it a new set of linkages. Non-local firms tended to purchase inputs from non-local suppliers regardless of the production function of the product. The cumulative effect of increasing non-local ownership, high labour costs and a discriminatory freight rate structure in British Columbia after 1890 was to encourage a specialization in resource products at the expense of secondary manufacturing.

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Appendix 1

Definition of Manufacturing and Industrial Establishment

Manufacturing is defined for the purposes of this thesis as the transformation of material goods for sale consumption takes place in an industrial establishment. The definition of an industrial establishment used in this thesis is the definition in use in Canada over the course of this study. It was broader than the definition currently in use, but narrower than the definition used by the contemporary United States Census. The Canadian census from the 1870-1 Census through to the 1890-1 Census defined:

An industrial establishment is a place where one or several persons are employed in manufacturing, altering, making up or changing from one shape into another, materials for sale, use or consumption.¹

The definition is clarified to some extent in Bulletin No. 10 published by the census in 1892:

Limestone is a raw product, the taking of which out of the quarry pertains to mining. The burning of limestone is an operation which changes the form, employs labour and capital to effect the change and gives the product an enhanced value. The census returns do not take cognizance of the quarrying, in connection with industrial establishments. Breaking a big stone into a score of smaller stones does not change the form though the result is an article of increased value. The preparation of limestone and its transformation into an article altogether different in appearance from the original constitute the lime kilns, in which the operations are carried on, industrial establishments, to be included in the returns of the census.²

A butcher shop is not considered an industrial establishment despite the fact that:

... a "porker" strung up by his heels in the doorway is changed very considerably in appearance in consequence of the operations denuding him of his bristles and depriving him of his interior.³

If the "porker" is cut up however, and then smoked, canvassed, pickled or otherwise prepared, the establishment where these operations take place is considered an industrial establishment and the operations, manufacturing.⁴

In 1901 and again for the census of 1911 firms employing less than five workers were considered to be "workshops" and were excluded from the census whose intent it was to enumerate "factories". The rationale for this requirement was to limit the scope of the census to "statistics of the factory system as distinguished from those of the domestic or hand system of labour" and specifically to exclude small firms engaged in "baking, blacksmithing, basket-making, carpentry, dressmaking, shoemaking, spinning, tailoring and weaving," from the statistics of manufacturing.⁵ However, in the 1891 census it was evident that these "domestic or hand trades" comprised a significant percentage of production in British Columbia, and this exclusion can be expected to add a downward bias to the 1901 figure. However the percentage of output produced by firms with less than five employees appears to have been decreasing over time. For the bias this has on the 1901 published census figures see Appendix 2.

¹ Canada, Census, 1890-1, Vol. 3, p. iv.

² Bulletin 10, 1892, p. 3.

³ *ibid.*

⁴ *ibid.*

⁵ *Fourth Census of Canada 1901*, v, vi.

In the censuses of 1905 the definition of an industrial establishment was extended back to its pre-1900 meaning although inexplicably "many of the smaller ones [establishments] were not used in the compilation."⁶ In 1915 there was no limit placed on the number of employees that an establishment required to be considered "industrial" as opposed to a "workshop" but it had to produce \$2,500 worth of goods. Flour and grist mills, butter and cheese factories, fish canneries, sawmills, brick and tile yards, lime kilns and electric light plants were included regardless of the value of their output or number of employees.⁷ For the purpose of comparability however, after 1900 I have used the five employee minimum consistently and in 1915 have had no choice but to add the requirement of the minimum \$2,500 output, for all industries but the listed exceptions.

⁶ Canada, Census and Statistics Office, *Bulletin II, Manufactures of Canada*, (Ottawa: 1907) p. vi.

⁷ Canada, Census and Statistics Office, *Postal Census of Manufactures, 1916*, (Ottawa: 1917) p. i.

Appendix 2

Estimate of Under-enumeration Caused by Minimum Firm Size in 1901 and 1910

For the censuses of 1900 and 1910 the definition of an industrial establishment was changed from the previous censuses to exclude firms with less than five employees. This makes it difficult to compare the statistics from before 1900 to the census of that year. This appendix considers the extent to which the census of 1900 understates the amount of production in British Columbia as a result of excluding small firms.

The 1891 census did not distinguish between firms by number of employees but it did distinguish firms by categories based on value of production. If in 1891 we eliminated the two production categories of industries that had an average firm size of less than five employees (firms with output of less than \$2,000 and firms with output of between \$2,000 and \$12,000) we would have eliminated 70.4 percent of all firms but only 15.7 percent of production and 12.7 percent of employees.⁹ While the average firm size in these categories was below five employees, no doubt some firms had a work which exceeded the five necessary for comparison with the census of 1901. In 1901 there were 151 firms which employed five or more yet whose production did not exceed \$12,000 and thus fell into the same two production categories. These firms comprised 39 percent of the total number of firms, 11 percent of total employment and 5 percent of production.¹⁰ Assuming no change in the relative shares of production of firms employing less than five and no change in the relative share of firms producing \$12,000 or less worth of output, the 1901 census would underestimate total

Table 15
Average Employment Per Firm by Output Category 1890-1⁸

Output	# of Firms	% of Firms	# of Employees	Employees per Firm (Avg.)	% of all Output
Less than \$2,000	234	30.4	322	1.4	1.6
\$2,000 to \$12,000	307	40.0	1,137	3.7	14.1
\$12,000 to \$25,000	111	14.4	1,664	14.9	16.4
\$25,000 to \$50,000	59	7.7	2,296	38.9	17.9
Over \$50,000	59	7.7	5,988	101.5	50.0

⁸ Canada, Department of Agriculture, *Mechanical and Manufacturing Industries of Canada by Groups Special Report on the Census Returns*, Appendix to the Report of the Minister of Agriculture for 1894, Ottawa: King's Printer, 1895.

⁹ Canada, Department of Agriculture, *Mechanical and Manufacturing Industries of Canada by Groups Special Report on the Census Returns*, Appendix to the Report of the Minister of Agriculture for 1894, Ottawa: King's Printer, 1895.

¹⁰ *Canada Census, 1901* Vol. 3, Table XIX.

production by 10.7 percent.¹¹

Inwood & Chamard estimate that production by firms employing less than 5 in British Columbia in 1890-1 was 16% and assume no change in the share of "artisanal production" over the decade.¹² However, the percentage of output produced by firms with less than five employees appears to have been decreasing over time. According to the postal census of manufactures for the year 1905, firms employing under five people only produced 1.3 percent of total output and employed 1.1 percent of the total manufacturing employment in British Columbia.¹³ Bertram and Firestone have both taken the view that the share of artisanal firms, that is firms employing less than five, was declining in this period. Firestone estimates that in 1900 21.4% and in 1910 8.4% of production is excluded due to the change in enumeration. Bertram estimated that in 1900 the census underestimated production owing to this definition change by 12.22 percent, falling to 5.93 percent in 1910. Altman estimates that by 1910 only 2.7% of production was excluded by the revised definition.¹⁴

All the evidence suggests that the share of output from small firms in British Columbia was well below the national average. If we assume with Bertram and Firestone a declining share of artisanal production then it seems that a reasonable approximation of the underestimation of output, due to the decision not to count firms of less than five employees would be in the range of 8 to 10 percent for British Columbia in 1900 and in the range of 2 to 6 percent in 1910.

11

15.7% of production (1890-1) by firms producing less than \$12,000.
- 5% of production (1901) firms of over 5 employees but producing less than \$12,000

10.7% of production by firms of under 5 employees (producing less than \$12,000)
and therefore not included in 1901 enumeration.

This probably exaggerates the underestimation because the share of production of firms of under five employees and of firms producing less than \$12,000 appear to have been declining (see below).

¹² Inwood & Chamard, "Missing Artisans," pp. 107-109.

¹³ See: Census and Statistics, *Bulletin II. Manufactures of Canada, (1906)*, (Ottawa: King's Printer, 1907)

¹⁴ Gordon W. Bertram, "Historical Statistics on Growth and Structure of Manufacturing in Canada, 1870-1957," *Canadian Political Science Association Conference on Statistics, 1962 and 1963, Papers*, p. 99; O.J. Firestone, *Canada's Economic Development, 1867-1953*, (London: 1958), pp. 291-2; M. Altman, "Comparative Economic History of Quebec and Ontario, 1870-1910," Ph.D. Dissertation, McGill University, 1984, vol. 1, p. 53.

Appendix 3 Output Estimates of Firms in 'All Other' Category 1901-1911

For the censuses of 1881 and 1891 no estimates were needed as each industry that was present in a census district was listed with complete statistics regardless of the number of firms in that industry in any district.

In order to protect the confidentiality in the censuses of 1901 and 1911 industries with less than three establishments in any tabulation unit (ie. district, province, Canada), were all lumped together in an "All Other" category. In some instances the province's largest firms (like B.C. Sugar) fell into this category. Fortunately, with some of these industries, the confidentiality provided was more apparent than real -- it is possible to calculate the missing B.C. figures by subtracting the published industry totals for all the provinces, except B.C., from the Canadian total.

However, in cases where other provinces beside British Columbia had less than three firms in an industry it is not evident how much of the production accounted for by provinces with less than three firms in an industry is attributable to British Columbia. In these cases the only information the census published was the number of firms in each province having less than three firms. It is possible to derive the total output, employment, etc.... that these firms collectively accounted for by subtracting the data for provinces having 3 or more firms in that industry from the Canadian total. In these cases estimates were made to proportion British Columbia's share of the residual output of the industry produced in the provinces which had less than three firms in the industry.

Four different estimation techniques were used depending on the type of industry, ie. whether it served only a regional market or an extra-regional market, and on the availability of comparable data from other sources. Method One was to find published figures for employment, output or value added for the census year in question from other government reports. Because the censuses of 1901 and 1911 were based on manufacturing production for the 1900 and 1910 calendar years comparable data is often available. Thus the production statistics of cement or brick production were obtained from the *Annual Report of the British Columbia Minister of Mines 1910, 1911 in B.C. Sessional Papers*. The number of employees were then estimated from the census residual employment figures by multiplying them by the ratio of the output of the British Columbia firms to the output of all provinces with less than three firms in the industry. In a similar manner the number of employees in the British Columbia firms for 1910 were obtained from the *Report of the Inspector of Factories, 1910, B.C. Sessional Papers, 1911*, and were used to proportion output.

The remaining industries which could not be allocated in this way were allocated to one of two categories. Category One was comprised of those industries which seldom sold their product inter-provincially. Industries in this category, for example, included: ice making, monuments & tombstones, and tent and awnings. The residual output for these industries were allocated to the provinces with less than three firms in the industry according to their population size regardless of whether there were one or two firms in that province (Method 2).

The third estimation technique was applied to industries in Category Two, industries which sold their product extra-provincially, for examples sugar refining, rice milling, and vinegar making. In these cases output and employment were allocated to the each province in proportion to the number of firms in the province.

Finally there were a few industries in which 1 or 2 British Columbia firms produced the total Canadian output so there is no way to calculate their output from that given census. A fourth technique estimated the output for these industries by

deflating or inflating the output of that industry from the census chronologically closest to the year in question which did publish output for that industry. The provincial growth rate for manufacturing for the intervening period was used as the inflator or deflator (ie. the 1915 output of wooden pipe manufacturing was deflated by the growth rate of British Columbia manufacturing 1910-1915 to provide an estimate for the 1910 output). This technique was used only in a few cases.

In 1901 22.1 percent of British Columbia's manufacturing output was accounted for by industries in the "all other" category and thus had to be estimated. Method 2 accounted for 3.2 percent of the total; Method 3 for 17.1 percent; a further 1.8 percent of the total output was estimated by Method 4. Estimated output figures for 1911 accounted for 10.7 percent of total manufacturing output, respectively, Method 1, 0.7 percent Method 2, 1.6 percent Method 3, 7.5 percent; a further 0.9 percent of the output was estimated by Method 4.

Appendix 4 Industries Enumerated in British Columbia by Category

The industry categories used in this thesis is adapted from that proposed by James Gilmour¹⁵ which in turn is based on the work of J.H. Dales.¹⁶ These categories have the advantage over the 1949 standard industrial classifications because they are designed to accommodate the structure of pre World War One industry.

I have reviewed Gilmour's classifications and have made the following alterations:

a) Tobacco Processing was removed from the Primary industry category and placed with Consumer Food, Drink and Tobacco category. In Ontario Tobacco is an Extractive Industry. In British Columbia, on the other hand, where little tobacco is grown, tobacco processing more properly belongs in the consumer category where it should be considered interchangeable with Gilmour's Tobacconist and Cigar Making category.

b) I have allocated Opium Manufacturing to the Consumer Food, Drink and Tobacco category from of the Finished Producer Good where Gilmour has placed it. Smelting has been moved from the unfinished goods category of the producer goods sector to the unfinished category of primary manufacturing. Finally I have moved sail making from consumer semi-durables and boat building from consumer durables and placed them in the finished producer: investment goods sector, because evidence suggests that most of the products from these industries, in B.C. were sold to the fishing and transportation industries.

c) While Gilmour and Dales have split some industries between different manufacturing categories according to percentages of output sold in different markets, I have chosen the single most important category of theirs and allocate the whole of the industries output to that category. This should not distort the data significantly because i) their assignments to different categories were based on "educated guesses" and ii) most of the time they allocated 80 per cent or more of an industry's output to a single category iii) this is well within the margin of error of their educated guesses and iv) this apportionment affects relatively few industries and v) the apportionments across commodity industries will tend to cancel themselves. By avoiding this somewhat haphazard apportionment we simplify the analysis considerably.

¹⁵ James Gilmour, in *Spatial Evolution of Manufacturing: Southern Ontario, 1851-1891* (Toronto: University of Toronto, 1972) pp. 196-204.

¹⁶ J.H. Dales, "Estimates of Canadian Manufacturing Output by Markets, 1870-1915," *Papers*. Canadian Political Science Association, Conference on Statistics 1962 and 1963.

Industries Enumerated in British Columbia in
Canada Census 1881, 1891, 1901, 1911 by Industry Category
(Revised Dales-Gilmour)

20) Consumer Goods	Gold & Silver Smithing
	Potteries
21) Consumer Food and Drink	Saddle & Harness Makers
	Watchmakers & Jewellers
	Woolen Mills
Aerated Water Making	
Bakeries	25) Consumer Durables
Baking Powder & Flavouring Extracts	Cabinet & Furniture Makers
Bread, Biscuit, & Confectionary	Carriage Making
Breweries	Coffin & Casket Makers
Cigar Making	Furniture and Upholstery
Coffee & Spice Mill	Gun Making
Confection Making	Gunsmithing
Flour and Grist Mill	Incubator Factory
Liquors-Malt	Locksmithing
Meat Curing	Mattress Making
Opium Manufacturing	Monuments and Tombstones
Rice Cleaning & Polishing	Musical Instrument Making
Slaughter & Meat Packing	Trunk & Box Making
Sorghum Syrup Factories	
Sugar Refinery	30) Finished Producer Goods
Tobacco Working	
Vinegar & Pickles	31) Fin. Producer Construction Materials
22) Consumer Sundries	Glass
Broom & Brush	Glass, Stained, Cut, Ornamental
Chemical Establishments	Lumber Products
Fish Oil Refining	Metallic Roofing & Flooring
Interior Decorations	Mirror & Plate Glass
Match Factories	Paint & Varnish
Miscellaneous Wares	Planing & Moulding
Oil Refineries	Plumber's Supplies
Photographic Galleries	Roofing & Roofing Materials
Printing and Publishing	
Soap & Candle Making	32) Fin. Producer Supplies to Primary & Secondary Industry
23) Consumer Clothing & Footwear	Artificial Ice
Boot & Shoe Making	Awning Tent and Sails
Dressmaking & Millinery	Blacksmiths
Clothing	Drugs
Furnishing Goods	Explosives
Furriers & Hatters	Fertilizers
Hosiery Manufacturing	Gunpowder Mills
Tailors & Clothiers	Rope & Twine Making
Wig Making	Saws
24) Consumer Semi-Durables	

33) Fin. Producer Investment Goods

Boat & Canoe Building
 Boiler Making
 Boilers & Engines
 Car (Railway) Repairs
 Carpenters & Joiners
 Engine Building
 Foundries & Machine Works
 Housebuilding
 Painters & Glaziers
 Patterns
 Plaster & Stucco
 Plumbers & Gasfitters
 Plumbers & Tinsmiths
 Pulleys
 Rolling Stock
 Sail Making
 Sash, Door & Blind Factories
 Shipyards
 Showcases
 Wooden Pipes

40) Unfinished Producer Goods

Bookbinding
 Boxes and Bags
 Boxes, Wooden
 Brass Casting
 Coke
 Cooperage
 Dyeing & Scouring
 Dyeing and Cleaning
 Electrical Apparatus & Supplies
 Fittings & Foundries (Brass)
 Iron and Steel
 Leather, Tanned, Curried & Finished
 Printing & Bookbinding
 Rubber Factory
 Ship Material Making
 Tanneries
 Tin & Sheet Iron
 Tinsmithing
 Woodturning
 Woodworking and Turning

50) Primary Manufacturing

51) Primary Food & Drink

Butter Factories
 Cider Making
 Cheese Factories

Condensed Milk

Fish Canning
 Fish Curing
 Fruit & Vegetable Canning
 Hops, Pressed
 Preserved Articles of Food

52) Primary Construction

Asbestos
 Brick, Tile & Pottery
 Cement Blocks & Tiles
 Lime Works
 Log Products
 Portland Cement
 Saw mills
 Shingle Making
 Stone & Marble Cutting

53) Primary Unfinished Producer Goods

Charcoal Burning
 Pulp Mills
 Smelting Works

Appendix 5 Sources for Tables 1 and 2

The Colony of Vancouver Island instituted a business tax in 1860 based on the declared income for the three months prior to the assessment. The assessments were made and taxes levied twice annually 1860-1866. The 1860 figures here represent income declared for the purpose of income tax levy, and as a result must be underestimates of actual production, for two three-month periods (April 1 to June 30 and October 1 to December 31, 1860) and are doubled to give an estimate of the annual production. The figures are declared in pounds but are converted here at the rate of \$5 to 1 to allow comparison to eastern Canada. In 1861 the official government rate in the colony of British Columbia was set at \$4.85 to 1 pound sterling but previous to this and for years afterwards the pound passed at \$5 in the colonies. The rate was not officially set by statute in Vancouver Island until January 1, 1866 when it was also set at \$4.85.

After 1862 the merchants were asked to declare their six month sales and so the 1865 annual estimate is double the six month sales reports. For the Tax Assessment Roll see, "Supplement to the *Daily British Colonist*," February 2, 1861 and May 8, 1861; Colony of Vancouver Island, *Extra Government Gazette*, vol. II, no. 40, (September 1 1865) and *British Colonist*, October 25, 1862, p. 3. For conversion rate see *Ordinance No. 8 of the Legislative Assembly of Vancouver Island; the British Columbian*, December 21, 1861; and, Howay, Sage, Angus, *British Columbia and the United States*, pp. 171-3. For the Trades' Licence Act see "An Act to Impose Certain Duties in Respect of Certain Trades and Occupations, 1860," *A Collection of the Public General Statutes of the Colony of Vancouver Island Passed in the Years 1859, 1860, 1861, 1862, and 1863*, Victoria: Evening Express, 1864.


For the purposes of a rough comparison to the secondary manufacturing of Upper Canadian towns of the time, the building, and many of the hand trades including brewers, bakers, bootmakers, etc. have been removed from the figures for Victoria in column IV of Table 2 as these were not included in the Canadian Census of 1861. To compare the secondary sectors the flour milling and sawmilling contribution has been removed from the totals in column IV and as Toronto and Hamilton declared neither of these industries their totals are unchanged between columns. The figures are derived from two different sources and collected for different purposes, moreover neither record is complete. No attempt was made to estimate the missing output statistics either for the Upper Canadian census or the Victoria tax assessments. Victoria data is from 1860 income estimates for manufacturers and is based on the Trade License assessments (above). Upper Canadian figures from *Census of the Canadas, 1860-61*, Vol. II., Quebec: S.B. Foote, 1864. Both sets should be regarded as underestimates on the grounds that, first, in neither case does every firm report its output and second, due to the association of the data collection with taxation. Victoria population is from *Daily British Colonist*, June 12, 1860, and is an approximation only.

Appendix 6

Output of Selected British Columbia Industries, 1880-1915

The following Tables A-1 to A-24 are the production statistics from those industries that appear in three or more of the censuses between 1880 and 1915 and provide an indication of changing levels of output over time. The figures for 1900, 1905, 1910 and 1915 are for firms with five employees or more. The effect of this definition shift is discussed in Appendices 1 and 2. The output is consistently expressed in current dollars and the effect of this on the interpretation of changing output over time is discussed in Appendix 7.

Where reliable estimates are available they have been added to the production statistics directly provided by the census. The estimation techniques are the subject of Appendix 3.

Data directly from the census is connected by 


Data that has been estimated is connected by 

Figure A-1

Production of Log Products (saw & shingle mills)
in Millions of Current Dollars

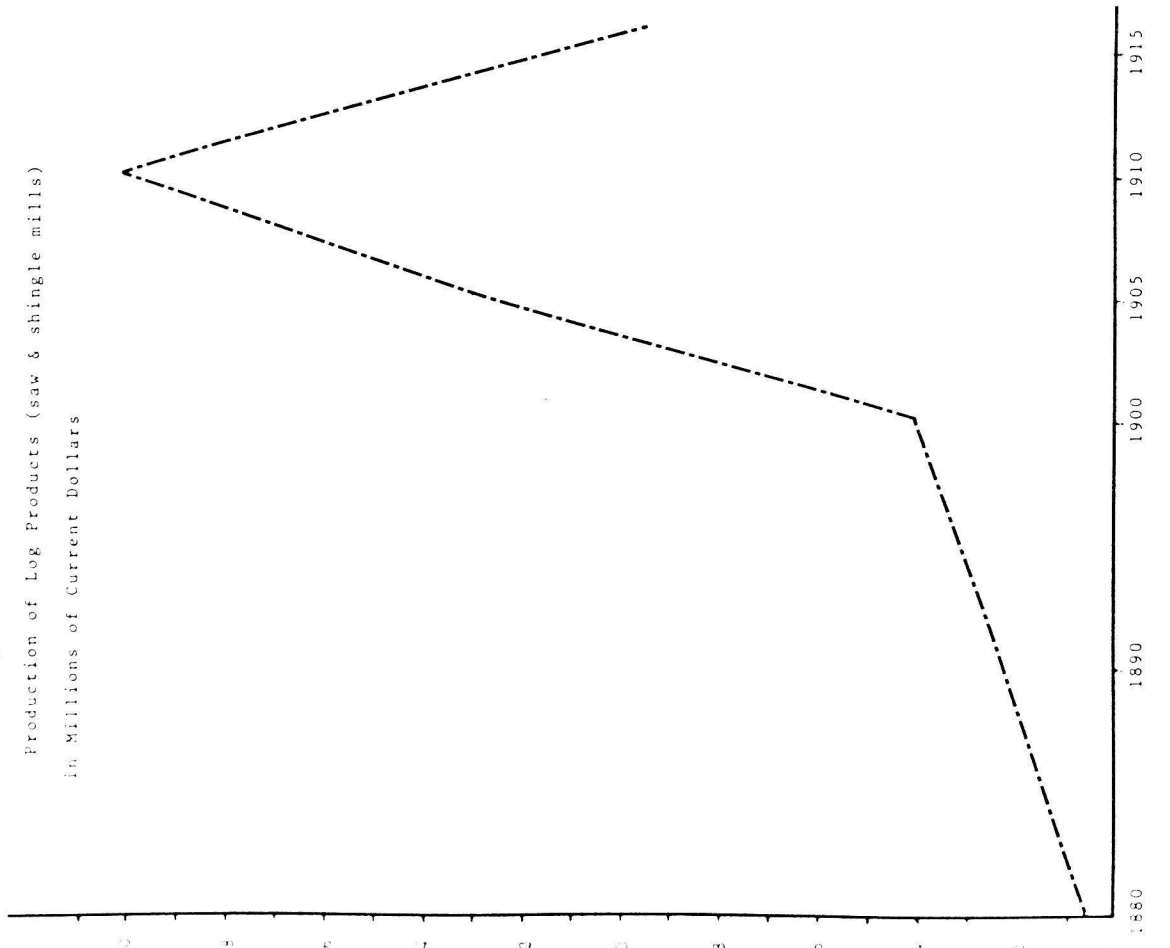


Figure A-2

Production of Smelting Industry
in Millions of Current Dollars

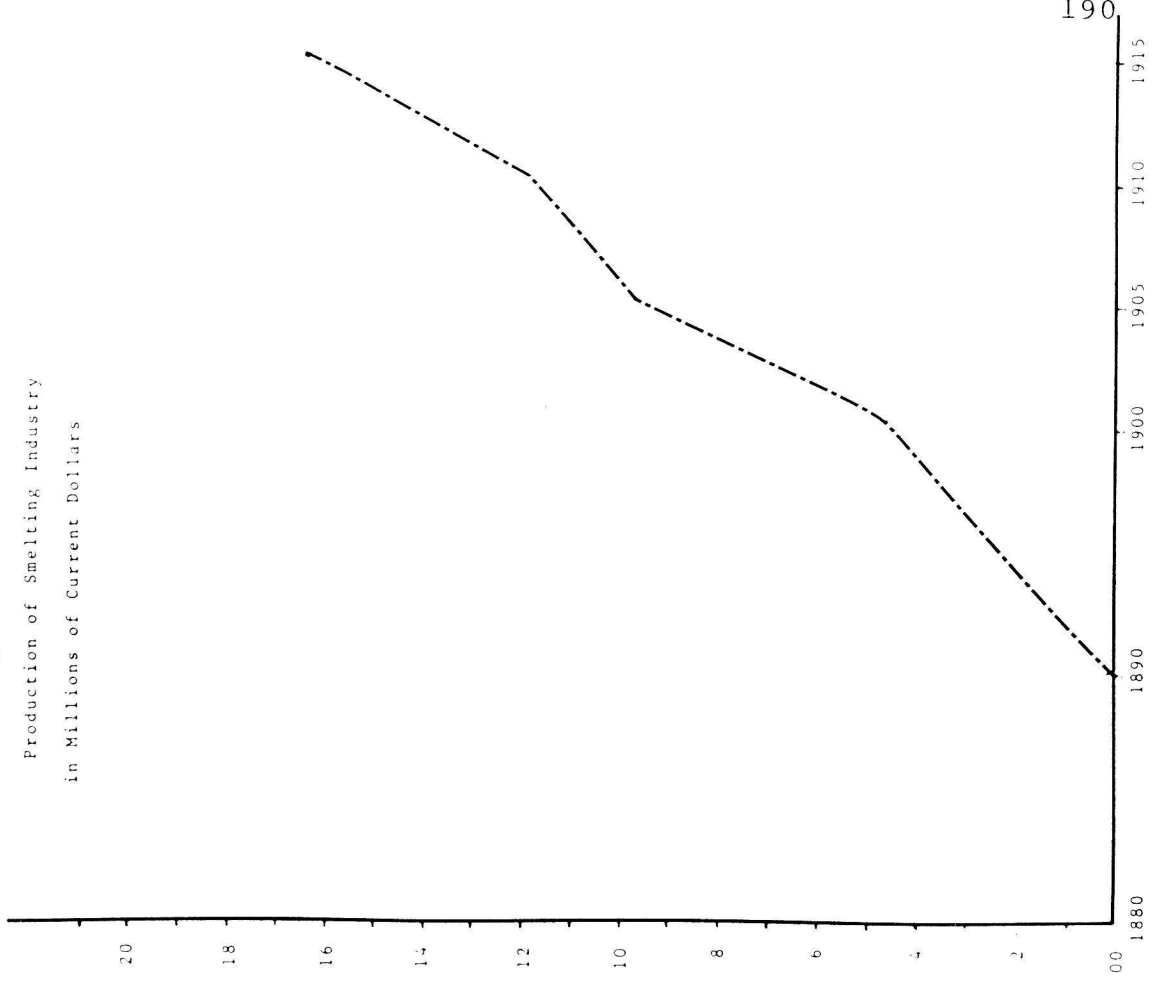


Figure A-3

Production of Fish Canneries
in Millions of Current Dollars

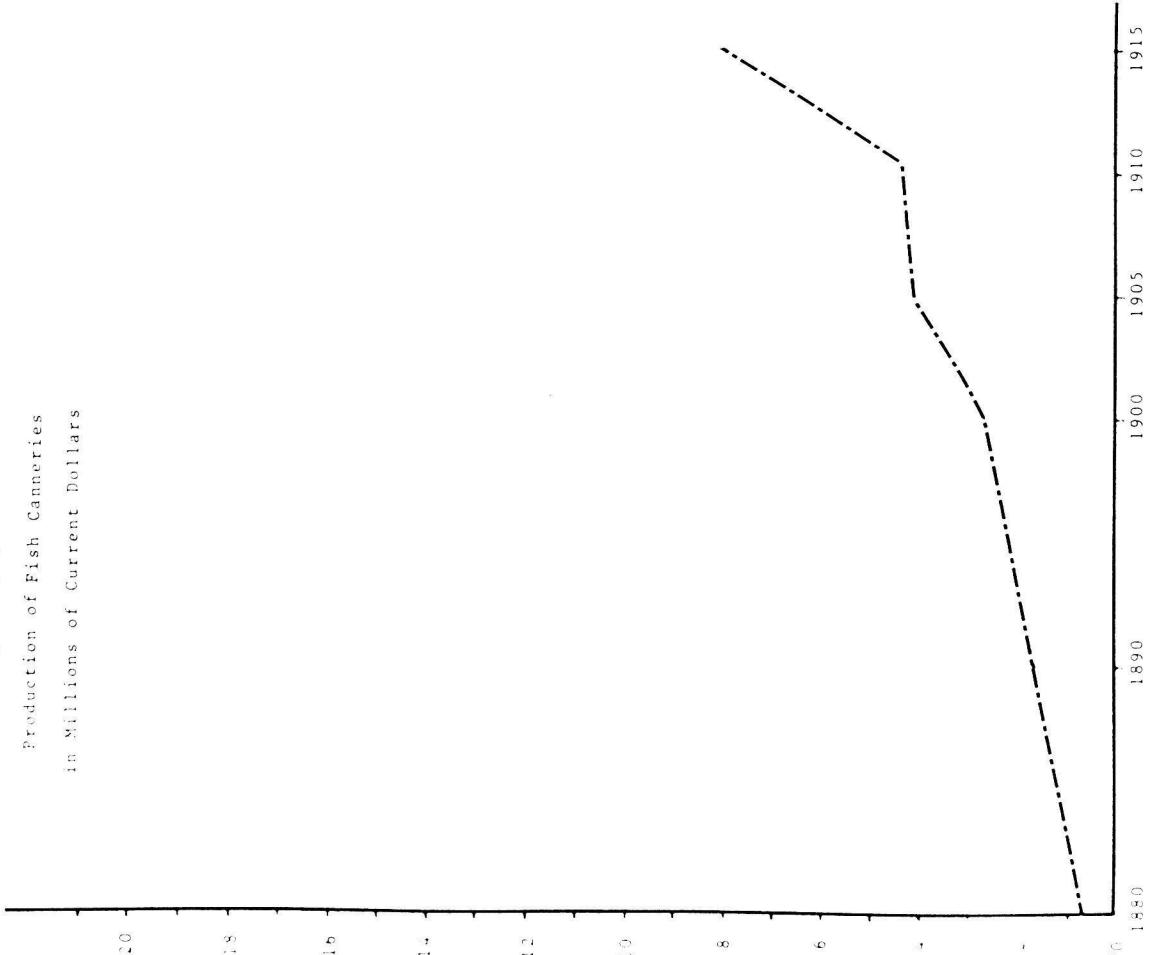
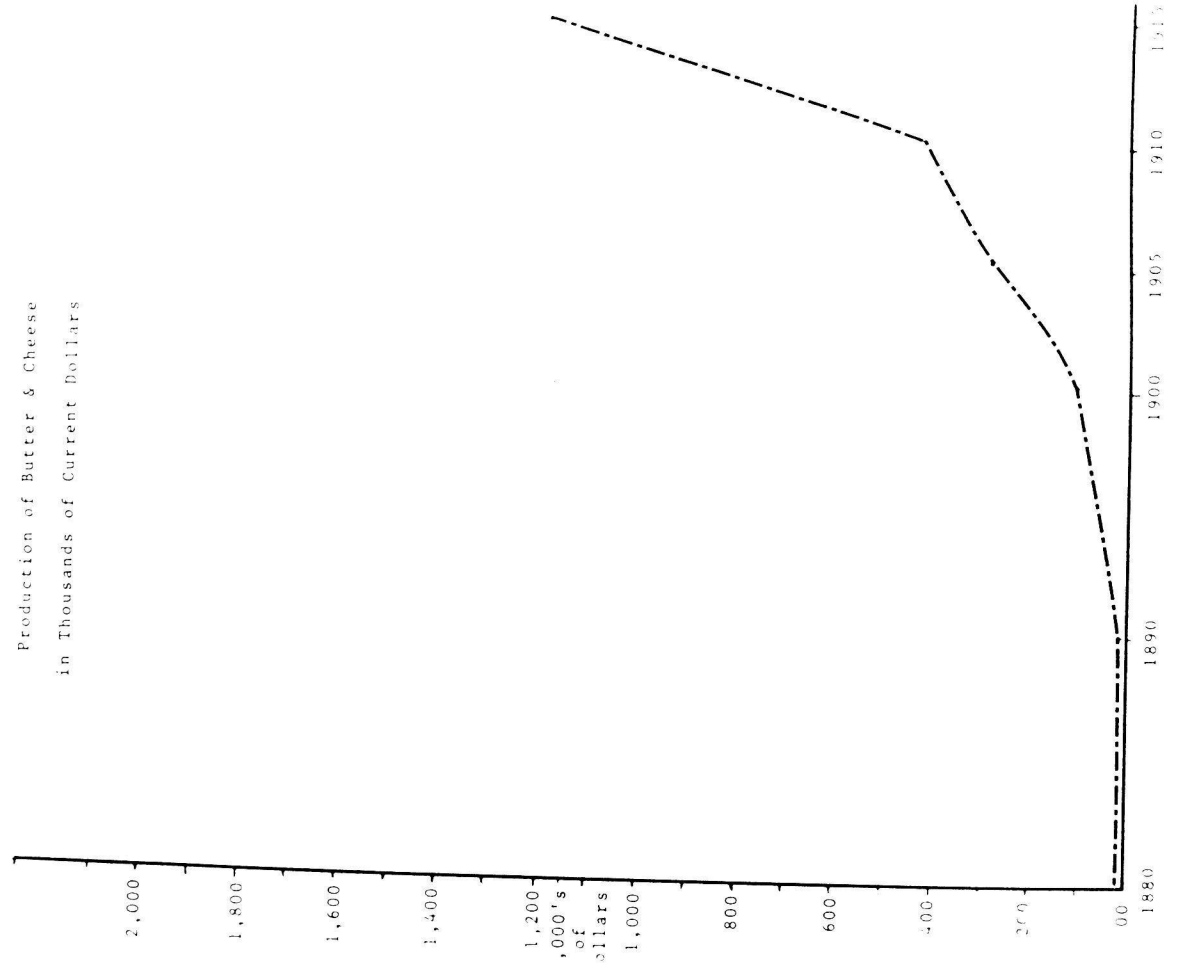


Figure A-4

Production of Butter & Cheese
in Thousands of Current Dollars



3,827,237

Figure A-5
Production of Lumber Products
in Thousands of Current Dollars

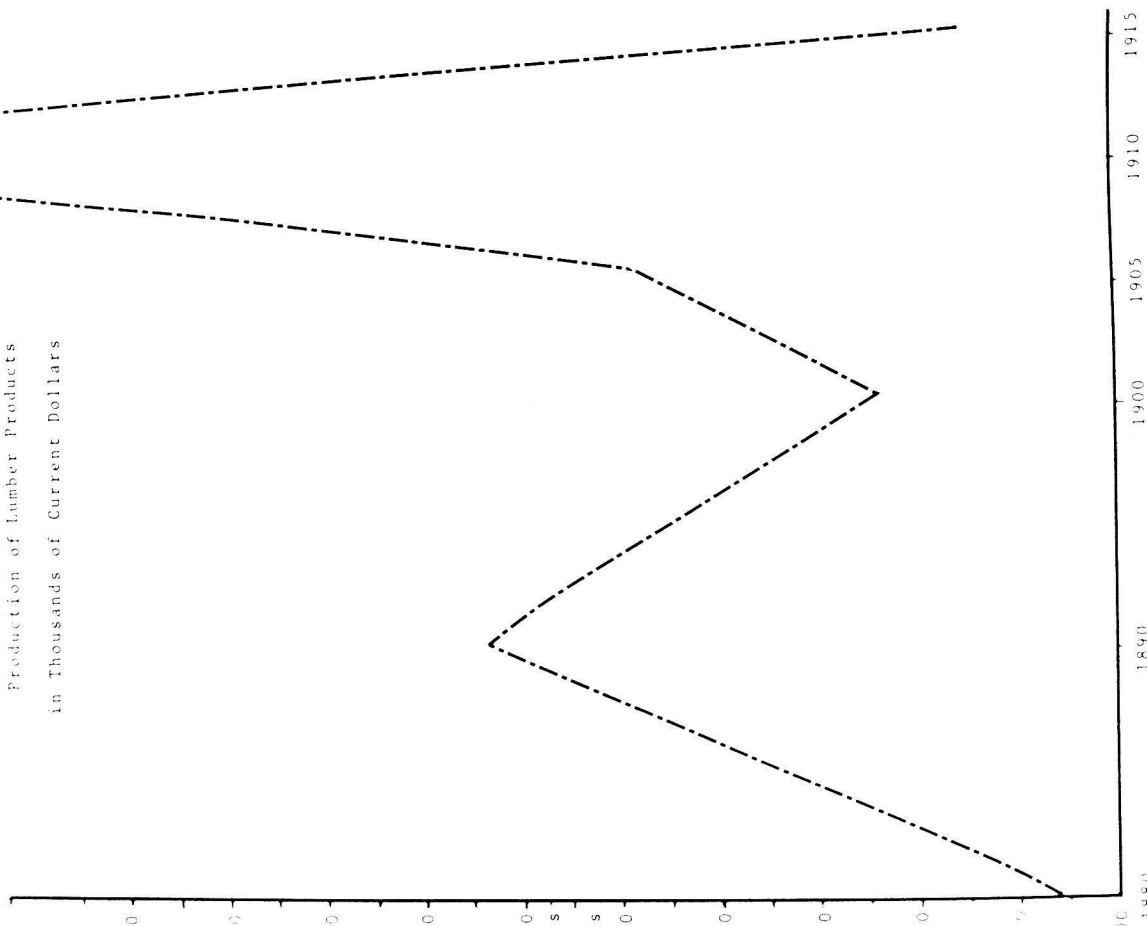
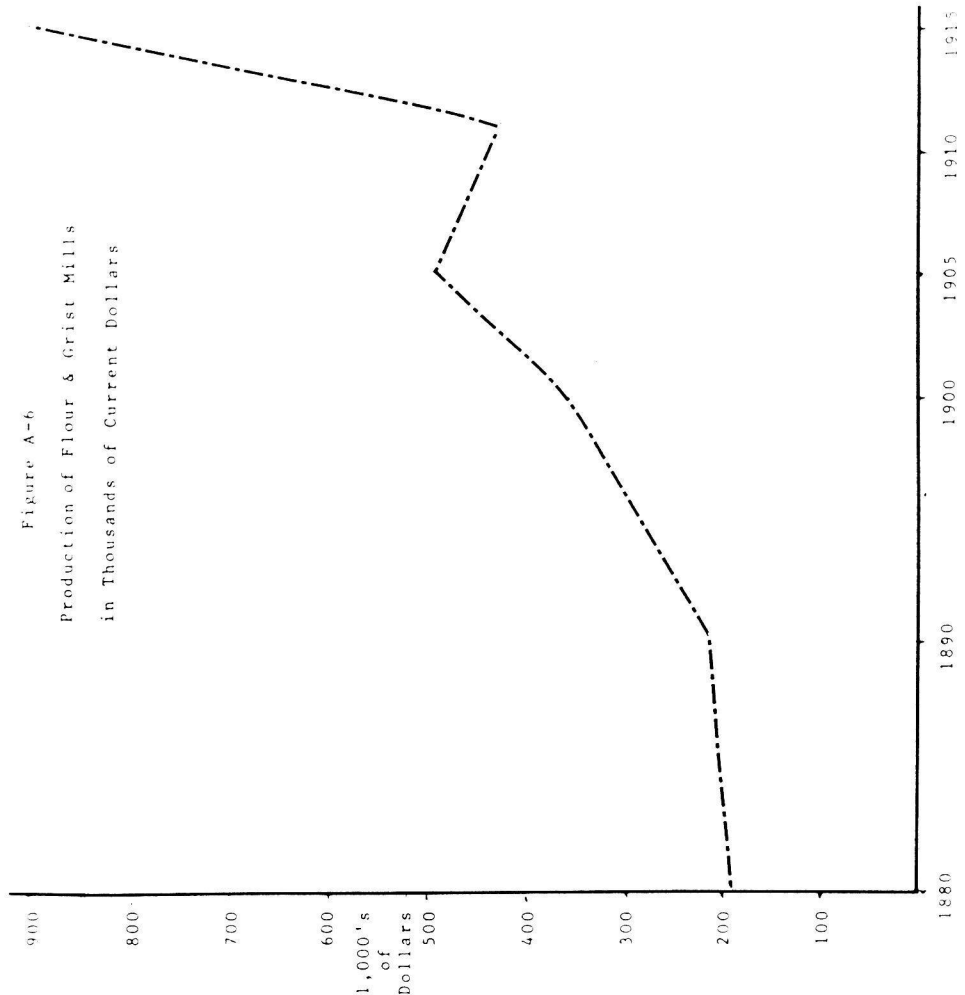


Figure A-6
Production of Flour & Grist Mills
in Thousands of Current Dollars



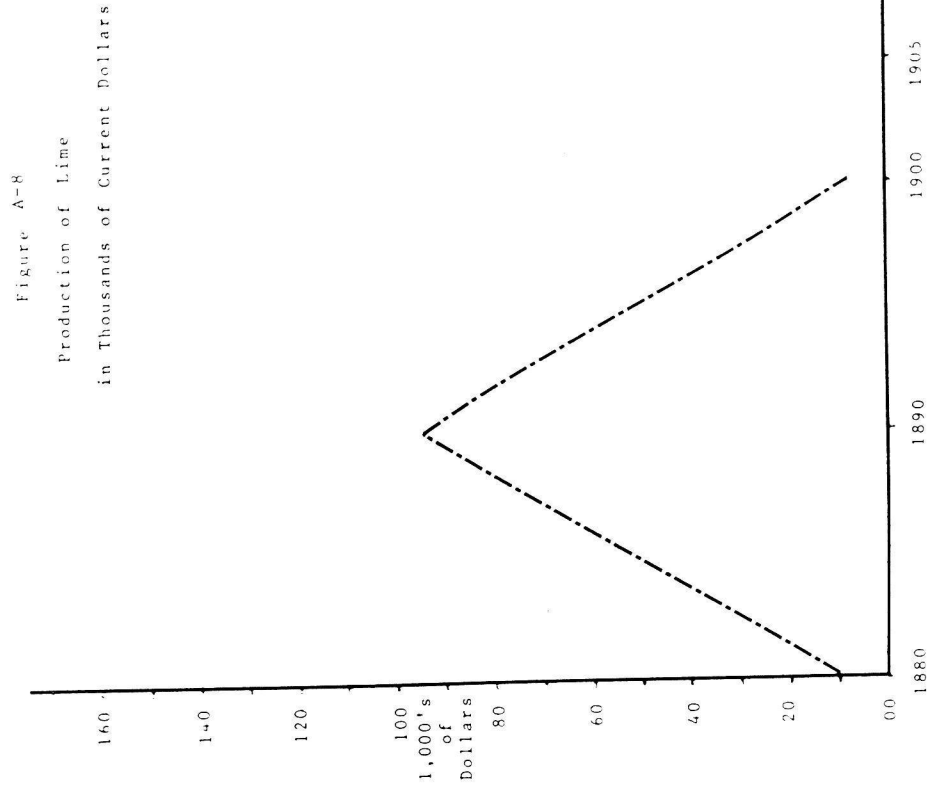
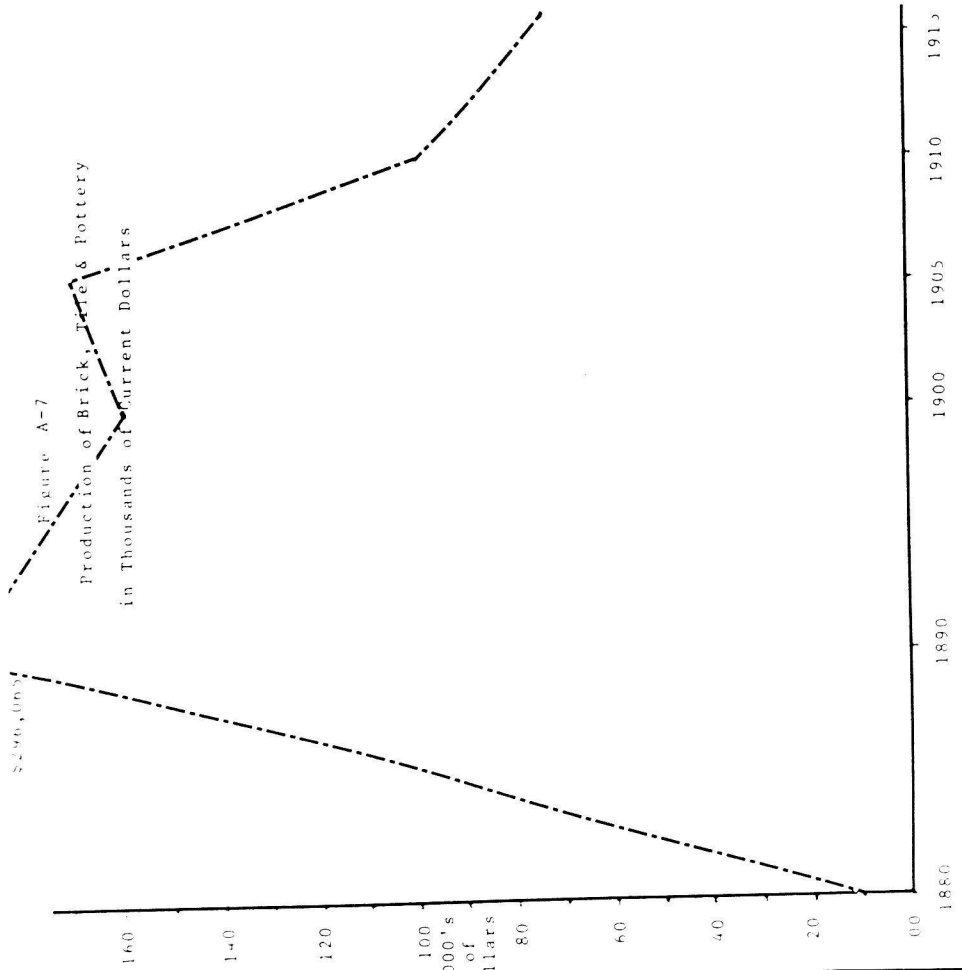


Figure A-9

Production of Malt Liquor & Liquor
in Thousands of Current Dollars

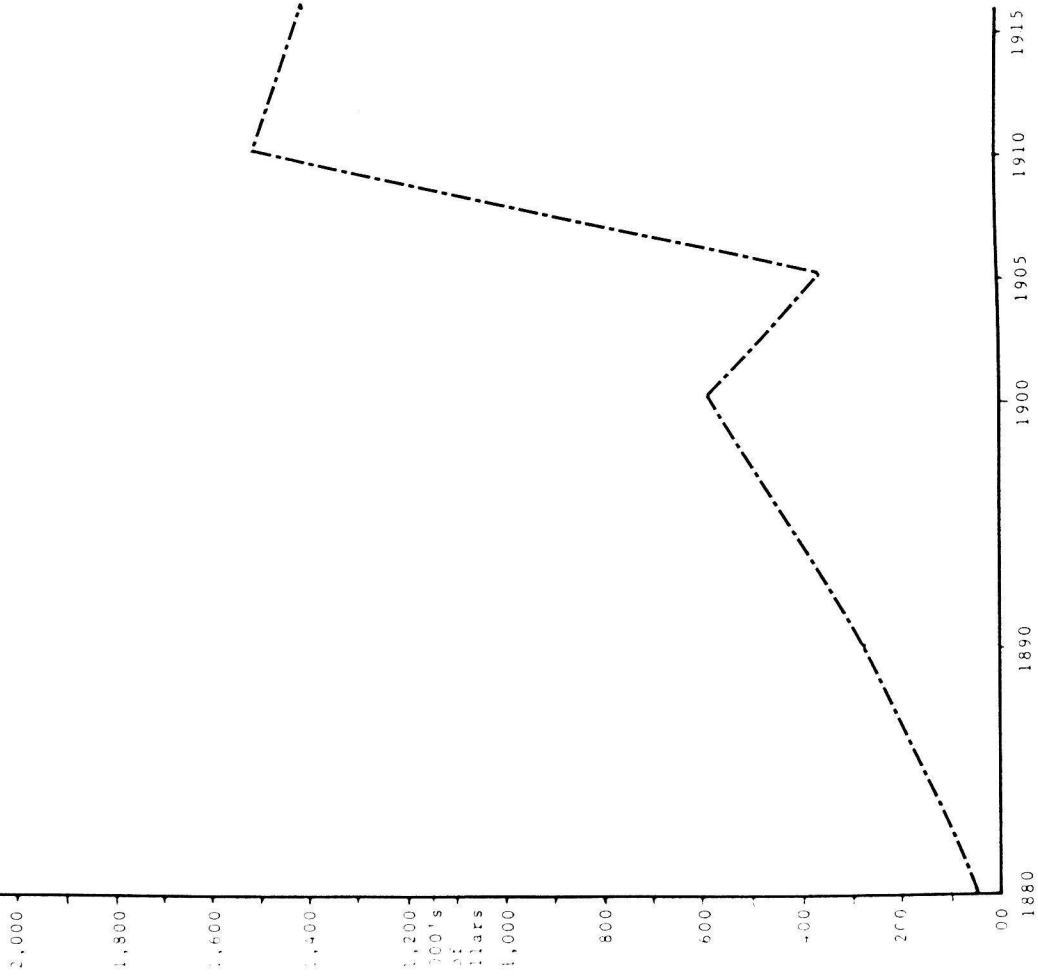


Figure A-10
Production of Cigars & Tobacco Products
in Thousands of Current Dollars

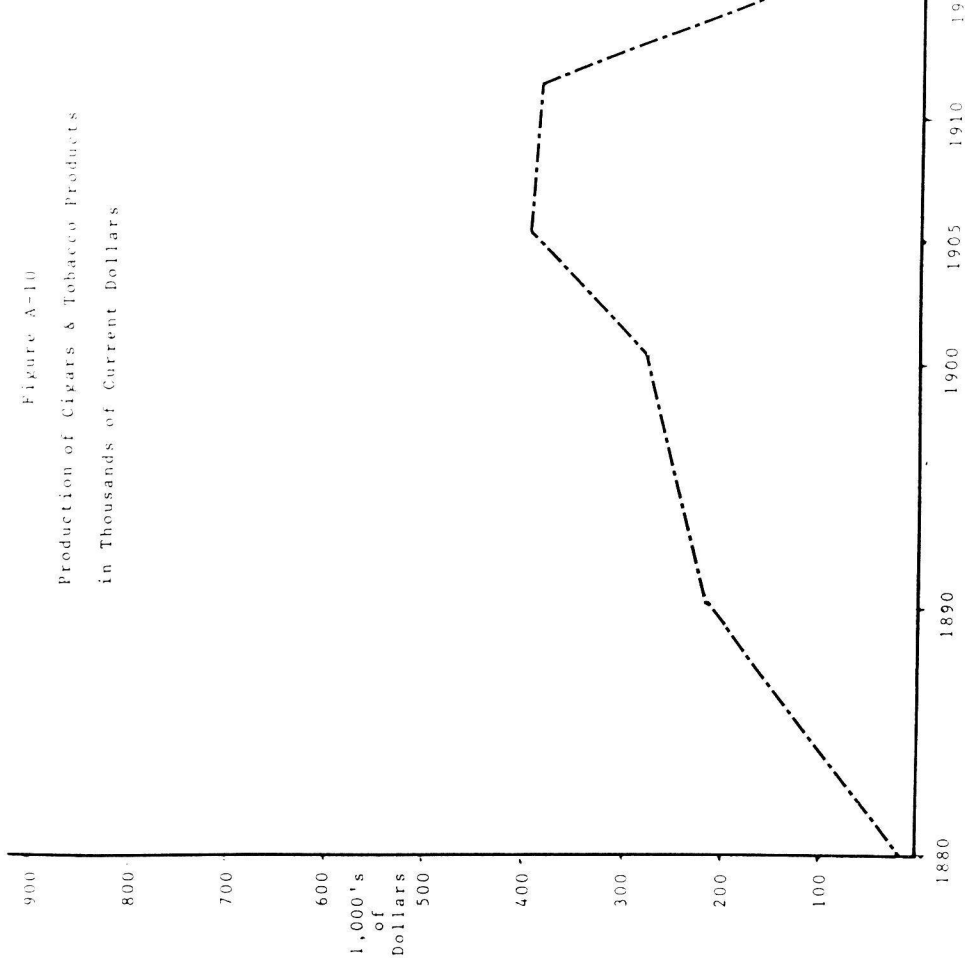


Figure A-11

Production of Bakeries
in Thousands of Current Dollars

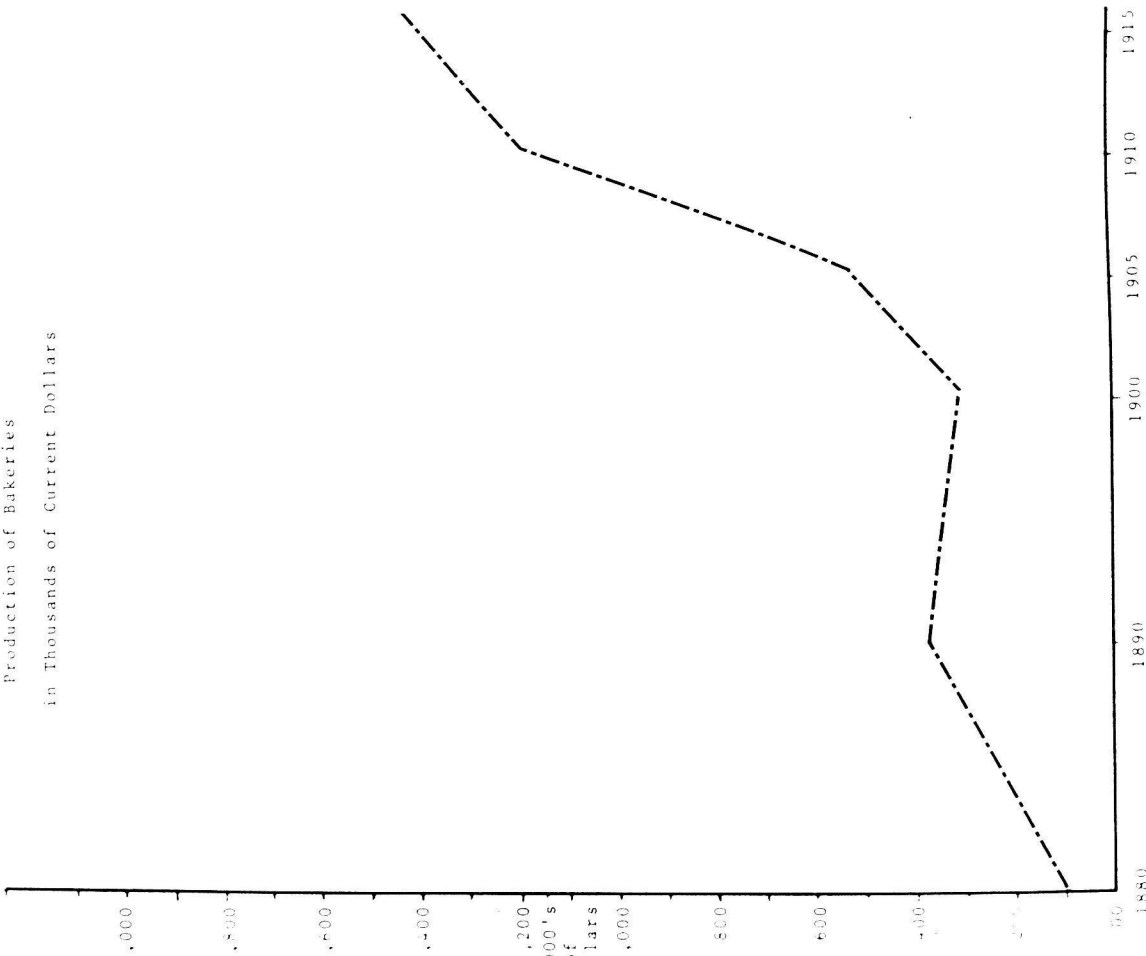


Figure A-12

Production of Aerated/Mineral Water
in Thousands of Current Dollars

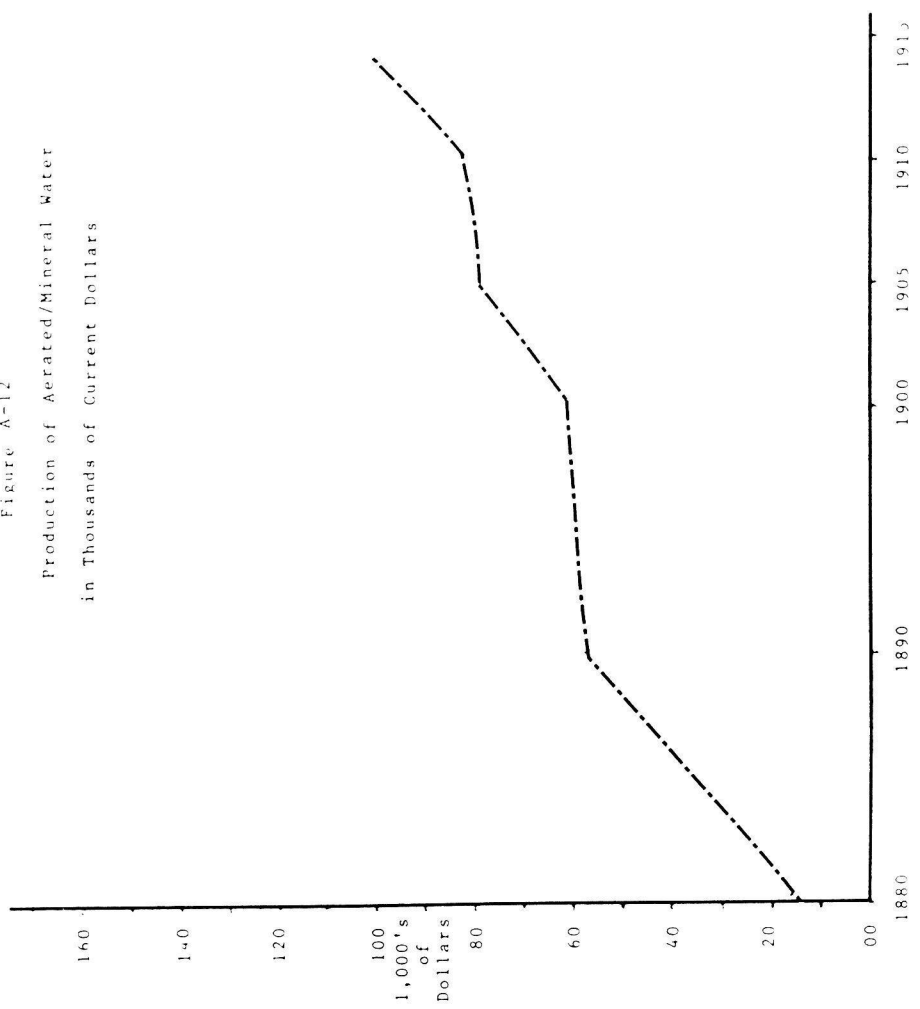


Figure A-13
 Production of Printers/Publishers
 in Thousands of Current Dollars

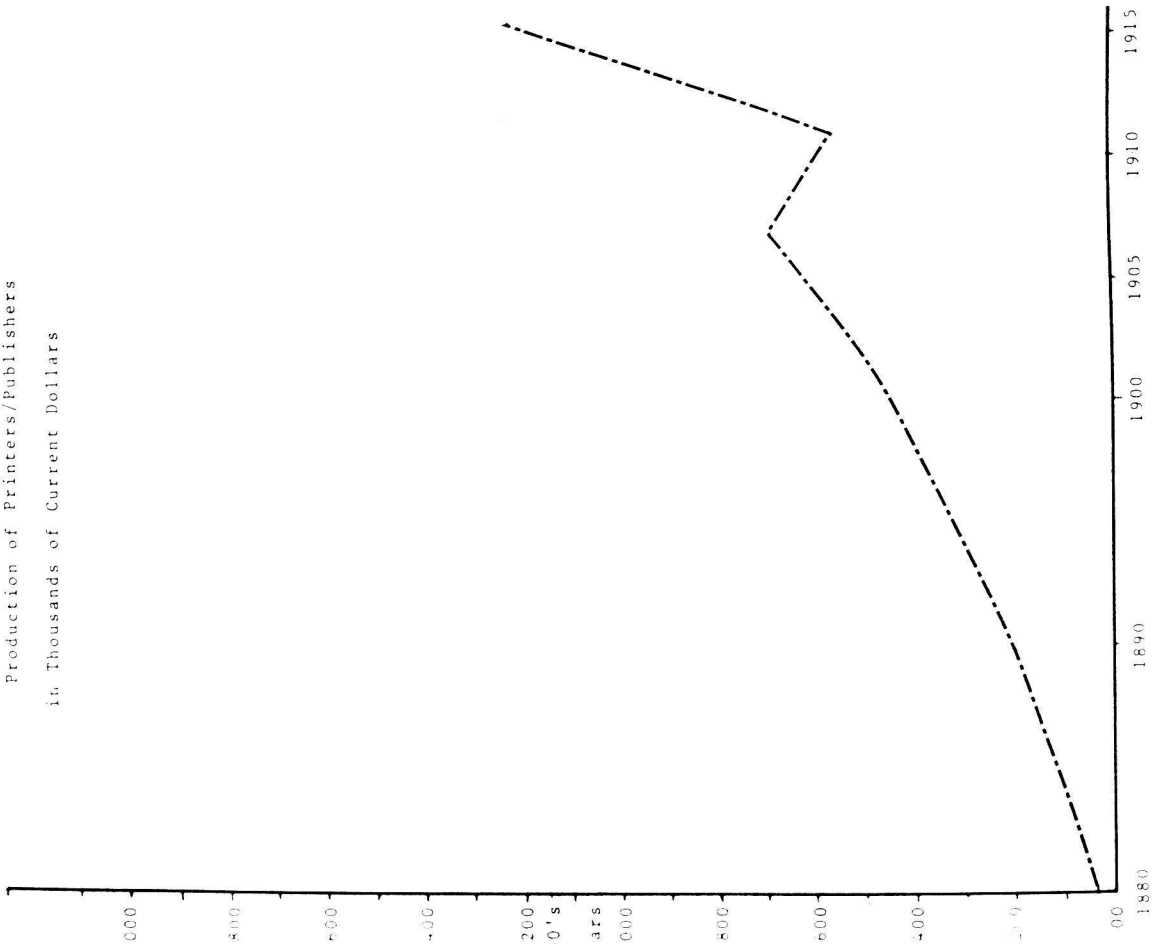
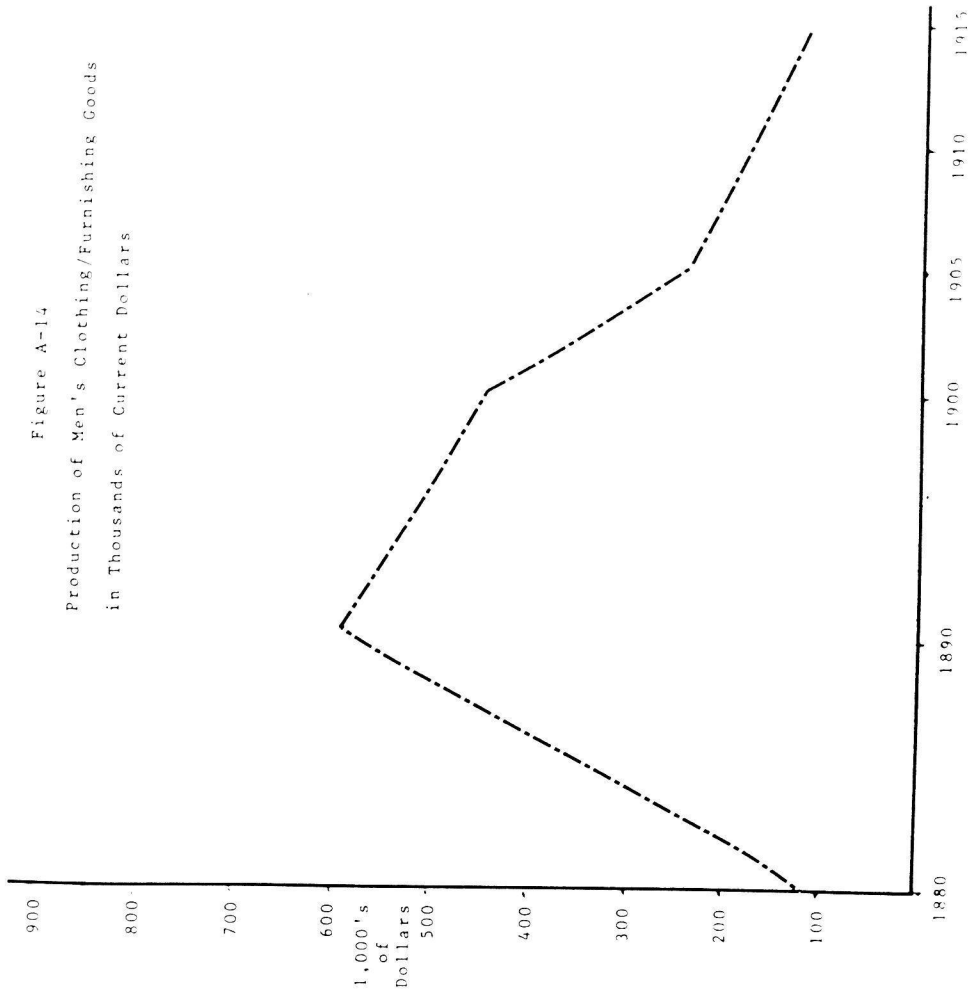


Figure A-14
 Production of Men's Clothing/Furnishing Goods
 in Thousands of Current Dollars



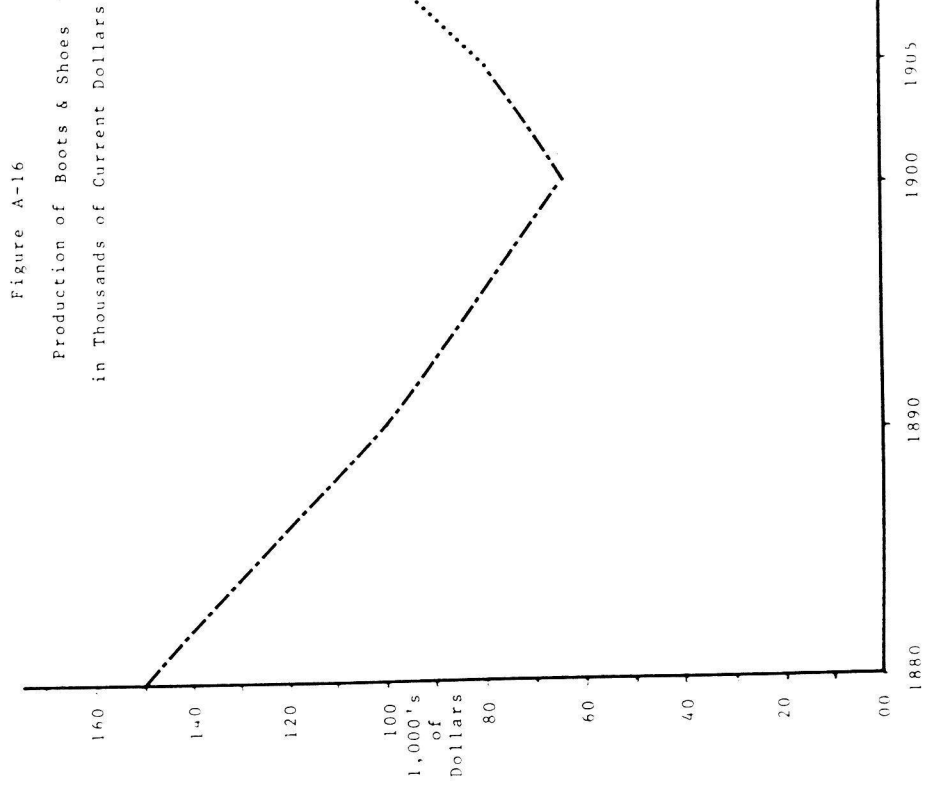
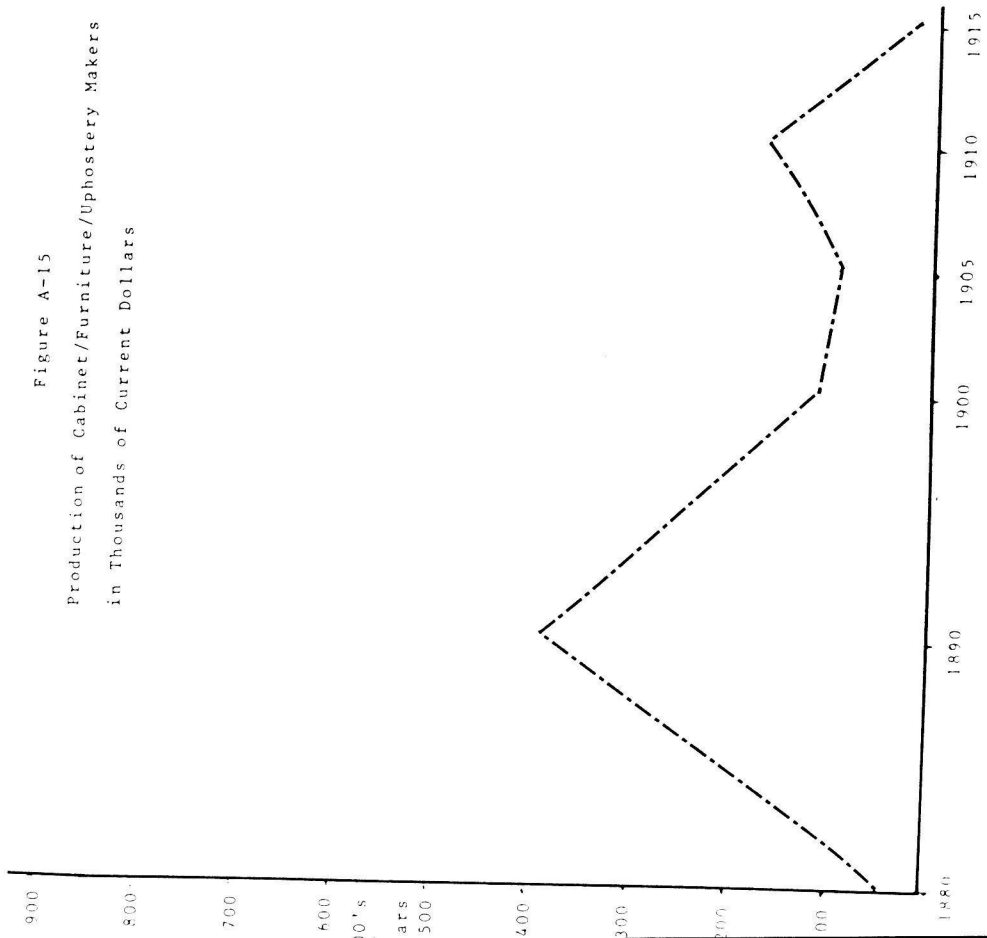


Figure A-17

Production of Carriages/Waggonss
in Thousands of Current Dollars

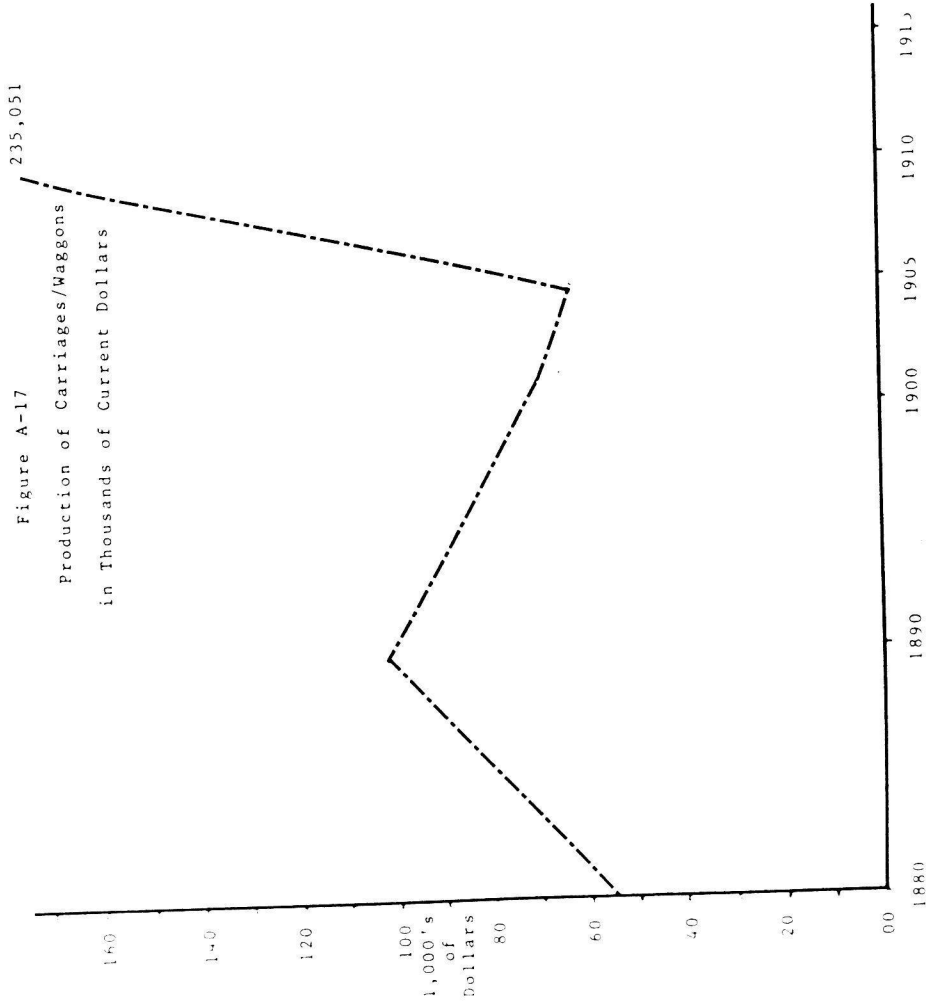
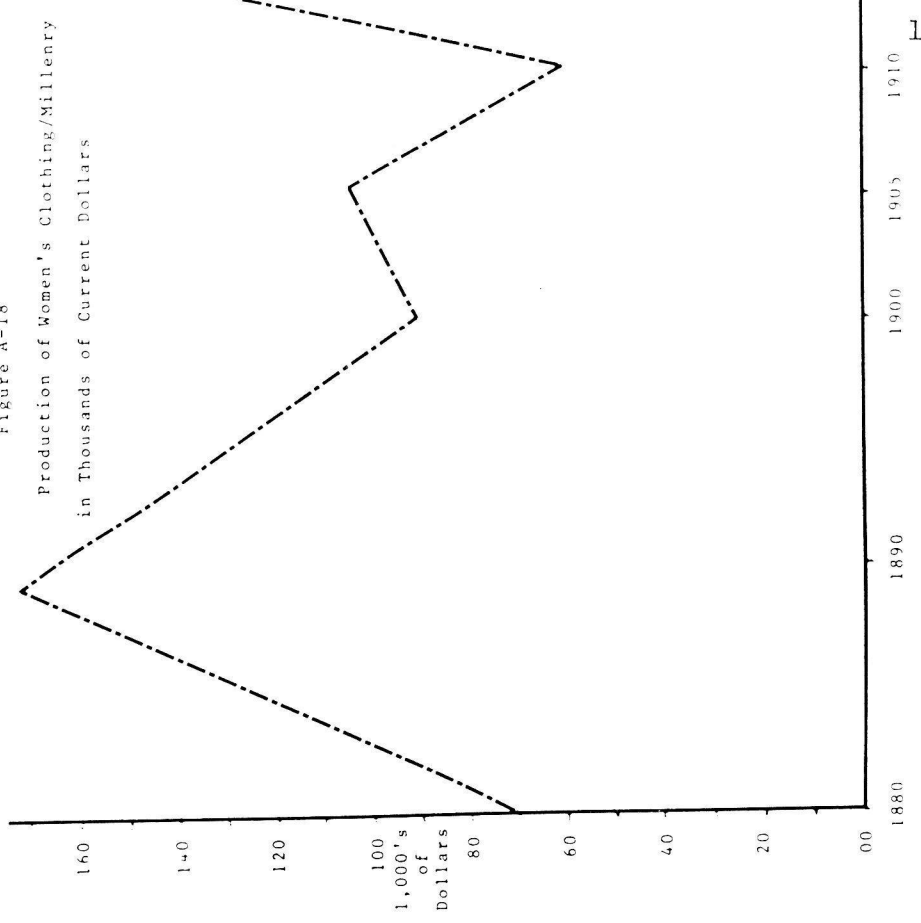


Figure A-18

Production of Women's Clothing/Millenary
in Thousands of Current Dollars



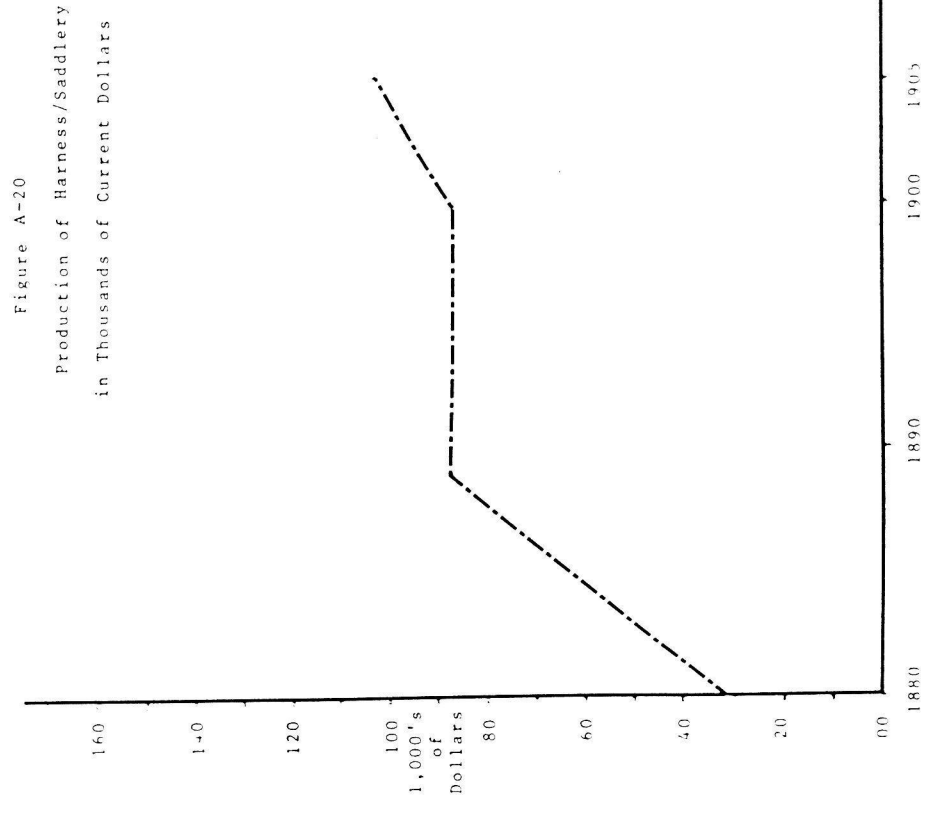
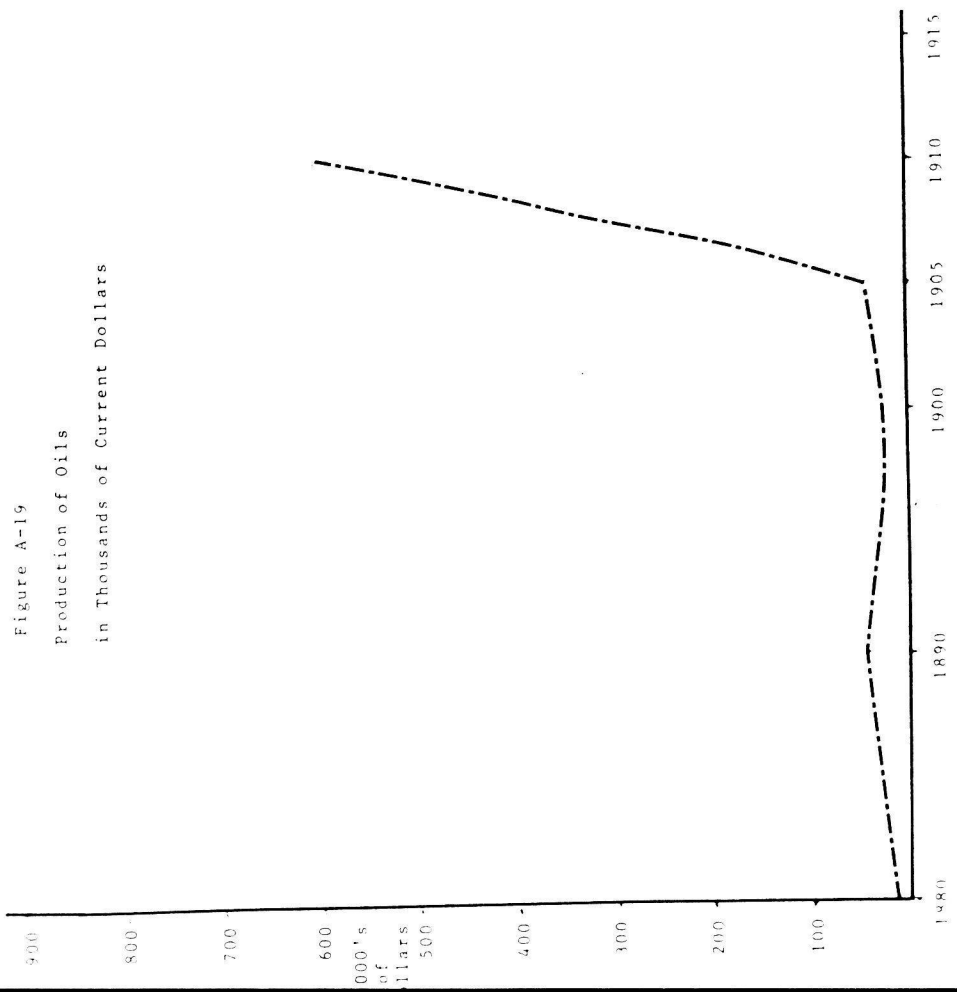


Figure A-21

Production of Foundries/Machine Shops
in Thousands of Current Dollars

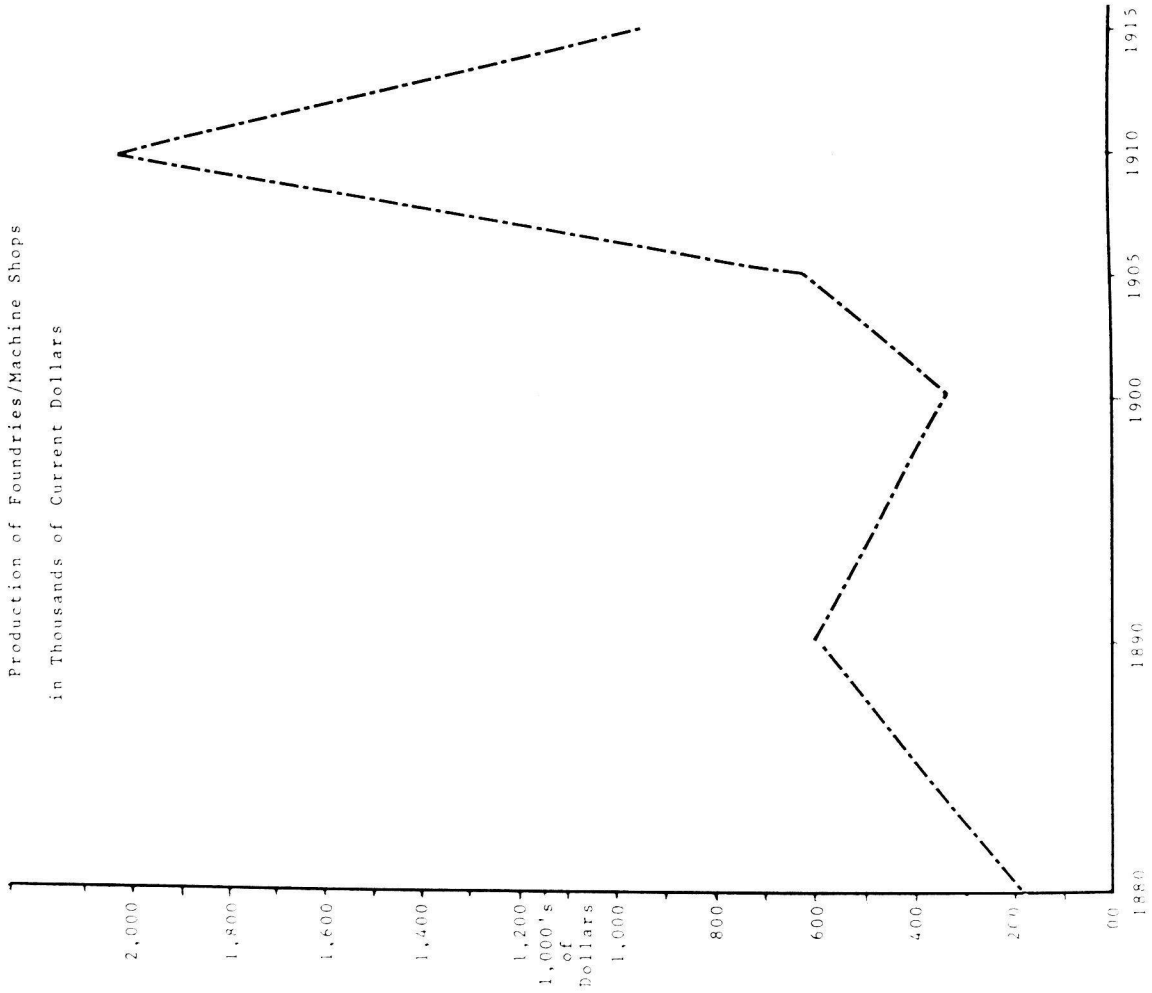


Figure A-22

Production of Tinsmith/Plumbing/Gasfitting
in Thousands of Current Dollars

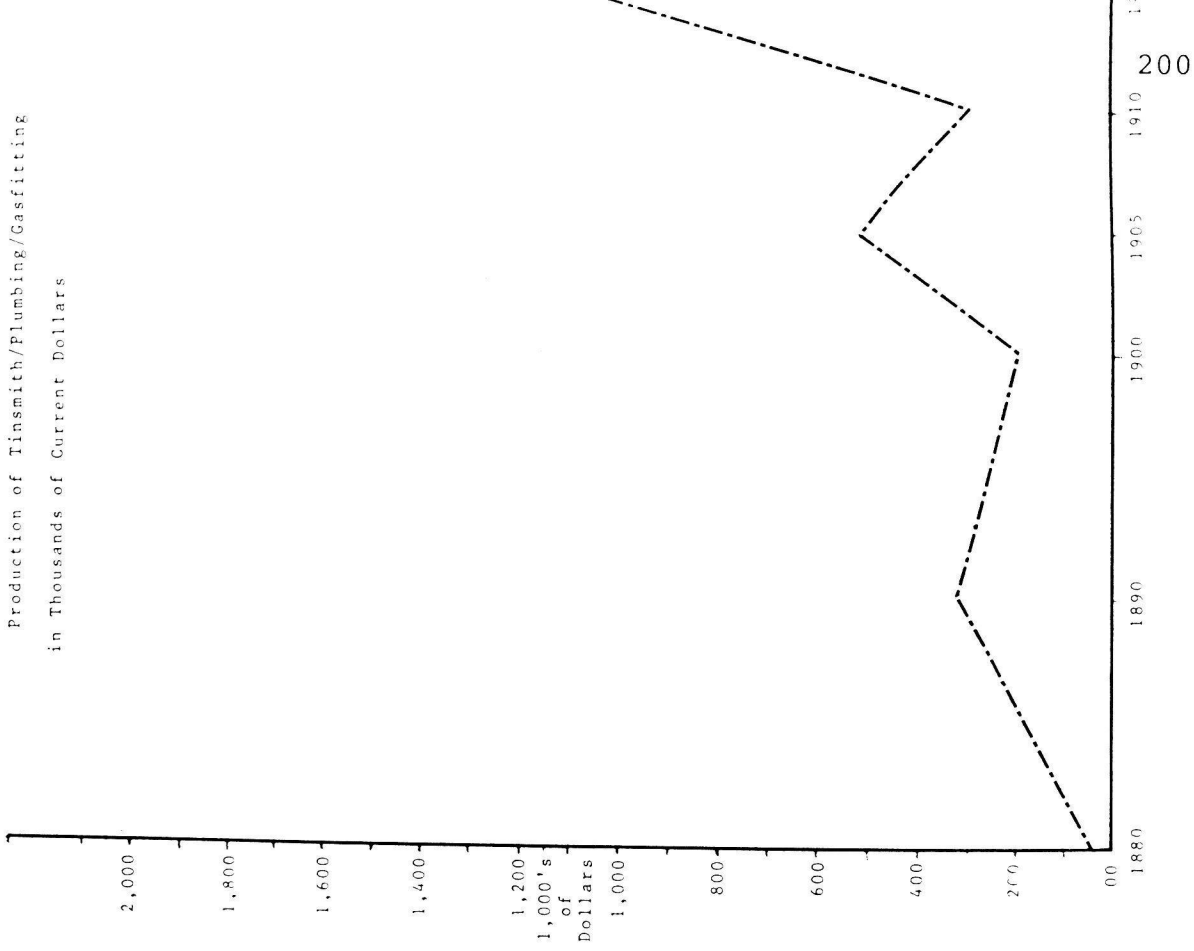


Figure A-23

Production of Ships/Boats & Repairs
in Thousands of Current Dollars

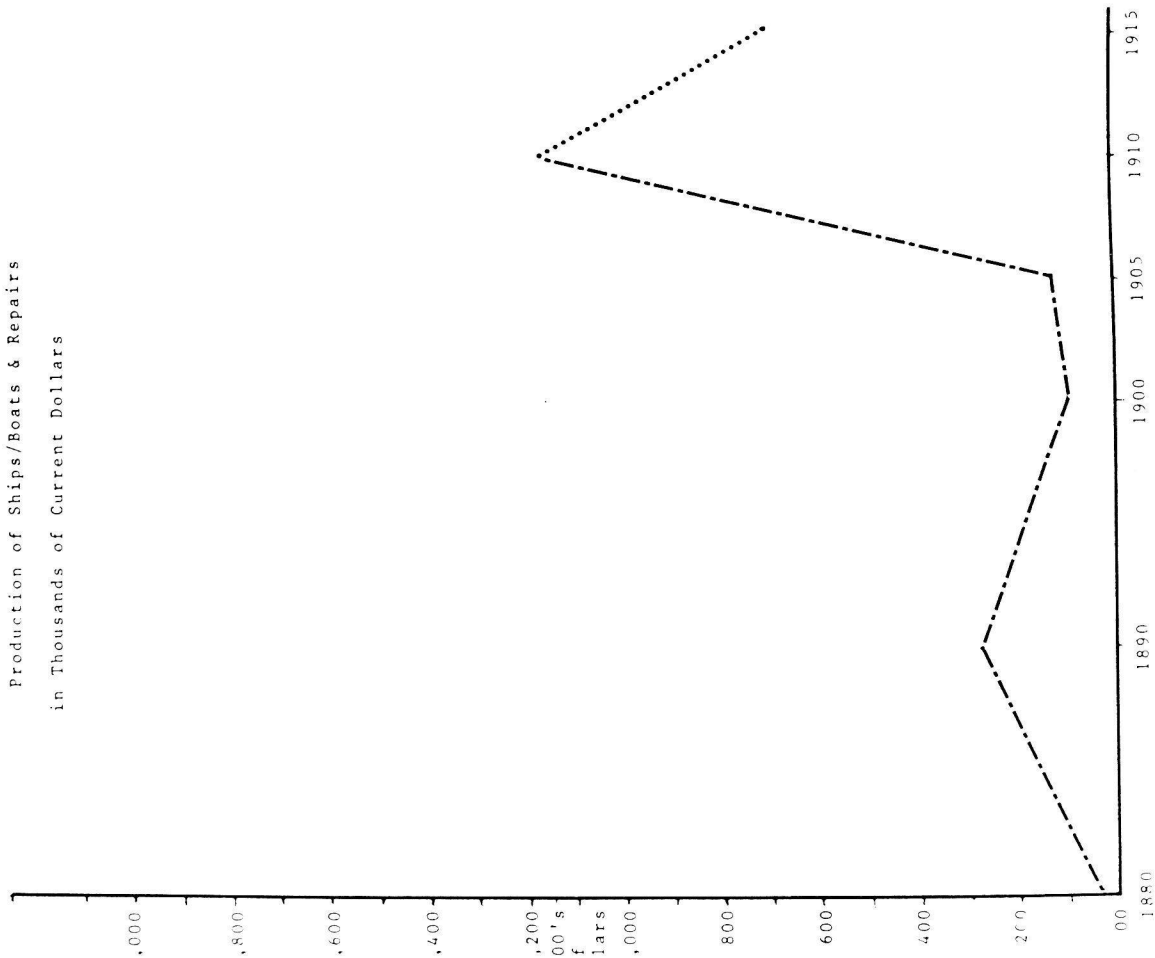
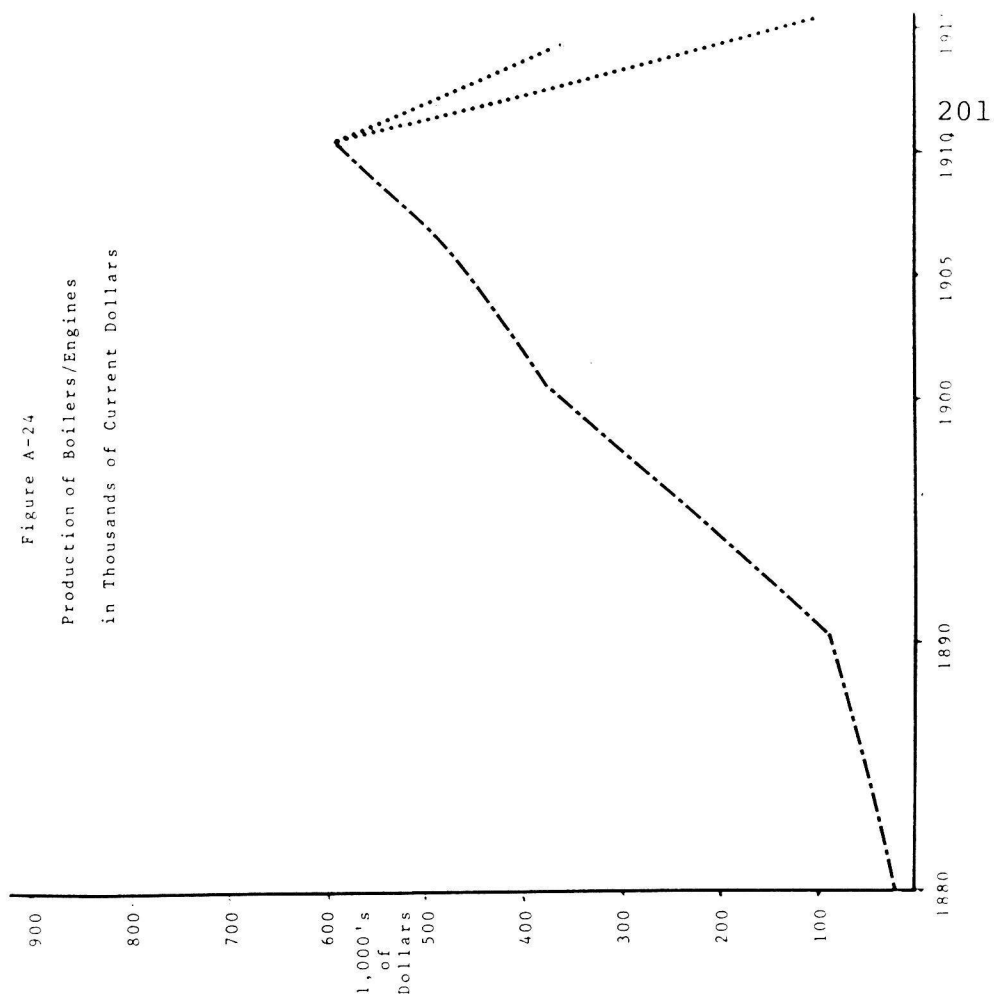


Figure A-24
Production of Boilers/Engines
in Thousands of Current Dollars



Appendix 7 Interpretation of Current Dollar Values

This appendix considers the difficulties of comparing dollar values over 55 years owing to inflation/deflation and considers the effects of general price trends on the interpretation of data provided in this thesis.

The main difficulty of using dollar values as a measure of output over time is that it is not a consistent measure. The value of one dollar changes over time and as a result, so does the output it represents. If the value change is significant the dollar is not a standard basis of comparison unless we adjust dollar values themselves to a common standard. The usual method of coping with this problem is to create price indices which establish the value of the dollar in different time periods based on how many dollars it takes to purchase a given bundle of goods.

There are two main difficulties in applying this approach to the data in this thesis. First, there is no good general index for manufactured goods in British Columbia or Canada during the period under consideration. Second, the indices that might be used as proxies, for example the wholesale or export price indices are heavily or exclusively weighted towards prices prevailing in eastern Canada. At present there is no way of determining the extent of price differences between British Columbia and the rest of the country although the evidence suggests that a dollar bought less in British Columbia than elsewhere.¹⁷ Due to these difficulties no attempt was made to adjust the time series data presented in this thesis by any of the published indices. The published indices do however, provide a guide to the interpretation of this data and allow an indication of biases inherent in the production values and in some cases these are quite significant.

The price indices assembled by Urquhart & Buckley and the Dominion Bureau of Statistics/Statistics Canada are consistent for this era in terms of direction of price trends but vary in magnitude.¹⁸ The general trends are visible in Figure A-25. Between 1880 and 1890 Urquhart & Buckley's general wholesale price index shows a deflation of 4-6% (J33)¹⁹ The wholesale foodstuff index (J165) and Mitchell's general wholesale index (J1) show 11% deflation.

The deflationary trend continued through the next decade, 1890-1900. Urquhart & Buckley's general wholesale index (J33) shows a deflation of 5-7%; the food wholesale index (J165) a deflation of 6%, and Mitchell's wholesale index (J1), 3%.

¹⁷ For example it bought less labour (see Table 22 and Figure 12); There are some comparative statistics for consumer prices 1900-1915 which show the higher cost of living in British Columbia; Canada, Department of Labour, *Wages and Hours of Labour in Canada, 1901-1920*, Report No. 1 (Ottawa: Issued as a supplement to *Labour Gazette*, March 1921); and Canada, Board of Inquiry into Cost of Living, *Report of the Board*, (Ottawa, 1915) Vol. I, pp. 558-590.

¹⁸ M.C. Urquhart & K.A.H. Buckley, *Historical Statistics of Canada*, (Cambridge, Toronto: Cambridge University, MacMillan, 1965); all the subsequent references to Urquhart & Buckley refer to this 1965 edition.

¹⁹ This and subsequent reference numbers refer to data series in Urquhart & Buckley. In Series J33 the years 1935-9 are used as basis for index and the 4% estimate is on that basis; using an 1880 base yields the second estimate, 6%; All the other series mentioned below use 1900 as the base year with the exception of Figure A 25 which uses 1913.

Inflation of between 8 and 12% set in between 1900-1905 according to Urquhart & Buckley's wholesale index (J33). Mitchell's wholesale price index (J1) estimates climbed 6% while the food index (J165) show 17% inflation.

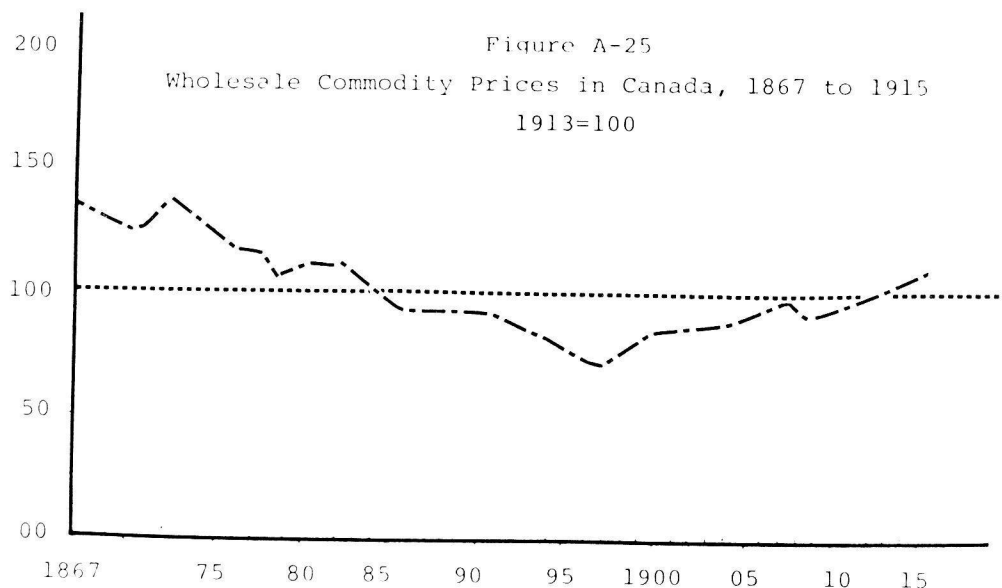
Prices rose even faster in the next five years, 1905-1910. Urquhart & Buckley (J33) show an inflation over this period of between 8 and 12%. Mitchell (J1) of 12% and the wholesale food index (J165) of 24%.

The Canadian inflationary trend continued between 1910 and 1915. Urquhart & Buckley (J33) estimate inflation ran at 13-17% while Mitchell's estimates (J1) 24%. The food index (J165) series ends in 1913 showing an inflation of 5% over the three years.

In Chapter 7 the time series data for products of the metal and boiler industry exhibit the same overall trend but the price fluctuations are not so wide. The Department of Labour metal implement price index (J24) shows a deflation of 4% between 1890 and 1900, inflation of 6% to 1905, deflation of 2% to 1910 and inflation of 8% to 1915 (see also J10 and J40).

In terms of interpreting the time series data in Tables 3, 4, 5, 10 and 12, the figures for 1890 should be considered an underestimate of 4 to 10 % relative to 1880. Adjusted for this deflation the census figures would show more growth in the manufacturing sector and thereby further substantiate the thesis's argument that there was substantial manufacturing growth in this period. The 1900 figures also underestimate manufacturing growth over the decade 1890-1900 by between 3 and 7%. Adjusting for this improves the apparent performance of the British Columbia economy over the decade but not significantly.

Between 1900 and 1915 the value of the dollar diminished substantially so the estimates for 1905, 1910 and 1915 actually overestimate the growth of the economy relative to 1900. The value of the dollar in 1905 was very close to what it was in 1880 so these two figures are roughly comparable. Over the decade 1900 to 1910 price inflation ran between 10 and 36% depending on the index and this inflation accounts for some the apparent expansion in manufacturing that occurs in this period. Finally, in the five years 1910-1915 inflation was also running at 6-17% over the period so the apparent slow growth of the manufacturing economy may even have been a decline in real terms. Adjusting for inflation in the 1900-1915 era would not substantially alter British Columbia's manufacturing production relative to the rest of Canada but it would exacerbate the apparent overall decline in manufacturing production demonstrated in this thesis.



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